



What motivates Vietnam to strive for a low-carbon economy? – On the drivers of climate policy in a developing country



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ABSTRACT

Though climate change is an urgent problem especially for vulnerable developing countries, international negotiations are in a gridlock. Standard game-theoretic models that describe climate change mitigation as a public good problem predict few incentives for individual countries to act. Nevertheless – despite the absence of a globally binding agreement – we can observe some developing countries launching unilateral climate policies. Being one of those, Vietnam has recently announced to strive for a low-carbon economy. Based on interviews with Vietnamese policy makers and other stakeholders, this explorative case study examines Vietnam's motivation for a policy change that has shifted from emphasizing the responsibilities of developed countries for climate change towards accepting responsibility of developing countries to also reduce their emissions. While Vietnam's high vulnerability has contributed to put climate on the political agenda, the policy shift from a pure adaptation towards a mitigation focus was mainly driven by expected multiple climate policy benefits other than climate change abatement (so-called co-benefits). These include restructuring of the economy, addressing energy security concerns and accessing international finance to counteract a phase-out of conventional development assistance. Air quality considerations, by contrast, do not seem to play a major role for Vietnam's shift in climate policy.

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Introduction

In recent years high rates of economic growth in developing countries have resulted in a rapid increase of greenhouse gas (GHG) emissions (see e.g. Raupach et al., 2007; Steckel et al., 2011). As a consequence, stronger involvement of developing countries – which currently do not face binding emission reduction targets under the United Nations Framework Convention for Climate Change (UNFCCC)¹ – is regarded as essential in order to achieve ambitious climate stabilization goals (see e.g. UNFCCC, 2011).

However, from the view of standard economic theory, climate policies appear particularly unlikely to be implemented in developing countries for two reasons: first, even though there is no direct one-to-one

relationship between energy use and socio-economic development, in the past it could be observed that high levels of human development were only attained for countries that have crossed a certain minimum threshold of per-capita energy use (Steckel et al., 2013). For low income countries economic development has been closely related to successful industrialization based on fossil fuel resource use and thus rising GHG emissions (Jakob et al., 2012). Despite the deficiency of GDP and energy growth in reflecting improvements in human development (see e.g. Rao et al., 2014), many countries suspect that climate change mitigation could adversely affect development objectives (Jakob and Steckel, 2014) thereby providing a clear disincentive for developing countries to reduce their emissions. Second, mitigating global climate change is generally perceived to raise a collective action problem that requires a global solution. Conventional collective action theory usually regards climate change mitigation as a global public good. In the respective models a country's benefits from avoiding one's own climate damages do not suffice to incentivize this country to bear the costs related to climate change mitigation efforts as damages suffered by the rest of the world are not internalized in its decision on how much to emit. Consequently, such models predict a pronounced incentive to free-ride on others' abatement without reducing one's own emissions (Carraro and Siniscalco, 1993; Barrett, 1994). Hence, in such a setting, individual countries will not voluntarily engage in reducing GHG emissions without

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¹ According to the UNFCCC's principle of 'common but differentiated responsibilities', which acknowledges that industrialized countries are responsible for the largest share of past GHG emissions, while developing countries are expected to be affected the most by the impacts of climate change (IPCC, 2007) and have the least capabilities to adapt to them, binding emission reduction targets under the Kyoto Protocol only apply for industrialized countries and economies in transition (listed in the Protocol's Annex B).

a globally binding and externally enforced regulation (Brennan, 2009; Ostrom, 2010).

Yet, in contrast to those theoretical considerations that view mitigating climate change as the sole benefit of emission reductions, some developing countries have recently announced unilateral emissions abatement policies (see Townshend et al., 2013). Ostrom (2010) argues that this observation can be explained by benefits other than the global benefit of mitigating climate change ('co-benefits', such as energy security or reduced local air pollution) that are usually ignored by conventional game theoretic approaches to model international climate change negotiations. Policy makers will usually pursue multiple objectives, among which climate change mitigation is only one. From a climate change perspective, a co-benefit is the indirect effect of climate policy on a non-climate objective (see e.g. IPCC, 2014, WGIII, Ch.3, p.36). As a consequence, climate policy might yield benefits of a more local nature – such as increased energy security or improved air quality – that incentivize countries to engage in climate policy even without a global climate agreement. As pledges made on the international level will first need to be discussed and finally implemented and enforced on the national policy level, a better understanding of individual countries' reasons to voluntarily engage in mitigation policy would also generate important insights on how to improve global cooperation on climate change mitigation.

This study examines the underlying motivations for unilateral climate measures adopted in Vietnam. From our perspective, Vietnam constitutes a very interesting example. While it has exhibited high growth rates in both economic terms as well as with respect to GHG emissions in the last decades (see Vietnam's economic development and energy system section) it is also highly vulnerable to climate change. At the same time, it has not yet attained the same political as well as scientific attention as bigger developing countries such as China or India.

Despite the important role of developing countries for achieving a low climate stabilization target, studies examining the motivations of national climate policy making in developing countries – especially on smaller countries – are relatively scarce. Atteridge et al. (2012) examine drivers for climate policy in India on the international, national and state levels, highlighting how climate considerations are embedded in broader concerns related to national and sub-national development interests as well as foreign relations. Dubash (2013) provides an assessment of the role played by co-benefits and equity considerations in India's climate discourse and points out that energy security is a crucial driving factor behind efforts to introduce policies to reduce emissions. Escribano (2013) analyzes the interplay of divergent political, economic, social, and environmental factors driving the formulation of energy policy in Ecuador. One of the key results of this study is that Ecuador's energy policy is severely constrained by other policy objectives related to financing as well as distributional concerns. Quitzow et al. (2011) compare environmental governance (including climate issues) in India, China, Vietnam and Indonesia. They identify ambitious policy initiatives in all four countries that are, however, hampered by a lack of capacity. Recently, a selection of case studies has been conducted, summarized in Garibaldi et al. (2014), comparing and assessing mitigation action concepts of Brazil, Peru, Chile, South Africa, and Colombia. This analysis reveals how mitigation measures crucially depend on the country-specific context, such as the level of institutional capacity.

Existing studies on Vietnam have mostly focused on specific aspects. Fortier (2010) provides a procedural critique of political processes in the run-up to Vietnam's National Target Program to Respond to Climate Change (NTP-RCC). Also mainly focusing on the NTP-RCC, Zink (2013) comprehensively discusses the political and societal dimensions of climate change policy and donor involvement in Vietnam. Rodi et al. (2012) carry out a policy analysis regarding the implementation of the Environmental Protection Tax, and Coxhead and Nguyen (2011), Coxhead et al. (2013) as well as Willenbockel (2011) examine its expected macroeconomic and distributional implications with numerical

models. Toan et al. (2011) give an overview of Vietnam's energy system, provide forecasts on supply and demand, and review recent energy policies. Do and Sharma (2011) likewise review Vietnam's recent energy policy and discuss challenges faced by its energy sector. Nguyen and Ha-Duong (2009) assess the potential of renewable energy in Vietnam and discuss barriers to their diffusion, while Nguyen (2007) focuses on wind energy potentials and discusses policies to promote their uptake.

To our knowledge, there is no comprehensive assessment of recent climate policies and their underlying motivations in Vietnam to date. This is where this paper aims to make a contribution to the literature. Our policy analysis builds on 23 semi-structured qualitative interviews with Vietnamese policy makers and other stakeholders involved in the policy making process in Vietnam conducted early 2013 as well as available literature. Our interviewees include leading staff of the key Vietnamese ministries involved in the policies under consideration, i.e. the Ministries of Finance (MOF), Planning and Investment (MPI), Industry and Trade (MOIT), Natural Resources and Environment (MoNRE) and Agriculture and Rural Development (MARD), as well as associated advisory units such as the Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE) and the Central Institute for Economic Management (CIEM). Furthermore, we conducted interviews with partners from development cooperation agencies from bilateral donors (Germany's GIZ, UK's DFID, South Korea's KOICA, Japan's JICA) and multilateral donors (UNDP, World Bank, ADB) as well as with experts from the policy foundation Friedrich-Ebert-Stiftung and from one of the few existing local NGOs Climate Change Resilience Center. A list of all interview partners can be found in the Appendix. We concentrate on policies that (at least indirectly) aim to put a price on carbon or internalize technology spillovers (i.e. cost reductions due to increased uptake of a certain technology, e.g. by means of 'learning-by-doing'), as these policies are generally regarded to be essential in order to achieve significant emission reductions (Jaffe et al., 2005). These policies mainly affect the power and industry sectors, which are hence the focus of this study.²

This paper is structured as follows: First, we provide some general information about Vietnam's development, including an in-depth analysis of energy related emission drivers. Second, we introduce climate and energy related policies in Vietnam. Third, using an inductive approach, we identify and evaluate the different motivating factors to engage in climate measures mentioned in the interviews divided into domestic (e.g. vulnerability to climate change, energy security, economic growth) and external factors (e.g. donors, international setting). We continue with discussing how the observed policy change in Vietnam can be explained from the perspective of Kingdon's (1995) 'multiple streams framework' and finally conclude.

Vietnam's economic development and energy system

Since its reunification in 1976, the Socialist Republic of Vietnam is a one-party state ruled by the Communist Party of Vietnam (CPV). In the mid-1980s, the CPV launched a socio-economic reform process ("Doi Moi", literally meaning "renovation"), which allowed private entrepreneurs to participate in the market. It is usually perceived that the set-up of the "Doi Moi" process gave impetus to subsequent rapid economic growth, with GDP per capita more than tripling between 1990 and 2010, lifting a large part of the Vietnamese population out of (absolute) poverty. This was accompanied by an outstanding social transformation significantly improving important developing indicators such as life expectancy and the Human Development Index (HDI) (see Table 1). Around 2009 Vietnam has crossed the GDP threshold to be listed as a Low Middle Income country by the World Bank. At the same time, in the last two decades, inflows from net official development assistance (ODA) have played a major role for Vietnam amounting to approximately

² Though the agricultural sector in Vietnam does also play a role concerning climate change considerations, it cannot be covered in the scope of this study.

Table 1

Selected socio-economic and development indicators for Vietnam for the years 1990, 2000 and 2010.

	1990	2000	2010
Population [million]	66.02	77.63	86.93
GDP per capita, Purchasing Power Parity (PPP) [constant 2005 international \$]	905	1597	2875
Poverty headcount ratio at \$1.25 a day (PPP) [% of population]	63.7*	40.1**	16.9***
Urban population [% of total]	20.3	24.4	30.4
Life expectancy [years]	65.5	71.9	74.8
Human Development Index (HDI)	0.439	0.534	0.611
Net official development assistance (ODA) received [constant 2010 million US\$]	254	2212	2940

Sources: World Bank, 2013; UNDP, 2013. Note that for selected data points available data differ from indicated years marked by symbols: * 1993, ** 2002, and *** 2008.

3.5 billion US\$ in 2011 of which 61% stems from bilateral donors (source OECD, 2013).

Social changes shown by Table 1 are mirrored in changes in Vietnam's economy. Once being dominated by the agricultural sector it is today built on a solid industry base, with the industrial sector having grown at more than 10% per annum in the 2000s. In 2006, it became the largest sector in Vietnam's GDP (see Toan et al., 2011, for a detailed description). While in 2000 GHG emissions from the energy sector accounted for only about one third of the overall GHG emissions in Vietnam (see latest official data available), the World Bank (2011, p. 33) projects the share of the energy sector to account for three-quarters with respect to Vietnam's total emissions in 2030. In view of this it is not surprising that the World Bank study also sees the highest mitigation potential in the energy sector (World Bank, 2011).

Even though private entrepreneurship is basically allowed in Vietnam, most key industries (and in particular heavy industry) are controlled by the state. Those state-owned enterprises (SOEs) generally play an important role in the Vietnamese political process, as leading figures in these enterprises usually have strong links to the Communist Party (see e.g. Hayton, 2010 for a detailed discussion).

However, recently economic growth in Vietnam has slowed down. While the global economic crisis has impacted Vietnam's economy by decreased exports and reduced foreign direct investment (FDI) (World Bank, 2012a), the country also has to deal with an increasingly inflexible economy (due to the high share of State Owned Enterprises), and a banking crisis, impeding new investments as reported by several interviewees. Additionally, Vietnam is ranked rather low on institutional quality including relatively high indices for corruption and a low ranking for rule of law (World Bank, 2012b).

Energy demand, until the year 1990 to a large extent covered by renewable sources, mostly by traditional biomass and some hydropower, is now majorly covered by fossil fuels (particularly oil and coal) and has increased by nearly factor five since 1971. In the electricity sector the state owned utility Electricity Vietnam (EVN) controls the lion's share

of transmission, distribution and generation; in 2010 EVN accounted for about 60% of electricity generation (Do and Sharma, 2011; UNDP, 2012). Most households (>97% according to World Bank (2013) statistics) have access to electricity, and electricity prices are regulated by the national government at a level below the total costs of production (with average retail prices being at approximately .07 US\$ per kWh at the time of the interviews). Electricity prices are hence indirectly subsidized with the total amount of consumption subsidies in the electricity sector estimated to be US\$ 2.92 B or 2% of GDP and US\$ 4.12 B and 3.3% of GDP in the energy sector in 2011 (IEA, 2013; World Bank, 2013), though a UNDP study suggests that those figures might even underestimate the true value (see UNDP, 2012). Vietnam's CO₂ emissions in the energy-related sectors have increased about eight-fold between 1971 and 2010 (see Fig. 1: Development of Kaya indicators (left) and Vietnamese primary energy mix (right)), resulting in per capita emissions of 1.5 t (130 Mt CO₂ in absolute terms) in 2010.

Though there are other, non-CO₂ GHGs, especially in the waste and land-use and forestry sectors, our analysis focuses on energy-related CO₂ emissions, as it mainly addresses mitigation policies in the energy and industry sectors and CO₂ constituted 87% of energy-related GHG emissions (Socialist Republic of Vietnam – MoNRE, 2010, p.42). We believe that this approach is reasonable, as these emissions account for the largest and fastest growing share of Vietnam's total GHG emissions and offer the highest potential for low-cost mitigation (World Bank, 2011). In order to understand the drivers of Vietnam's CO₂ emissions in the energy-related sectors we present an analysis along the lines of the Kaya identity (Kaya, 1990), which decomposes CO₂ emission changes into population, GDP per capita, energy intensity of GDP (i.e. primary energy per unit of GDP), and carbon intensity of energy (i.e. CO₂ per unit of primary energy), building on IEA (2012) data. Following Steckel et al. (2011) and Hübler and Steckel (2012) we also decompose changes in carbon intensity into contributions of different energy carriers (see Appendix for methodological details). It is first useful to look at the development of key Kaya factors in Vietnam compared to other countries. Fig. 2 illustrates the development of CO₂ per capita emissions (in tCO₂), GDP per capita (in US\$), energy intensity (in MJ per US\$) and carbon intensity (in kg CO₂ per GJ) for Vietnam in comparison to China, the global average and an aggregate of other newly industrializing countries (NICs), including Brazil, India, Indonesia, Mexico and South Africa.

Per capita CO₂ emissions in the energy sector in Vietnam, despite their dramatic growth in the last two decades, still remain far below the global average and also below the average value of other NICs (Fig. 2a). However, Vietnam's carbon intensity has increased significantly in the last decades, now having crossed average levels of other NICs. Vietnam's energy system has carbonized even faster than China's, particularly in the last two decades (see Fig. 2d). In addition to that, Vietnam's energy intensity has increased slightly in the last decade and is – comparable to China's – higher than the global average. Note that we show GDP measured in PPP; when using market

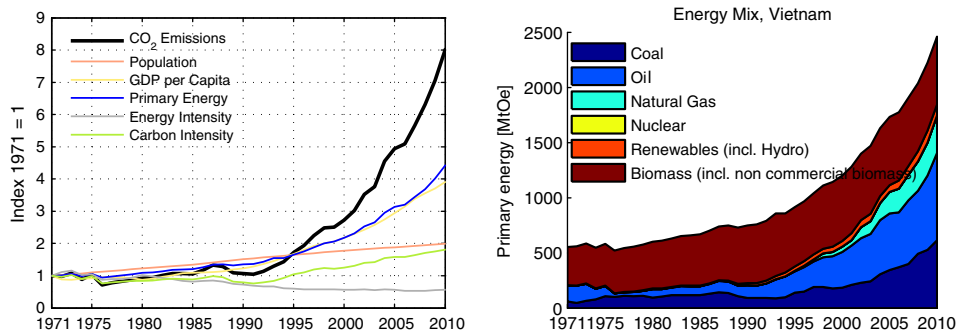


Fig. 1. Development of Kaya indicators (left) and Vietnamese primary energy mix (right). Note: For details on Kaya indicators see Appendix. 1 Mtoe = 41.868 PJ. Data Source: IEA (2012).

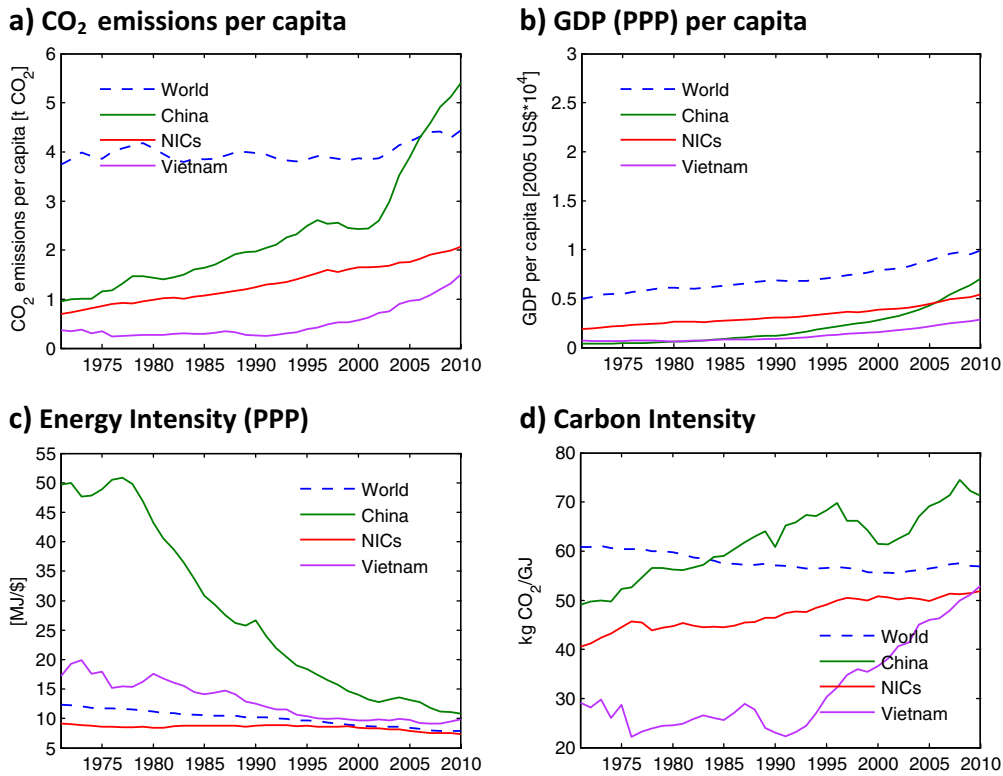


Fig. 2. CO₂ emissions per capita and factors of the Kaya identity over time for Vietnam, China, Newly industrialized countries (including Brazil, India, Indonesia, Mexico and South Africa) and the global average. Data source: IEA (2012).

exchange rates (not shown) Vietnam's level of energy intensity is nearly twice the global average and significantly higher than values given for China.

Vietnam's carbon emissions have grown by more than 10% in most years after 1990 (Fig. 3a). While before 1990 a clear singular driver of emissions cannot be identified, after 1990 economic growth and carbon intensity have driven the increase of emissions to approximately equal extents. Energy intensity and population growth have not played a continuous role for emissions growth (with energy intensity however remaining at high levels, see Fig. 3).

Large increases of carbon intensity after 1990 (see Fig. 3b) can majorly be attributed to an increased use of oil, but coal has also played a

significant role. In the last decade (2000–2010) coal is the main driver of a carbonizing Vietnamese energy system, with annual increases ranging from two to 5% per year. Even though carbonization of the energy system has slowed down, it is still very high compared to other NICs (see e.g. Steckel et al., 2011).

Available scenario analyses for Vietnam (e.g. Toan et al., 2011; Do, 2011) predict a continuation of the observed trend in the future, with energy demand increasing substantially in the upcoming decades. Total end-use energy demand is projected to rise from below 44 Mtoe (1.8 EJ) in 2010 to about 74 Mtoe (3.1 EJ) in 2020 and about 126 Mtoe (5.3 EJ) in 2030 (Socialist Republic of Vietnam – MoNRE, 2010, p.54), mainly driven by industrialization and rising household incomes. All studies expect a huge part of the demand to be covered by

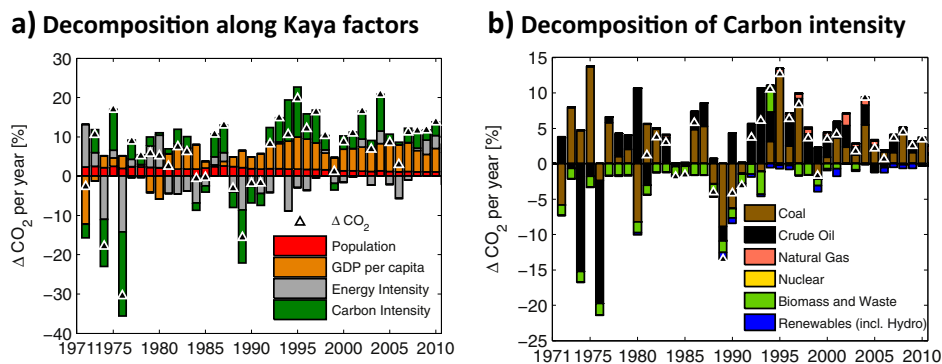


Fig. 3. Decomposition of changes in CO₂ emissions in the energy system along a) Kaya factors (left) and b) a decomposition of the carbon intensity (right). Data source: IEA (2012). See appendix for methodological details.

(carbon-intensive) coal. Even though Vietnam aims to cover some of its future electricity demand by nuclear power, emissions from its energy sector are expected to roughly double until 2020 (251 Mt CO₂e) and quadruple by 2030 (471 Mt CO₂e) (Socialist Republic of Vietnam – MoNRE, 2010, p.56).

Energy and climate policies in Vietnam

This section first provides a detailed overview of domestic climate change mitigation related policies in Vietnam, focusing on policies that either (directly or indirectly) put a price on CO₂ or support new and renewable energy policies, as these policies are generally regarded to be essential in order to achieve significant emission reductions in the long term. Second, we sketch Vietnam's position in the international context, especially its positions in the UNFCCC process. On both levels – domestic and international – we can identify a shift in how climate and energy policies are perceived and framed by Vietnam's policy makers, changing from a position emphasizing industrialized countries' responsibility for climate change to a position acknowledging Vietnam's own contribution to a changing climate, also signaling the willingness to take responsibility.

Domestic policies

'Direct' climate policies

Even though Vietnam has already been involved in international climate negotiations since the 1990s and climate change issues have been discussed nationally since the beginning of the 2000s, climate change only explicitly entered the national policy making agenda with the National Target Program to Respond to Climate Change (NTP-RCC) approved in 2008 (see Zink, 2013 for more details). Despite containing a long term component that identifies the need to develop towards a low carbon economy (NTP-RCC, 2008), the allocation of funds granted for the NTP-RCC clearly reflects its focus on adaptation by attributing only about 2% of the overall resources to mitigation activities (see Fortier, 2010). Moreover, the NTP-RCC (2008) emphasizes that mitigation actions will need to be financed externally by industrialized countries or international funds (see also Zink, 2013).

In December 2011, the Prime Minister approved the National Climate Change Strategy (NCCS). In contrast to the NTP-RCC, which defined climate change response mostly in terms of adaptation measures, the NCCS states that climate change adaptation and mitigation actions should be carried out in parallel. The NCCS defines ten strategic tasks, inter alia outlining approaches for emission reduction, in particular renewable energy and energy efficiency improvements, though not yet defining emission reduction targets for the energy and industry sector.³ However, the NCCS has confirmed and partially broadened targets from the National Energy Development Strategy of 2007 to increase the share of new and renewable energy (excluding large hydro >30 MW) in total commercial primary energy to 5% in 2020 and 11% in 2050.⁴ Additionally, a National Climate Change Committee has been established. In the NCCS, Vietnam (for the first time) signals its willingness to take responsibility for climate change caused by its own development pathway indicated by formulations such as “the global trend [...] demands every country, developed or developing, to reduce greenhouse gas emissions” (NCCS, 2011, p.2), thereby clearly marking the policy shift towards climate change mitigation.

Beyond this, in early 2012 and soon after the approval of the NCCS, the Vietnam National Green Growth Strategy (VGGS) was drafted and

approved by the Prime Minister in September 2012 (Nguyen, 2012). The VGGS – combining energy-, economic-, and climate policy (compare Table 2) – aims to “achieve a low carbon economy” (VGGS, 2012, p.2) by restructuring the economy and reducing GHG emissions. In contrast to the NCCS, the VGGS defines explicit emission reduction targets for the energy sector. While in the NTP-RCC Vietnam had conditioned any mitigation action on the financial support from abroad, it now unconditionally commits itself to reduce its GHG intensity per unit of GDP by 8 to 10% by 2020 compared to 2010 levels and to reduce GHG emissions from energy activities by 10% (additional 10% conditional on international support) below business as usual by 2020 and 20% (additional 10% with international support) in 2030 (VGGS, 2012, p.2). Importantly, “adequate funding from the state and local budgets” (VGGS, 2012, p.12) to finance the VGGS' implementation is promised. Finally, all line ministries, state agencies and regional authorities are requested to revise their strategies according to the VGGS and to develop Action Plans for its effective implementation. The Green Growth Strategy moreover announced a gradual phase out of fossil fuel subsidies (these are often imposed indirectly, e.g. by regulating end-user prices for electricity below power producers' total generation costs). UNDP (2012) provides a detailed overview on the different forms of subsidies for electricity (p.22) and refined petroleum products in Vietnam (p.24). As a first step, EVN has been granted the government's permission since 2011 to adjust electricity prices quarter-annually by a maximum of 20% per year (see also UNDP, 2012). However, first price increases realized by EVN have been only 17% on average in 2011 remaining below inflation rates and leading to decreasing real prices (see UNDP, 2012), and amounted to only about 10% in 2012. Although rates for poor households protected by a block tariff (VND 993 per kWh for the first 50 kWh, about 4.72 US cents/kWh at the time of the interviews) have not been raised, those price changes have evoked public resentment (see e.g. Anh, 2013, Tuoi Tre News, 2013, Van Nam, 2013) also due to impacts of electricity price increases on inflation (see Nguyen, 2008).

In its Green Growth Strategy Vietnam also announced plans to move towards “trading of certified greenhouse gas emissions, carbon tax and fees and levies” (VGGS, 2012, p.12). In this context, a World Bank project (“Partnership for Market-Readiness”) assesses the feasibility of several pricing instruments such as a carbon tax, sectoral crediting⁵ or an emissions trading scheme. Vietnam's interest in market-based instruments is underlined by Prime Minister Nguyen Tan Dung's approval of a plan to implement an emissions trading scheme by the year 2020 (see, e.g., Cheeseman, 2012). However, an important prerequisite for pricing emissions is a functioning monitoring, verifying and reporting (MRV) scheme which is currently lacking. In cooperation with the Japan International Cooperation Agency (JICA) Vietnam is currently working on establishing a regular GHG emission inventory, which had already been announced in the NCCS in 2011.

Vietnam's strategy for promoting renewable energy (RE) or other low carbon technologies is not concentrated in one single policy document, but has been part of several direct and indirect climate policies. So far, private investment in renewable energy has remained low as stated by several interviewees, despite the implementation of economic incentives such as a feed-in tariff for wind energy of one US cent/kWh additional to the standard electricity price for households⁶ (Socialist Republic of Vietnam, 2011b) as well as tax exemptions and preferential loans. RE lacks competitiveness inter alia due to very low prices for conventional energy and market power of SOEs. Reforms in electricity pricing and steps towards market liberalization are envisaged, which

³ However, in parallel, the Ministry of Agriculture and Rural Development (MARD) decided on a reduction target of 20% of total GHG emissions for the agriculture and rural development sector by 2020 (18.87 Mt CO₂e, see MARD, 2011), which was also confirmed in the NCCS (NCCS, 2011, p.11).

⁴ Note that use of biomass predominantly takes places in non-commercial applications, e.g. as fuel wood (Victor and Victor, 2003).

⁵ Sectoral crediting refers to a dual mechanism where developing countries adopt emission reduction targets for entire sectors and can then sell the acquired permits for those reductions to industrialized countries on carbon markets. This is in contrast to project-by-project crediting as used for the Clean Development Mechanism or other sector-specific emission reduction targets that are not related to market mechanisms.

⁶ Technically, Vietnam's feed-in tariff is in fact a feed-in premium. It is paid from the Environmental Protection Fund, financed by fees on wastewater and fines for non-compliance with environmental regulations (Interviews).

Table 2
Overview on selected recent climate and energy related policies in Vietnam indicating addressed policy fields.

Policy documents	Year of approval	Ministry in charge	Fiscal policy	Environ. policy	Climate policy		Energy policy	Economy policy
					Adap-tation	Miti-gation		
National Target Program to Respond to CC	Dec 2008	MoNRE (Nat. Res. & Environ)				●		
Law on econ. & efficient use of energy	June 2010	MOIT (Industry & Trade)					●	●
Environmental Protection Tax Law	Nov 2010 (tax: Jan 2012)	MOF (Finance)	●	●				
Master Plan for Power Develop. (VII)	July 2011	MOIT (Industry & Trade)					●	●
National Climate Change Strategy	Dec 2011	MoNRE (Nat. Res. & Environ)		●	●	●	●	
Vietnam Green Growth Strategy	Sept 2012	MPI (Planning & Investm.)	●	●	●	●	●	●

Note: dark-blue dots mark laws, lighter dots mark strategies and plans that require further implementation.

might facilitate private investments and the diffusion of renewable energy technologies (see also [Nguyen and Ha-Duong, 2009](#) for the case of wind energy). Finally, the first nuclear power plant in Vietnam is supposed to enter into operation in 2020. In 2030, 10% of electricity production is planned to be covered by nuclear power ([Power Master Plan VII, 2011](#)). The construction of several nuclear power plants is currently prepared in cooperation with Japan and Russia.⁷

'Indirect' climate policies

Before the NCCS was approved Vietnam had already launched several 'indirect' climate policies dealing with energy use and natural resources, though not mentioning climate change mitigation explicitly as an objective. Single environmental policies in Vietnam could be observed since the beginning of the *Doi Moi* process in the 1980s. Inspired by the 1992 Earth Summit on sustainability, the Vietnamese government initiated the Vietnam Agenda 21 "Strategic Orientation for Sustainable Development" in 2001, which was finalized in 2004 (see [Nguyen, 2012](#)). However, this was not seen as a major step by a number of our interviewees.

Discussed for the first time in 2004 ([Nguyen, 2012](#)), the *Environmental Protection Tax Law* was passed by the end of 2010 with the tax coming into effect in January 2012. The Environmental Protection Tax (EPT) is levied on a broad range of fossil fuels including oil products and coal ([EPT, 2010](#)). Though the EPT is also imposed on some other environmentally harmful substances such as plastic bags and pesticides it can be considered as a comprehensive energy tax (see [Rodi et al., 2012](#)). However, currently, the EPT cannot be called a climate policy instrument as tax rates disregard carbon content of taxable objects, thus potentially even leading to a shift to more carbon-intensive fuels like coal (see e.g. [Willenbockel, 2011](#)). Moreover, tax rates are currently set very low and partially substitute preexisting fees, thus the EPT is not likely to have resulted in additional incentives to reduce emissions at the current state.

In parallel, the Vietnamese government made efforts to reform the power sector by launching the *Law on Economical and Efficient Use of Energy* in June 2010 and the *National Master Plan for Power Development* (Power Master Plan VII) in July 2011. The Master Plan for Power

⁷ The construction work for the first nuclear power plants was originally planned to start in late 2014 with the first reactor coming online in 2020. However, in January 2014 a delay of about 4 years was announced, due to ongoing negotiations on financing and technology (see e.g. [World Nuclear Association, undated](#)).

Development of 2011 adds explicit targets for electricity production by envisaging a share of renewable energy sources (excluding large hydro) in total electricity production of 4.5% in 2020 and 6% in 2030, and several specific targets of capacity increase for different types of renewable energy technologies and large hydro ([Power Master Plan VII, 2011](#)).

Efforts to reform state-owned enterprises have been present before the Green Growth Strategy, independent from climate policy considerations. But, as the energy sector and in particular power generation are strongly characterized by market dominating SOEs as well as by significant subsidies for fossil fuels – mainly via government compensations for SOEs' losses due to regulated energy prices – the SOE reform is seen to play an important role for climate policy efforts. Several policy documents and strategies envisage to gradually restructure the power market, which includes transforming state-owned enterprises into shareholding companies and to eventually adapt electricity prices to long-term marginal costs ([Power Master Plan VII, 2011](#); [NCCS, 2011](#)). This has been taken up by the Green Growth Strategy announcing a gradual phase out of (indirect) fossil fuel subsidies ([VGG, 2012](#)).

[Table 2](#) gives an overview of important climate-related policies that have been passed from 2008 to 2012, indicating the ministries in charge and sketching the policy fields they mainly address. For a more detailed overview on energy policies in Vietnam see [Do and Sharma \(2011\)](#). For a more general overview on Vietnamese policies on environment and climate change see [ADB \(2013, Table 3, pp.13\)](#).

[Table 3](#) in the Appendix provides an overview on the status of measures with regard to renewable energy and pricing of emissions or fossil fuels.

International positioning

Vietnam ratified the UNFCCC in 1994 and the Kyoto Protocol in 2002 as a Non-Annex-B country, thus not facing obligations to reduce emissions under the Kyoto Protocol. In its two communications to the UNFCCC Secretariat (2003, 2010) ([Socialist Republic of Vietnam – MoNRE, 2003 and 2010](#)) Vietnam has been continuously emphasizing the UNFCCC's principle of 'common but differentiated responsibilities' stating that mainly the developed countries should take the lead in climate change mitigation efforts. In this respect, at COP 16 (2010, Cancún) the Vietnamese Delegation urged industrialized countries to make more ambitious commitments and support developing countries with climate finance and technology transfer, particularly highlighting Vietnam's high vulnerability to climate change ([Socialist Republic of Vietnam, 2010](#)).

One year later in Durban, the Vietnamese delegation decided to revise its COP 17 speech in short notice; while still stressing the 'principle of common but differentiated responsibilities', Vietnam stated that it "believes that both developed and developing countries must take further actions" ([Socialist Republic of Vietnam, 2011a, p.1](#)). Furthermore, it was announced that Vietnam takes it as its responsibility to develop a low carbon economy and has started to do so with own national resources (pointing at the NCCS approved shortly before), though hoping for further support by developed countries. This shift in discourse towards a stronger focus on emission reductions on the international level of climate policy making came as a surprise to many international donors according to some interviewees.

Vietnam's domestic policies are thus reflected in the international arena, with the National Climate Change Strategy obviously marking a turning point in the discussion. In the following section, we aim to analyze the underlying motivations for Vietnam to formulate climate policies dealing with mitigation.

Motivations for Vietnam to voluntarily adopt climate change mitigation measures

This section outlines motivations for Vietnamese policy makers to introduce policies discussed in the previous section on the basis of the

conducted interviews. The identified drivers can be differentiated in 'domestic factors' occurring *inside* Vietnam and falling into the responsibility of domestic policy, and 'external factors' being determined outside the country but relevant for Vietnam. Domestic factors include Vietnam's vulnerability to climate change, promoting economic growth and restructuring the economy, energy security issues and local air pollution. External factors include the role of other countries and donors as well as the international policy environment, i.e. international climate negotiations. Finally, using Kingdon's (1995) 'Multiple Streams Framework', we explain how a combination of changes occurring for each of these underlying motivational factors resulted in the observed policy shift towards GHG emissions mitigation plans.

Domestic factors

Vulnerability

Characterized by a long coastline where the majority of the population is located, Vietnam is particularly sensitive to climate changes that lead to intensified tropical storms and sea-level rise. These environmental changes endanger agricultural production, particularly in the Mekong delta, which is the heart of Vietnam's rice production (MoNRE, 2009; Wassmann et al., 2004). A widely cited report by the World Bank identified Vietnam as one of the most adversely affected countries for different scenarios of sea-level rise looking at a subsample of 84 developing countries and specific indicators (Dasgupta et al., 2007, 2009).⁸ Additionally, climate change induced droughts already constitute a recognizable impact for Vietnam (Cruz et al., 2007).

It is thus not surprising that climate change has received considerable attention in the media and has resulted in the formulation of policies to respond to it such as the NTP-RCC on adaptation. However, it is less clear why vulnerability to climate change should provide an incentive for Vietnam to reduce emissions. As the country's emissions only accounted for about 0.4% of global emissions in 2011 (EDGAR, 2013), any reduction would have a rather small effect on the change in global temperature and hence on the impacts of climate change borne by Vietnam. Yet, in the interviews conducted, the majority of respondents mentioned Vietnam's vulnerability as one of the main reasons for adopting policies targeted at climate change mitigation, such as the Green Growth Strategy discussed in the *Energy and climate policies in Vietnam section*. One possible explanation – which eludes empirical testing – is that policy makers have adopted mitigation measures as a kind of 'symbolic policy', in order to convey the impression that public concerns are being addressed, even if resulting policies might remain ineffective with respect to reduction of emissions and climate change impacts.

In any case it seems plausible that the country's vulnerability has played an important role in raising awareness and putting climate change on the political agenda though it seems to have not been sufficient to already trigger mitigation actions when passing the NTP-RCC at a time where most of the other factors described below have not yet constituted a major concern for Vietnamese policy makers.

Promoting economic growth and restructuring the economy

After a period of spectacular economic growth with GDP growth rates of more than 9% in some years (resulting in Vietnam's ascension to lower middle income country status in 2009, according to World Bank classifications), growth rates have decreased with the global economic crises to between 5 and 6% since 2008 (see World Bank, 2012a, 2014). Consequently, policy makers fear that the country could run into a 'middle-income trap' marked by economic stagnation after an extensive period of rapid growth, obstructing the official goal of

becoming a modern industrialized country by 2020 (SEDS, 2011). In our interviews, we found a broad agreement among respondents that maintaining economic growth is the prime objective of the Communist Party. Some interviewees also indicated that failure to achieve this aim might create public unrest, which could eventually jeopardize the Party's rule.

We also encountered a wide-spread perception that the green policies under study could actually be an important ingredient of a new 'development model' that fosters economic growth by increasing productivity through more efficient use of natural resources and the adoption of modern technologies (see Hallegatte et al., 2012). Given the considerable inefficiencies that prevail throughout Vietnam's economy – with sizable (indirect) energy subsidies handed out through state-owned enterprises by fixed prices for electricity and fossil fuels being probably the most salient examples (UNDP, 2012) – it seems plausible that a range of 'no-regret' mitigation options exist that pay off financially (at least in the long term) even if environmental benefits are not included in the calculation. This is confirmed by a recent World Bank study, which identifies a theoretical potential of reducing national overall GHG emissions referring to the reference year 2015 by up to 133 Mt CO₂-eq. below the business-as-usual projection⁹ at negative or zero costs. Of these 133 Mt CO₂-eq., 55 Mt CO₂-eq. are in the power sector, 13 Mt CO₂-eq. in industry, and 18 Mt CO₂-eq. in transportation (World Bank, 2011). In the power sector, accepting that new coal-fired power plants will be built and ensuring that these will be at least as efficient as possible is regarded as the most attractive negative cost abatement option, with some importance for new hydropower. For industry and transport, energy efficiency improvements are regarded as promising options, together with electric transport.

From these considerations the question emerges why no steps to exploit these efficiency gains, which would have saved costs and boosted economic performance, have been undertaken previously. Our interview partners repeatedly emphasized important obstacles hindering the implementation of policies to tackle no-regret options (see e.g. Staub-Kaminski et al. (2014) for a typology and discussion of such obstacles to climate policy). According to our interviews important obstacles are: first, lack of appropriate information on saving potentials and the required technologies and volumes of investment. Second, institutional and political obstacles, such as resistance by powerful interest groups. For example energy-intensive industries would face higher costs and hence lower profits if electricity was priced at its true economic cost and recent efforts to increase electricity prices have led to public opposition (see e.g. Anh, 2013; Tuoi Tre News, 2013; Van Nam, 2013). Third, lack of up-front finance to meet initial investments that would pay off over a longer time-horizon (which is especially pronounced in the current situation of high budget deficits and a looming banking crisis); fourth, a lack of capacity to draft the legal documents and administer their implementation. Moreover, at times of high growth rates and (comparably) low state budget deficits the urgency to address these barriers seemed to be less pronounced before the economic crises.

Energy security

Until today, Vietnam has covered its fossil energy demand primarily from domestic sources. But in recent years export rates have decreased (for coal and oil) or have ceased entirely (for natural gas) (see IEA, 2012). Depletion of domestic resources in combination with the projected rapid increase in energy demand is expected to turn the country into a net importer of both oil and gas in the near future (Toan et al., 2011; Nguyen and Ha-Duong, 2009) and a net energy importer by around 2015 (Do and Sharma, 2011). This anticipated development

⁸ Indicators include the percentage of land area, population, GDP, urban area, agricultural area, and wetlands affected. Note that this sample excludes most small island states, which would arguably be most severely affected by sea-level rise.

⁹ Note that this number includes CO₂ emissions unrelated to energy use (such as industrial processes and land use) and other GHGs (such as methane and NO₂). Nevertheless, as it corresponds to about 50% of Vietnam's emission projected for 2015 (compare Fig. 2 *ibid.*), this estimate should be regarded as rather optimistic.

raises significant concerns with regard to energy security (see IPCC, 2011 for different dimensions of energy security). First, several interview partners mentioned that policy makers see import dependence as exposing the country to volatility of world market prices and make it prone to disruptions of energy supply. Second, as the domestic price for fossil fuels is set below the world market price, for imports this price difference would have to be met by public sources. This would put additional pressure on an already strained government budget (in 2012, the budget deficit amounted to 3.9% of GDP, and public debt to 48.2% of GDP, CIA Factbook, 2013) and – in addition to the distortionary effects of subsidies – would redistribute money away from the Vietnamese economy to fossil fuel exporters. Hence, as repeatedly stated by our interview partners, a shift of economic activity towards less intensive energy use or substitution of fossil fuels with alternative sources of energy – such as renewables – is regarded as highly desirable from the perspective of increased energy security.

Local air pollution

The co-benefits of improved ambient air quality resulting from climate change mitigation measures have received considerable attention outside of Vietnam in the international discussion (GEA, 2012) and it is sometimes argued that these benefits could be important for deciding whether to reduce the use of fossil fuels (Nemet et al., 2010). On the Environmental Performance Index, which provides a comparison of environmental quality across countries, Vietnam ranks among the lowest ten nations in the world with regard to health-related air quality (EPI, 2012) and indeed, local air pollution was seen as a major public health problem by practically all our interview partners. Against this background, it is quite surprising that according to our interviews it did not have a major influence on the formulation and adoption of emission reduction policies outlined in the *Energy and climate policies in Vietnam section*. We did not encounter a convincing explanation why reduction of local air pollution has not received more emphasis as a reason in favor of measures to abate GHG emissions but is rather seen as an unrelated problem. Though not all climate change mitigation measures necessarily have a positive effect on air quality and not all air pollution policies necessarily lead to lower GHG emissions, several studies argue that addressing climate change and air pollution jointly by means of integrated policies results in lower overall costs than addressing both separately (see e.g. McCollum et al., 2011). Interviewees stated that the role of benefits from reduced air pollution should be discussed more prominently in debates on climate change abatement in Vietnam as this co-benefit could also bear potentially high incentives for additional emission reductions.

External drivers

The role of other countries and donors

Arguably, policy formulation in one country can be influenced by policies that have previously been adopted in other countries by what Steinberg (2003) describes as policy transmission or translation. Several interviewees highlighted South Korea, a country pursuing sustainable socio-economic development within its National Strategy for Green Growth (see e.g. OECD, 2010), to serve as a role model for Vietnam with respect to becoming an industrialized country by 2020 (SEDS, 2011). Yet, it should be noted that at the time of adopting its Green Growth Strategy, South Korea had already achieved high-income status. Even though these experiences cannot be directly transferred to Vietnam and might not even have been decisive for Vietnam's decision to pursue unilateral climate measures, our interview partners repeatedly mentioned that policies in other countries had an influence on the choice of specific policy instruments (e.g. a pollution tax, or feed-in tariffs for renewable energy). This is corroborated by the fact that prior to implementation Vietnamese officials embarked on extensive fact-finding missions to learn from other countries' experiences (Interviews). According to one high-ranking Vietnamese

official, "Vietnam tries to learn from other countries but does not copy anyone".

Further, as mentioned in most interviews, Vietnam's economy is to a certain degree dependent on official development assistance (ODA) from bi- and multilateral donors. In recent years, ODA accounted for up to 15% of the government budget (Interviews) and about 3% of GDP (World Bank, 2013). With Vietnam having achieved low-middle income status in 2009, some donors have announced their intent to reduce their activities in or completely withdraw from Vietnam in all but few selected areas (e.g. the UK's Department for International Development (DFID)) will exit Vietnam in 2016; see DFID (undated). In parallel, several interview partners emphasized that donors' aid portfolios have increasingly shifted their focus towards sustainable development and Green Growth, so that Green Growth has become more attractive for Vietnam as a new opportunity to preserve access to international financial support as well as technical assistance.

Cooperation with donors seems to be perceived as a means to tackle some of the obstacles to reaping negative-cost options, e.g. by providing access to new technologies for power production or advising in the implementation of energy efficiency measures. That is, by carrying out workshops and background studies, donors helped to put climate change on the political agenda and assisted in building capacities required for formulating strategies and objectives as well as designing policy instruments. For instance, the United Nations Development Program (UNDP) has supported Vietnam with detailed studies identifying the structure and amount of fossil fuel subsidies as well as potentials to reduce them and also provided advice in drafting the VGGs. Further, Germany's agency for international cooperation ("Gesellschaft für Internationale Zusammenarbeit", GIZ) provided advice on the Environmental Protection Tax and on feed-in tariffs for renewable energy (see GIZ, undated). Finally, cooperation with donors is also regarded as a potential means to spur technology transfer and thus to help modernizing the economy (Interviews). As a consequence, cooperation with donors on Green Growth policies is often evaluated to provide significant benefits with little or no associated costs or risks. Several interviewees saw an important role for development assistance in further identifying co-benefits and removing barriers for specific policies.

The international policy environment

Regarding global climate negotiations, several Vietnamese policy makers interviewed mentioned "to take responsibility" and "to contribute to global efforts against climate change" as enshrined in the VGGs and the NCCS as a motivation for climate policy. Some interviewees pointed out that by being a front-runner Vietnam might also motivate other countries to follow its example and pledge to reduce emissions. However, they also stated that this was not a major motivation for Vietnam to put forth green policies as it perceives itself as a too small player to influence others' behavior.

It seems more plausible that, as stated by several of our interlocutors, a strong impression of a 'first mover advantage' in attracting climate finance prevails among Vietnamese policy makers. That is, it is widely presumed that countries that are first to put climate policies on the table will attract a more than proportional share of the financial resources available for climate change mitigation. In particular, Indonesia, the Philippines, and Thailand were frequently mentioned to compete with Vietnam for climate finance. Not surprisingly, climate finance plays a central role and policy makers are exploring means to mobilize resources via several avenues, or, as one official put it: "Vietnam is trying to keep all options open". The Green Climate Fund seems to be regarded as the most promising source, and first steps to develop frameworks for 'nationally appropriate mitigation actions' (NAMAs) have been undertaken. As stated in the Copenhagen Accord, NAMAs require the government of the recipient country to assess financing needs, possible barriers, and policy measures towards a low-carbon growth strategy that is in line with overall development objectives (see UNFCCC, 2009). The Prime Minister's announcement to

implement an emission trading scheme by 2020 suggests that Vietnam takes preparatory steps to obtain finance from selling emission permits on either a global carbon market or by linking its emission trading system to other countries' domestic markets. The fact that climate finance from international sources is predominantly geared towards mitigation yields some explanatory power for the recent shift from adaptation to a strategy including mitigation and adaptation mentioned above.

Finally, some interviewees highlighted that constructive engagement in the arena of international climate change mitigation is seen to contribute towards establishing a good international reputation for Vietnam as a 'reliable partner' in the region, which could then have positive spillovers to other policy arenas, such as trade negotiations or investment treaties (See [Rose and Spiegel, 2009](#) for a theoretical model). According to our interviewee Koos Neefjes from UNDP, this is in line with Vietnam's aim to be perceived as showing commitment and contributing to global efforts to tackle climate change. From this perspective, it also seems likely that efforts to address energy subsidies in Vietnam (see [Energy and climate policies in Vietnam section](#)) have been strengthened by the renewed interest on energy subsidy reform on the international level (e.g. [G20, 2010](#); [IEA, 2011](#)).

Understanding the policy change

Many of the negative-cost options seem to have been prevailing already some time before Vietnam decided to engage in climate change mitigation. So the question arises what were the reasons for the sudden shift in Vietnam's national climate policy as well as international positioning concerning the willingness to take over responsibility in climate change mitigation efforts. This sub-section analyzes changes in underlying motivational factors along the lines of [Kingdon's \(1995\)](#) 'Multiple Streams Framework' that in combination serve to explain the shift in Vietnam's climate policy towards engaging in emission abatement.

[Kingdon \(1995\)](#) identifies three streams – 'problems', 'policies', and 'politics' – that in combination determine policy formulation. Problems are conditions identified by policy makers or the public as issues that need to be addressed. Policies are political ideas that could serve as potential solutions that need to be tested for feasibility in the national context. Politics describe factors as party ideology or the national mood. To explain policy change one needs to understand developments in each single stream as well as their interplay.

The problem stream predominantly contains factors that according to our definition are labeled as domestic. In response to a number of international reports ([Stern, 2007](#); [IPCC, 2007](#); [Dasgupta et al., 2007](#)), climate change impacts, in particular sea-level rise, have been lifted high on the Vietnamese political agenda. The adoption of the [NTP-RCC \(2008\)](#) as well as a [MoNRE \(2009\)](#) report on vulnerability to sea-level rise can be seen as a direct reaction to them. In parallel, economic growth slowed down significantly as a result to the global economic crisis (from around 8% per pre 2007 to 5% in 2009, [World Bank, 2013](#)) and structural deficits of the Vietnamese economy (including inefficiencies of domestic industrial production, price controls, and a high share of SOEs) were increasingly recognized as obstacles to economic development, however difficult to overcome due to political economy reasons. With domestic fossil energy resources becoming increasingly scarce and estimates predicting that Vietnam will turn into a net-importer of fossil energy carriers in the near future, additional concerns arose with respect to energy security especially in view of the expected increase in energy demand. At the same time, increasing budget deficits of up to 8% of Vietnam's GDP in 2010 (see [ADB, 2011](#)) put additional pressure on the high subsidies on fossil fuels and decreased the tolerance for loss-making SOEs. Finally, with Vietnam achieving lower middle income status in 2009 while still being

highly dependent on ODA, policy makers needed to deal with a gradual phase out of 'conventional' ODA.

Given these pressing problems, Vietnamese policy makers were searching the policy stream for potential solutions, which are mainly related to factors that we label as external. Donors supporting the policy process in Vietnam have proposed different ideas, which were then examined for their feasibility in the national context. Furthermore, Vietnamese policy makers have observed Green Growth implemented in some neighboring countries (particularly South Korea) as a reaction to the global economic crisis. So-called 'policy entrepreneurs' ([Kingdon, 1995](#)) from important donors like UNDP and World Bank revealing existing 'no-regret' mitigation potentials while offering support to overcome barriers have potentially stimulated the adoption of the Green Growth Strategy in Vietnam (interviews). Against this background, the Vietnamese government identified Green Growth as a new potential policy to address several problems at once while – at least at first glance – dissolving the trade-off between economic development and environmental protection. As some important donors had furthermore announced to restructure their aid portfolios towards mainstreaming environmental and climate change issues, the available choice set has further shifted towards greener solutions. Finally, realizing that focusing on adaptation in international negotiations has not attracted significant funding from international sources, Vietnamese policy makers seem to perceive mitigation actions to be more promising in that respect, i.e. "the money does not lie in adaptation but in mitigation", as one interviewee put it. Arguably, this shift has been accelerated by a perceived first mover advantage for potential recipients of climate finance.

The adoption of climate change mitigation policies was furthermore supported by favorable conditions in the politics stream. Policy makers (including the government and the CPV) seem to have become apprehensive of people becoming increasingly discontent due to the economic situation but also to increasing environmental degradation and exposure to climate change impacts. Interviewees also mentioned an increasingly negative attitude of the people towards badly managed state-owned enterprises and corruption.

The considerations above suggest that Vietnam's policy change cannot be explained by a change of any single motivational factor; rather, it seems likely that their interaction has opened a 'window of opportunity' – a 'problem-window' in the words of [Kingdon \(1995\)](#) – for policy change. Being increasingly concerned of being stuck in a middle-income trap, a high budget deficit, fundamental structural problems of its economy, its high dependence on ODA as well as increased awareness of climate issues, Vietnamese policy makers seem to have been exposed to increasing pressure to find policies as potential solutions. Therefore, it seems likely that they have perceived Green Growth and climate change mitigation policies as a way to modernize the economy and to gain access to funding, technology and capacity building from donors. That is, the impression conveyed in the interviews strongly points in the direction that the main benefit expected to result from green policies is not seen in improved environmental quality or avoided climate change, but rather in an improved growth performance; thus, emission reductions are seen to be a co-benefit of these policies instead of the other way around. Given the sizable potential for efficiency improvements in the industry and power sector, it seems plausible that at least some negative-cost mitigation options exist that would indeed decrease emissions while at the same time raising economic output.

Discussion and conclusions

Vietnam has recently announced and partially implemented a variety of policies relevant to climate change mitigation. If avoided climate

damages were the only benefit of these policies, as it is frequently assumed in game-theoretic models analyzing incentives for collective action to contribute to a public good, this observation would come as a surprise. Though Vietnam's stake in mitigating climate change is high due to its considerable vulnerability, standard collective action theory predicts that without a globally binding and externally enforced regulation Vietnam has few incentives to engage in climate policy, as unilateral emission reductions would have only little effect in reducing climate change impacts due to its relatively small share in current global emissions.

Yet, as pointed out by Ostrom (2010), unilateral climate policies, such as those recently adopted or announced in Vietnam, can be understood by taking multiple levels of policy making and additional benefits of emission reductions into account. From this perspective Green Growth is regarded as a means to address issues such as declining rates of economic growth, restructuring the economy, addressing energy security concerns and accessing international finance at the same time. Emission reductions per se do not seem to be a major goal of the policies but rather a co-benefit of policies aiming to promote other goals in the first place, as it has also been done by some industrialized countries before (see Rabe et al., 2006).

From a pure climate perspective the important question is not only *why* emission reductions are decided by policy makers, but also *whether* they will actually be realized. Though it is too early to evaluate the effectiveness of the discussed policies, some remarks on this can already be made. First, targets for energy sector emissions are either formulated in relative terms in the form of emission intensity targets or in absolute terms compared to a business-as-usual (BAU) scenario based on projections of (growing) emissions. Second, the majority of the policies under consideration are so far only strategies or envisaged measures whose realization yet remains to be seen. The few climate relevant policy instruments that are already implemented, like the Environmental Protection Tax and the feed-in tariff for wind power, can currently be expected to result in relatively small emission reductions compared to the BAU if any. Therefore, the question whether Vietnam has serious ambitions to reduce its emissions by implementing the announced more ambitious climate policy targets and instruments in the near future will be decisive.

Given that emissions from energy activities are expected to roughly double by 2020 and quadruple by 2030 compared to 2010 levels (see Socialist Republic of Vietnam – MoNRE, 2010) it is obvious that even if the higher-bound reduction targets of 20% in 2020 and 30% in 2030 compared to BAU will be achieved, the result will still be a substantial increase in overall emissions compared to today's level. Yet, even though they may be considered to be of a limited extent, they very likely represent real reductions compared to BAU that contribute towards climate change mitigation and that would likely not be realized without the corresponding policies in place. Especially in view of the considerable negative-cost or low-cost mitigation options identified by the World Bank (2011), the potential for emission reductions seems to be significant and yet mostly untapped. Additionally, while most measures have been formulated as abstract strategies whose translation in concrete policies is still underway, they have established legal and institutional structures such as the Committee on Climate Change that can serve as foundations for further efforts and enhance coordination between ministries. The same holds for the EPT that had originally been formulated to mainly address the waste of resources and local environmental degradation. Resistance from industry and general concerns that the tax would further burden the already ailing economy and spur inflation led Vietnamese policy makers to finally decide on low tax rates when the tax entered into effect in January 2012. Yet, the EPT and Power Sector Reform plans can be seen as a basis for the future implementation of the VGGS. However, as Vietnam's main

motivation seems to be reaping ancillary benefits not directly related to climate change mitigation, it is unlikely that it will go beyond those 'low hanging fruits' in its emission reduction efforts. Consequently, from a global perspective Vietnam's ambitions are clearly insufficient to prevent dangerous climate change. Yet, as stated above, it should not be taken for granted that the stated low or negative cost mitigation options will be exploited automatically, as this has not been happening in the past in the absence of those policies.

Eventually, there are numerous factors that will be crucial for the success of these policies. First, profound reforms announced in the electricity market, particularly with respect to pricing structures, are at the heart of a potential success. It is difficult to judge from the outside how different forces in Vietnam and its Communist Party will react to electricity price increases and resulting cuts in (indirect) subsidies. The fact that EVN does not take full advantage of the maximum price increases for electricity permitted by the government may be regarded as an indicator for increasing internal debates and fear of spurring inflation. Second, the reform of SOEs might raise distributional conflicts. Whether party cadres that profit from the current system will follow the party leadership, which seems to be committed, remains to be seen. Even though the balance of power between different coalitions of interest groups within the Communist Party is hard to assess from the outside, major reforms have proven possible in the past (cp. Hayton, 2010). It remains to be seen, whether the pressure on Vietnamese policy makers facing the high budget deficit, a banking crisis and stagnating growth rates will be sufficient to push through the necessary reforms despite the resistance of powerful interest groups.

Given the opportunity to exploit negative cost options, address multiple goals, and realize potential co-benefits, Vietnam seems to have a serious interest in putting its announced climate policies successfully into practice. This is for example indicated by the regular meetings of the newly established Committee for Climate Change, which consists of high ranking representatives of all involved ministries. Furthermore, the party resolution on climate change (Central Committee of CPV, 2013) approved in April 2013 signals that the Communist Party has codified the importance of climate change and environmental policy. In a newspaper interview the Director General of ISPONRE, Nguyen Van Tai, states that the "resolution is among the highest-level political documents in Vietnam in the way that it sets out the direction that all the relevant laws and policies have to abide" (Viet Nam News, 2013). Moreover, first steps concerning the implementation of the Green Growth Strategy have recently been made by the approval of the National Action Plan on Green Growth in March 2014, confirming among other things that state budget will be allocated to most of the planned activities.

There are reasons to believe that there is a serious interest by Vietnam's policy makers to transform their announced strategies into binding national laws even if this is mainly motivated by non-climate objectives such as access to finance and economic restructuring. Even though we argue in this paper that it has been the combination of country specific conditions leading to the adoption of climate change mitigation policies in Vietnam, some general insights could still be applicable to other developing countries facing similar issues. Taking multiple objectives and potential co-benefits into account could increase the willingness of other developing countries to voluntarily engage in mitigation actions even without a global agreement. As a consequence, a major task for international climate policy will be to identify how climate policies would affect different countries' objectives and their motivations to adopt climate measures. In particular, international donors could strengthen voluntary climate policies in developing countries by supporting them to overcome barriers for exploiting negative cost options and raising awareness for potential co-benefits. Such measures could in

the short- and medium-term help to dampen the expected steep increase in these countries' emissions, while in the long-term they could provide a basis to establish a more wide-ranging global cooperation in order to achieve a comprehensive climate agreement.

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Appendix A. List of abbreviations

ADB	Asian Development Bank
BAU	business-as-usual-scenario
CIA	Central Intelligence Agency
CIEM	Central Institute for Economic Management
CO ₂ eq	CO ₂ equivalents
COP	Conference of the Parties
CPV	Communist Party of Vietnam
DFID	UK's Department for International Development
EDGAR	Emission Database for Global Research
EJ	Exajoule
EPI	Environmental Performance Index
EPT	Environmental Protection Tax (see EPT, 2010)
Eq.	Equation
ESMAP	Energy Sector Management Assistance Program
EVN	Electricity Vietnam
FDI	Foreign direct investment
GDP	Gross Domestic Product
GEA	Global Energy Assessment
GHG	greenhouse gas(es)
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German International Co-operation Agency)
IEA	International Energy Agency
IMHEN	Vietnam Institute of Meteorology, Hydrology and Environment
IPCC	Intergovernmental Panel on Climate Change
ISPONRE	Institute of Strategy and Policy on Natural Resources and Environment
JICA	Japan International Cooperation Agency
KOICA	Korean International Cooperation Agency
MARD	Ministry of Agriculture and Rural Development
MCC	Mercator Research Institute on Global Commons and Climate Change
MOF	Ministry of Finance
MOIT	Ministry of Industry and Trade
MoNRE	Ministry of Natural Resources and Environment
MPI	Ministry of Planning and Investment
MRV	monitoring, verifying and reporting
Mtoe	million tons of oil equivalent
NAMA	nationally appropriate mitigation actions
NCCS	National Climate Change Strategy (see NCCS, 2011)
NEDS	National Energy Development Strategy (see NEDS, 2007)
NIC	newly industrializing countries
NTP-RCC	National Target Program to Respond to Climate Change
ODA	official development assistance

OECD	Organization for Economic Co-operation and Development
PIK	Potsdam-Institut für Klimafolgenforschung (Potsdam Institute for Climate Impact Research)
PJ	Petajoule
Power Master Plan VII	Master Plan for Power Development VII (see Power Master Plan VII, 2011)
PPP	Purchasing Power Parity
RE	Renewable energy
SEDS	Vietnam's Socio-Economic Development Strategy for the Period of 2011–2020 (see SEDS, 2011)
SOEs	State-owned enterprises
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
VGGS	Vietnam National Green Growth Strategy (see VGGS, 2012)

Appendix B. List of interview partners

Institution and Position of Interviewee	Date of Interview
<i>Policy Advisor Climate Change</i> UNDP Vietnam	26/02/2013 and 12/03/2013
<i>Advisor Sustainability Program</i> Friedrich-Ebert-Stiftung in Vietnam	27/02/2013
<i>Vice-President</i> Central Institute for Economic Management (CIEM), associated with MPI	28/02/2013
<i>Director of Environment Tax and Charge, Fee Policy Division</i> Ministry of Finance	04/03/2013
<i>Director</i> Climate Change Resilience Center	04/03/2013
<i>Chief Technical Advisor of Macroeconomic Reform Program</i> Gesellschaft für Internationale Zusammenarbeit (GIZ) [German International Cooperation]	04/03/2013
<i>Deputy Resident Representative</i> Korean International Cooperation Agency (KOICA)	05/03/2013
<i>Director General</i> Ministry of Planning and Investment (MPI), Department of Science, Education, Natural Resources and Environment	06/03/2013
<i>Technical Specialist on Climate Change and Sustainable Development</i> UNDP, MPI/UNDP Sustainable Development and Climate Change project	06/03/2013
<i>First Secretary, German Development Cooperation</i> Embassy of the Federal Republic of Germany, Hanoi	06/03/2013
<i>Deputy General Director</i> Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE)/Ministry of Natural Resources and Environment (MoNRE)	07/03/2013
<i>Head International Cooperation Division</i> Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE)/Ministry of Natural Resources and Environment (MoNRE)	07/03/2013
Vietnam Institute of Meteorology, Hydrology and Environment (IMHEN)/ Ministry of Natural Resources and Environment (MoNRE)	07/03/2013
<i>Country Director</i> GIZ Office Hanoi Gesellschaft für Internationale Zusammenarbeit (GIZ) [German International Cooperation]	07/03/2013
<i>Director of Department for new and renewable energy</i> General Directorate of Energy Ministry of Industry and Trade (MOIT)	08/03/2013
<i>Chief Technical Advisor of Wind Energy Project</i> Gesellschaft für Internationale Zusammenarbeit (GIZ) [German International Cooperation]	08/03/2013
<i>Environment and Climate Change Advisor</i> Department for International Development (DFID), UK aid	11/03/2013
<i>Environment and Climate Change Specialist</i> Vietnam Resident Mission, South East Asia Department	11/03/2013
Asian Development Bank (ADB) <i>Former MARD Vice-Minister and Vice-Chairman of National</i>	12/03/2013

(continued on next page)

Appendix B (continued)

Institution and Position of Interviewee	Date of Interview
<i>Committee on Climate Change</i>	
<i>Program Director Management of Natural Resources</i>	12/03/2013
Priority Area Coordinator, Environmental Policy, Protection and Sustainable Use of Natural Resources Gesellschaft für Internationale Zusammenarbeit (GIZ) [German International Cooperation]	
<i>Senior Environmental Economist (Climate Change)</i>	13/03/2013
Sustainable Development Program in Vietnam World Bank	
<i>Environment Cluster Leader</i>	13/03/2013
World Bank	
<i>Clean Energy Program Team Leader</i>	13/03/2013
Energy Sector Management Assistance Program (ESMAP) World Bank	
<i>Two Senior Project Formulation Advisors</i>	13/03/2013
Japan International Cooperation Agency (JICA), Viet Nam Office	
<i>Institutional Strengthening Advisor</i>	14/03/2013
Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE), associated with MoNRE	

Appendix C. Kaya decomposition

This appendix aims to explain the underlying calculations that lead to results presented in Fig. 3. The text is heavily based on Steckel et al. (2011, pp. 3446). In order to come up with a detailed analysis of Vietnam's energy related carbon emissions, we break up emissions-growth along the factors of the Kaya identity (Kaya, 1990), which expresses carbon emissions F as a product of the underlying factors GDP G , primary energy E , and population P :

$$F = P \left(\frac{G}{P} \right) \left(\frac{E}{G} \right) \left(\frac{F}{E} \right) =: P a e k. \quad (\text{C.1})$$

The right-hand-side refers to the relative variables per-capita GDP (affluence) $a = G/P$, energy intensity $e = E/G$, and carbon intensity of energy $k = F/E$. Using the Laspeyres index method¹⁰ (Sun and Ang, 2000), a change over time in emissions ΔF can be expressed as the joint contribution of the four underlying effects (indicated by subscript f),

$$F(t + \Delta t) - F(t) = \Delta F = P_f + a_f + e_f + k_f, \quad (\text{C.2})$$

where each effect can be derived from multiplication, as done here exemplarily for population,

$$P_f = \Delta P \cdot a_t \cdot e_t \cdot c_t + \Delta P \cdot \left[\begin{array}{l} + \frac{1}{2} \cdot [(\Delta a) \cdot e_t \cdot c_t + a_t \cdot (\Delta e) \cdot c_t + a_t \cdot e_t \cdot (\Delta c)] \\ + \frac{1}{3} \cdot [(\Delta a) \cdot (\Delta e) \cdot c_t + (\Delta a) \cdot e_t \cdot (\Delta c) + a_t \cdot (\Delta e) \cdot (\Delta c)] \\ + \frac{1}{4} \cdot (\Delta a) \cdot (\Delta e) \cdot (\Delta c) \end{array} \right]. \quad (\text{C.3})$$

¹⁰ Different methods can be used to decompose the Kaya identity into additive effects, see, e.g. Ang (2004) for a review of different approaches.

The first part of Eq. (C.3) ($\Delta P \cdot a_t \cdot e_t \cdot c_t$) can be interpreted as the partial effect of the population component on the change of CO₂ emissions between time step t' and the preceding step t . The following parts capture interactions between the remaining variables and form the so called residual term.

In order to get a better understanding of the specific dynamics of the carbon intensity, we subject its time-series to an extended decomposition that allows expressing the change in carbon-intensity as a sum of changes in the supply from specific energy carriers. Namely, carbon intensity $k_{t'}$ at time t' can be expressed relative to a preceding time step t as

$$k_{t'} = k_t \frac{E_t}{E_{t'}} + \sum_j \left(\frac{k_{j t'} E_{j t'} - k_{j t} E_{j t}^{j t}}{E_{t'}} \right), \quad (\text{C.4})$$

where j indexes the different energy carriers, e.g. natural gas, coal etc., and $k_{j t}$ represents the specific carbon intensity of energy carrier j at time t , which supplies carrier-specific energy $E_{j t}$. Changing specific carbon intensity over time might be confusing at first sight. However, the composition of energy carriers, e.g. coal, changes over time, as for example lignite is replaced by hard coal or vice-versa. Given that by definition we have

$$E_t = E_{t'} - \sum_j (\Delta E_j), \quad (\text{C.5})$$

where ΔE_j denotes the change between t and t' in energy supply E_j , one can write

$$k_{t'} = k_t \frac{E_t - \sum_j (\Delta E_j)}{E_{t'}} + \sum_j \left(\frac{k_{j t'} E_{j t'} - k_{j t} E_{j t}^{j t}}{E_{t'}} \right). \quad (\text{C.6})$$

The first part of the expression can be interpreted as the energy carrier's changing contribution to the overall energy mix, while the second term of the expression indicates the change of the energy carriers' specific carbon intensity. This can be reformulated to express the change Δk in carbon intensity between t and t' as a sum over contributions from all energy carriers:

$$\Delta k = \frac{1}{E_{t'}} \sum_j (k_{j t'} \cdot E_{j t'} - k_{j t} \cdot E_{j t} - \Delta E_j k_t). \quad (\text{C.7})$$

Δk so far only captures the partial effect. In a complete Laspeyres decomposition, all residuals are taken into account, implying that the effect of carbon intensity k_f can be written as $k_f = \Delta k \cdot R$, where R represents the residual (compare also Eq. (C.3)). R can then be written as:

$$R = (P_t \cdot a_t \cdot e_t) + \frac{1}{2} \cdot (\Delta P \cdot a_t \cdot e_t + \Delta a \cdot P_t \cdot e_t + \Delta e \cdot P_t \cdot a_t) + \frac{1}{3} \cdot (\Delta P \cdot \Delta a \cdot e_t + \Delta P \cdot \Delta e \cdot a_t + \Delta e \cdot \Delta a \cdot P_t) + \frac{1}{4} \cdot \Delta P \cdot \Delta a \cdot \Delta e. \quad (\text{C.8})$$

In order to adapt the decomposition of carbon intensity, i.e. the effect k_f of carbon intensity on the change of emissions, we need to multiply Δk (Eq. (C.7)) by R on both sides. This leads to the graphs shown in Fig. 3, which allow to directly observe the influence of specific changes in the energy mix on emissions.

Appendix D. Renewable energy policies and fossil fuel pricing in Vietnam

Table 3

Overview of new and renewable energy policies as well as fossil fuel and emission pricing policies in Vietnam.

	New and renewable energy (RE) policy	Fossil fuel and carbon pricing policy
Targets defined	<ul style="list-style-type: none"> Increase share of RE from 3.5% of total electricity production in 2010 up to 4.5% in 2020 and 6.0% in 2030 (total power plant capacity RE share of 9.4% in 2030) Specific targets for different technologies 	<ul style="list-style-type: none"> Decrease GHG intensity by 8–10% (compared to 2010) Reduce GHG emissions from energy activities VGGG (2012): <ul style="list-style-type: none"> – 2020: 10% below BAU (20% with international cooperation) – 2030: 20% below BAU (30% with international cooperation)
Measures already implemented	<ul style="list-style-type: none"> Feed-in tariff for wind energy of one US cent/kWh financed by an Environmental Protection Fund Economic incentives (e.g. tax exemptions, preferential loans) First steps concerning phase out of fossil fuel subsidies: government permission to adjust electricity prices in quarterly steps by a maximum of 20% per year 	<ul style="list-style-type: none"> Environmental Protection Tax on several fossil fuels (among other substances)
Work “in progress”	<ul style="list-style-type: none"> 2 nuclear power plants in preparation 	<ul style="list-style-type: none"> Partnership for Market-Readiness with World Bank to assesses the feasibility of several policy instruments Establishing a regular GHG emission inventory
Envisaged measures/objectives	<ul style="list-style-type: none"> Gradual phase out of indirect fossil fuel subsidies State Owned Enterprise (SOE) Reform Competitive power sector Equitization of SOEs (i.e. transformation of state-owned enterprises into shareholding companies, see Do and Sharma (2011) on details) Establishment of an ‘appropriate’ pricing system of energy by the year 2015 (prices equal marginal costs of production) Technology transfer for particularly advanced technologies 	<ul style="list-style-type: none"> “Trading of certified greenhouse gas emissions, carbon tax and fees and levies” VGGG (2012), p.12 Domestic Emission Trading scheme plans for 2020 announced

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