Ecuador's Climate Targets:

A Credible Entry Point to a Low-Carbon Economy?

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Abstract

Long-term credibility is a central pillar of climate policy. This paper assesses whether Ecuador's recently adopted climate targets, policies to decarbonize the power sector, and measures to reduce deforestation constitute a credible basis for a transformation towards a low-carbon economy. Based on the literature on the design of credible climate policy and expert interviews, we argue that even though Ecuador's existing policies may reduce emissions in the short term, they do not yet constitute an entry point for a long-term strategy of economic transformation. We then outline politically and institutionally feasible mitigation measures, which we evaluate from a dynamic policy sequencing perspective according to their potential to prepare the ground for more stringent measures to reduce emission in the future. These measures include inter alia reform of driving restrictions, public transport, vehicle efficiency standards, support for electric cars, and results-based payments to reduce land use emission. Such reforms will need to be phased in gradually and embedded in a broad fiscal reform package. To counter potential adverse distributional effects of higher energy prices, low-income groups could be protected by lowering other taxes, scaling up investment in education, and block-pricing schemes. Furthermore, increased participation of key

stakeholders would likely reduce public opposition against energy- and climate-related policies, such as fossil fuel subsidy reform.

Keywords: Climate policy, fossil fuel subsidies, credibility, political economy, sequencing.

JEL Codes: H23, O54, Q54

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1. Introduction

Due to the long lifetimes of GHGs in the atmosphere and the inertia of energy capital stock, long-term credibility is crucial for the successful implementation of climate measures (Hovi, Sprinz, and Underdal 2009). Policy credibility, understood as the expectation that existing measures will remain in place, or that additional measures will be adopted to meet targets announced by the government, has a strong influence on the economic behavior of non-government actors, e.g. regarding investment decisions (Nemet et al. 2017). For this reason, this study examines whether existing policies are appropriate to incite a long-term transformation of energy and land use patterns.

In 2008, Ecuador became the first country globally to adopt a constitution that includes inalienable rights of nature (Art. 71) (Asamblea Constituyente 2008). The constitution also recognizes the government's responsibility to adopt measures to mitigate climate change (Art. 440). These targets are reflected in the national development plan ('Plan Nacional para el Buen Vivir') for the period 2013-2017, which includes environmental sustainability (objective 7) as well as restructuring economic activity towards decreased dependence on extractive industries and achieving higher shares of renewable energy (objective 10) as important cornerstones for inclusive socio-economic development (Secretaría Nacional de Planificacíon y Desarollo 2013). A pronounced concern for environmental integrity can also be deduced from the most recent World Values Survey (2014), where more than 23% of Ecuadorians named environmental pollution as the 'most serious problem of the world' (compared to less than 6% in Chile and Brazil, roughly 9% in Argentina, and about 18% in Peru).

This perspective seems to be confirmed by the fact that Ecuador's 'Intended Nationally Determined Contribution' (INDC) submitted to the United Nations Framework Convention on Climate Change (UNFCCC) specifies emission reduction targets with respect to a business-as-usual (BAU) projection (Government of Ecuador 2015a). The INDC is based on the national climate change strategy (Government of Ecuador 2012) and climate change plan (Government of Ecuador 2015b) (details on policies are presented in Section 4).

66 One of the key findings of this paper is that current climate measures might be sufficient to achieve
67 emission reductions in the short- and mid-term, especially in view of economic growth rates well below
68 those projected. However, large-scale decarbonization is likely to be obstructed by rapidly growing
69 emissions from oil consumption in the transport sector, where gasoline and diesel are still heavily
70 subsidized. Based on expert interviews and document analysis, we argue that the credibility of efforts
71 to reform these fossil fuel subsidies is undermined by institutional and political barriers, such as the
72 inability to provide compensation for adverse distributional effects and lacking involvement of key
73 stakeholders. We also identify politically and institutionally feasible mitigation options and evaluate
74 these options according to their potential to support economic transformation strategies.

75 This paper proceeds as follows. Section 2 explains the motivation of the study and its relation to the
76 existing literature. Section 3 provides an overview of Ecuador's socio-economic situation as well as
77 current trends in energy use and GHG emissions. Section 4 summarizes climate-related policies on the
78 national and international level. Section 5 qualitatively assesses the credibility of existing policies and
79 evaluates their contribution towards inciting a long-term transformation of energy and land use
80 patterns along the lines of design of rules, transparency and trust, political economy and distribution,
81 as well as robustness. Section 6 discusses measures that could be politically feasible to implement and
82 act as entry points for a transition to a low-carbon economy. Section 7 concludes.

83

84 **2. Research design and relation to previous studies**

85 The central research question addressed by this paper is whether Ecuador's climate targets constitute
86 a credible basis for a long-term strategy of economic transformation. Our analysis is based on 14 expert
87 interviews carried out in Quito in April and May 2016 and complemented by an analysis of official
88 documents. As the interviewed experts covered a broad spectrum, ranging from experts for electricity
89 markets to public finance specialists, we deliberately refrained from using a standardized
90 questionnaire and decided to resort to semi-structured interviews instead. Our interviews included

experts from key ministries (environment, agriculture, and finance), implementing agencies (Servicio de Rentas Internas, Secretaría Nacional de Planificación y Desarrollo, Instituto Nacional de Energías Renovables), national and international NGOs (Grupo Faro, Centro de Planificación y Estudio Social, Friedrich-Ebert-Stiftung) and bi- as well as multilaral donors (United Nations Development Program and Gesellschaft für Internationale Zusammenarbeit) (see Appendix for a list of interview partners and Supplementary Information for an example of interview questions).

The theoretical foundation of this study lies in current advances in the understanding of credibility issues in climate policy formulation. Helm et al. (2003) demonstrate that multiple policy objectives, irreversible energy investments, and the possibility to renege on ex-ante commitments can make announced policies time-inconsistent. That is, even though policy makers have set future targets, they have an incentive to deviate from their plan and impose less stringent policies, for instance as a reaction to strategic underinvestment into abatement technologies by firms who anticipate the government's reaction. Brunner et al. (2012) discuss how legislation of a long term governance framework, delegation to independent authorities, and securitization (i.e. creating financial commitments vis-à-vis investors) can enhance the credibility of long-term climate policies. Aldy (2014) emphasizes the importance of policy surveillance and shows how increasing transparency can strengthen participation in and compliance with international climate agreements.

For the analysis of Ecuador's climate targets, we rely on the framework proposed by Nemet et al. (2017). Based on insights from various policy areas (such as monetary, fiscal and trade policy), this framework identifies four key elements of credible climate policy: the design of rules, transparency and trust, political economy and compensation, as well as robustness (see Section 5 for details). This paper hence contributes to a fast-growing literature on the political economy of climate policy (Helm 2010; Lachapelle and Paterson 2013; Fankhauser, Gennaioli, and Collins 2015). In particular, our analysis of factors that undermine the long-term credibility of Ecuador's climate targets is closely related to contributions assessing political and institutional barriers to climate policy implementation (Unruh 2000; Staub-Kaminski et al. 2014), and our assessment of feasible mitigation policies that might

pave the way for more ambitious future targets is conducted from the perspective of the literature on policy sequencing (Meckling et al. 2015). Focusing on the credibility of real-world policies, our analysis applies insights from the theoretical literature on credibility and commitment to assess the role of political and institutional factors for the feasibility of climate policy in Ecuador.

In terms of regional coverage, Latin America has received comparatively little attention in the literature on climate change mitigation so far. Most studies deal with the largest economies in the region, especially Brazil (Lucena et al. 2016; Octaviano, Paltsev, and Gurgel 2016), Mexico (Veysey et al. 2016; Rosas-Flores et al. 2017) and Chile (García Benavente 2016; Sanhueza and de Guevara 2014). Existing literature on Ecuador has mostly focused on the proposal to leave oil reserves located in the Yasuní national park unexploited in exchange for compensatory payments from the international community (Finer et al. 2009; Rival 2010; Vallejo et al. 2015). A notable exception is Escribano (2013), who shows how Ecuador's energy policy aims to achieve contradictory environmental and development targets. In a similar vein, Finer et al. (2008) examine the impacts of oil and gas exploitation on biodiversity and indigenous communities in the Western Amazon, and Bozigar et al. (2016) analyze the effects of oil extraction on indigenous livelihoods in the Northern Ecuadorian Amazon.

To our knowledge, our study is the first to address the political economy of Ecuador's energy policies from the perspective of climate change mitigation. As Ecuador is a comparatively small emitter, accounting for only 0.3% of global GHG emissions, national climate change mitigation policies will have rather minor direct effects on the global climate. Nevertheless, Latin America is frequently regarded as a 'bell-weather' for reconciling socio-economic with environmental goals. Hence, successful steps towards low-carbon development in Latin America could provide a motivation for other regions to strengthen their climate policies (Edwards and Roberts 2015). In addition, understanding the political impediments for the achievement of long-term climate targets, and how these impediments can be overcome, can yield important insights to inform policy design in other countries (Steinberg 2015).

3. Socio-economic development, energy use, and emissions

This section first provides a brief overview of current socio-economic developments in Ecuador. It then discusses the structure and development of the country's energy use patterns and GHG emissions.

3.1. Socio-economic situation

Ecuador has a population of slightly above 16 mn. Since 2001 its official currency is the US$, which was adopted after a serious banking crisis in the late 1990s had resulted in inflation rates of more than 50% (Jácome 2004). Living conditions have persistently improved throughout the past two decades. For instance, life expectancy increased from 71 years in 1995 to about 76 years in 2015, while during this period infant mortality declined from 35 to 18 per 1'000 live births, and the share of people living below the poverty line of US$ 1.90 per day (at year 2011 PPP US$) declined from almost 14% to less than 4% (see Table 1). However, economic inequality remains an important concern. Even though it has persistently declined, the Gini index still exceeds 45, and more than 35% of national income accrues to the richest 10% of the population, whereas the poorest 10% only receive 1.7%. In addition, even though access to electricity is almost universal, more than 13% of the population does not have access to a clean water source, and more than 15% lacks access to decent sanitation facilities.

Per-capita income is roughly US$ 5'400 at year 2010 US$ (slightly below US$ 11'000 at power-purchasing parity). The economy displayed robust economic growth of on average more than 4% per year between 2000 and 2014. As an upper middle income country, official development assistance (ODA) is of relatively minor importance for Ecuador; in 2014, ODA amounted to about 0.2% of GDP (World Bank 2016).

However, Ecuador's economy, which is highly dependent on oil exports, suffered substantially from the decline of oil prices, such that economic growth in the year 2015 was close to zero. On April 19, 2016, the country was struck by a major earthquake of scale 7.8, causing more than 600 casualties and resulting in economic costs of more than 3% of GDP (New York Times 2016). As a result, economic activity was forecast to contract by more than 2% in 2016 (IMF 2016).

	1995	2000	2005	2010	2015
GDP/cap (constant 2010 US$)	3847.5	3678.9	4286.5	4657.3	5366.5
GDP/cap PPP (constant 2011 international US$)	7726.2	7387.6	8607.8	9352.3	10776.6
GDP growth (%)	2.3	1.1	5.3	3.5	0.2
Poverty ($1.90/day, 2011 PPP) (%)	13.8	28.2	13.6	7.1	3.8*
Life expectancy (years)	71.2	72.9	74.1	75.0	75.9*
Infant Mortality (per 1000)	35.2	28.4	24.3	21.3	18.4
Income share highest 10%	40.0	45.9	42.6	38.4	35.2*
Income share lowest 10%	1.0	0.9	0.9	1.4	1.7*
GINI index	51.0	56.4	54.1	49.3	45.4*
Access electricity (%)	..	94.0	..	97.0	..
Access sanitation (%)	63.5	69.7	75.3	80.7	84.7
Access water (%)	76.8	79.7	82.3	84.9	86.9

Table 1: Selected socio-economic indicators for Ecuador for the period 1995-2015.: Value for 2014. Source: World Bank (2016).*

Since President Correa assumed office in 2007, public spending as a share of GDP has almost doubled (Figure 1), which is only partly covered by increasing oil revenues and higher taxes. Even though expenditures have been cut to counter the budgetary impact of declining oil revenues, budget deficits of roughly 5% have persisted since 2013. At 39.6% of GDP, public debt is close to the constitutional limit of 40%; to circumvent this limit, a recent presidential decree has redefined which positions constitute public debt (El Comercio 2016).

To cover the additional costs of earthquake damages, the government raised the value-added tax (VAT) from 12% to 14% and introduced a special tax on higher earners (The Telegraph 2016). The need to cover current expenses also led the government to dissolve the stabilization fund that had priorly been available as a mechanism to smooth out oil price volatility (New York Times 2016). Moreover, the government is increasingly relying on Chinese 'loan-for-oil' contracts, under which credits are repaid in kind (Escribano 2013)[1]. These arrangements have repeatedly been criticized for their lack of transparency (Santos Saint Romain 2016).

[1] Even though Ecuador had been cut off from the international bond market after defaulting on its foreign debt in 2008, it successfully attracted new loans from foreign lenders in 2015 (Financial Times 2015).

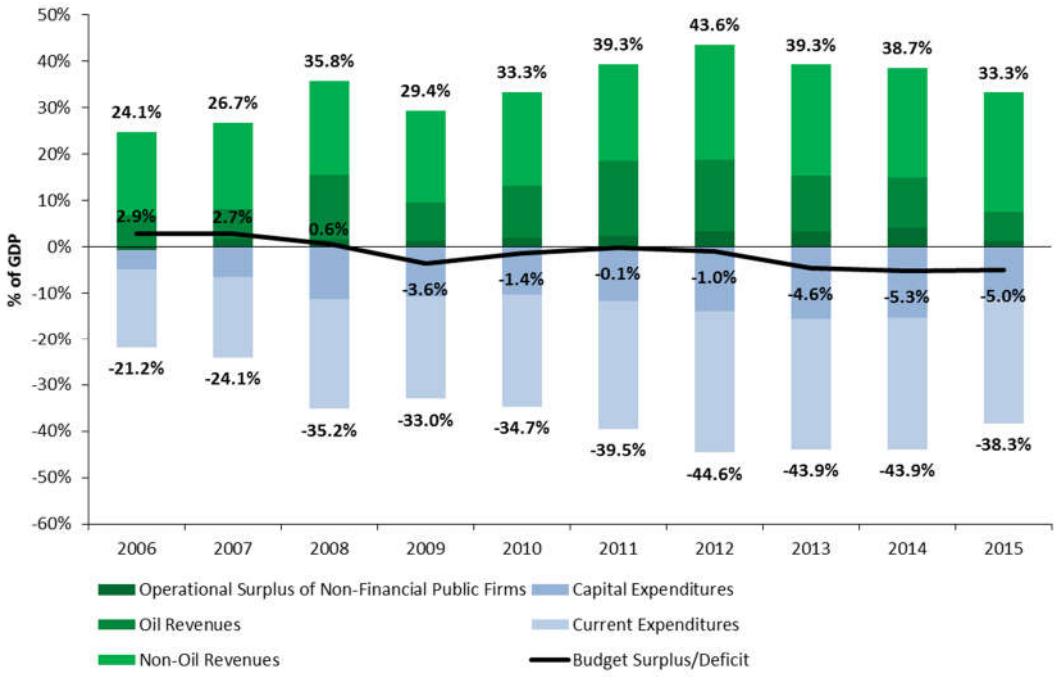


Figure 1: Total expenditures, revenues, and budget deficit as share of GDP. Own depiction based on data from the Ecuadorian Central Bank (2016)

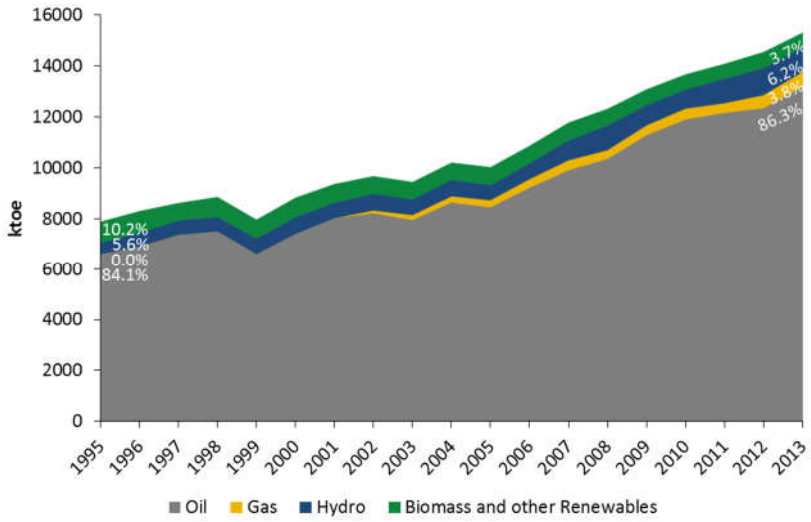
3.2. Energy use and emissions

Producing about 543'000 barrels of oil per day in 2015, i.e. about 0.7% of global production, Ecuador is the smallest OPEC member. Its total recoverable oil reserves are estimated to be 1.2 bn tons, roughly 0.5% of global reserves (BP 2016). All hydrocarbon resources are owned by the State. Even though the brunt of resource extraction is carried out by state-owned enterprises, some foreign companies operate on the basis of a fixed service fee for exploration and production (EIA 2015).

Total primary energy consumption has almost doubled since 2000 (Figure 2a). Oil still makes up about 85% of energy use. Oil products are mainly used in the transport sector, which accounts for the largest share of energy consumption, as well as for electricity generation. Despite Ecuador's substantial hydropower potential, oil consumption in the power sector has increased, not only in absolute, but also in relative terms: whereas oil-fired power plants accounted for about 28% of power generation in

2000, this number had increased to almost 35% in 2012 (with hydro accounting for roughly 54%, and natural gas for 10%, with a negligible share for other renewable energy sources, such as biomass) (IEA 2015). As power generation is regarded to be a strategic sector, it is planned and regulated by the government, and participation of the private sector in power generation and transmission is limited to a maximum share of 49%.

(a)



(b)

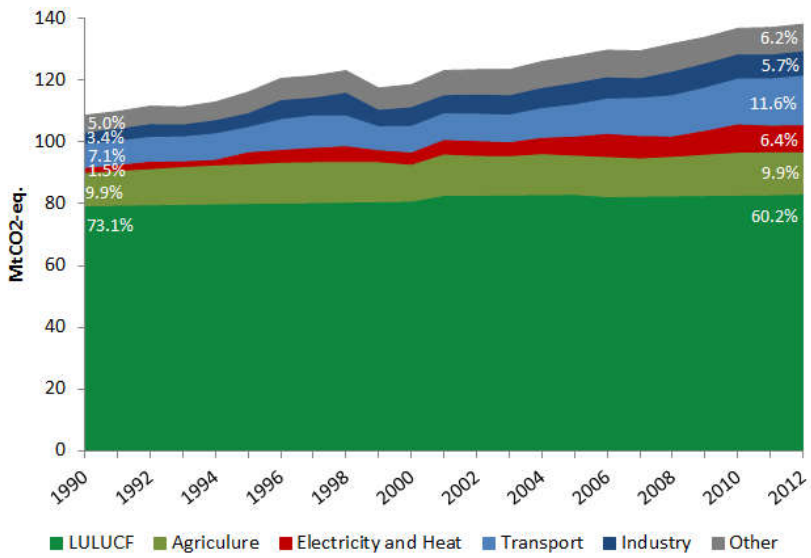


Figure 2: Energy use by energy carriers (panel a) and emissions by sector (panel b). Own depiction based on data from IEA (2015) and CAIT (2014).

Per capita greenhouse gas (GHG) emissions (including non-CO_2 GHGs, such as methane) amount to about 9 tCO_2-eq., considerably above the world average of about 6.6 tCO_2-eq. The main sources of emissions are deforestation and land use change (LULUCF), as depicted in Figure 2b. However, there is substantial uncertainty regarding land use emissions. Official Ecuadorian sources put land use emissions at 16 $MtCO_2$-eq. (Government of Ecuador 2015b), which is less than 20% of the 83 $MtCO_2$-eq. stated in the CAIT (2014) data. The fastest emission growth has been observed in the power and the transport sector, where emissions have increased by on average 7% and 6% per year since 2000, respectively.

In recent years, the government has been active to devise policies on the international as well as on the national level to slow down the increase in overall emissions and eventually achieve emission reductions. These policies will be discussed in the next section.

4. Energy and climate policies

This section first reviews energy and climate policies that have been enacted on the international and the national level. It then discusses how these policies could be harmonized with respect to the concept of 'net avoided emissions' and implemented by means of carbon pricing.

4.1. International position

Ecuador has been a member of the UNFCCC since its inception in 1994 and has provided two national communications (Ministerio del Ambiente 2000; Ministerio del Ambiente 2011), which include inventories of emission sources and identify mitigation potentials as well as adaptation needs. The third national communication is currently under preparation and expected to be released in early 2017.

In the international arena, Ecuador has historically been aligned with the Bolivarian Alliance for the Peoples of our America (ALBA) countries. This group, which also includes inter alia Bolivia, Cuba,

Nicaragua, and Venezuela, has so far been reluctant to reduce their emissions, emphasizing their right to development and the historical responsibility of industrialized countries. However, the Ecuadorian government is regarded to be the most progressive of the ALBA countries and to gradually assume a more constructive role in international climate policy (Edwards and Roberts 2015). In the wake of the 21st conference of the parties (COP21) in 2015, which resulted in the Paris Agreement (UNFCCC 2015), Ecuador presented its INDC. Commitments to reduce emissions are defined relative to a BAU projection (Government of Ecuador 2015a). In terms of reduction commitments, the INDC states an unconditional reduction target of 20.4% to 25.0% below BAU by 2025, and a more ambitious target of 37.5% to 45.8% below BAU conditional on international assistance. In order to achieve these targets, the share of renewable energy in the power sector is targeted to reach 90% by 2017 (mostly by large hydropower plants with envisaged new capacities of more than 4'300 MW in addition to the BAU) and increase even further until 2025. Furthermore, in the unconditional case, 1.5 mn induction stoves shall be introduced and 4.3 mn in the conditional one. Finally, in addition to emission reductions in the energy sector, the INDC also mentions the conditional target of preventing cutting down 2 mn hectares of forest until 2025, but does not translate this target into emission reductions.

Interestingly, the document does not reveal the BAU projection against which these reduction targets are defined, making it impossible to assess their stringency. From one interview partner, we were able to obtain projections for energy-related CO_2 emissions (which neither include land use, the largest emission source, nor non-CO_2 GHGs). This projection, displayed in Table 2, is based on the assumption of continued economic growth of about 5% per year. In the BAU, new power generation is assumed to be covered by 50% hydro and 50% oil-fired, resulting in an increase of CO_2 emissions of slightly more than 80% by 2025. The reductions envisaged for energy-related CO_2 emissions fall in the range indicated by the INDC for total emissions (however, it is not clear whether the INDC assumes a comparable BAU increase of total emissions). It should be noted that even the conditional target corresponds to an increase of emissions of almost 10%.

The government's Yasuní-ITT initiative envisaged to leave roughly 850 mn barrels of oil located inside one of the world's most biodiverse regions untapped if half of the foregone revenues, i.e. US$ 3.5 bn (given the oil price at the time the proposal), were covered by the international community (Vallejo et al. 2015). However, this proposal received only lukewarm support by potential donors, who were afraid to create a precedent that would have provided an incentive for other countries to use the threat of destroying their natural reserves to demand financial compensation for not doing so. As a consequence, drilling has begun in 2016 (The Guardian 2016).

	2015	**2020**	**2025**
BAU	39.8	60.5	72.5
Unconditional	39.8	46.5 [-23.1%]	56.0 [-22.8%]
Conditional	39.8	41.4 [-31.6%]	43.2 [-40.4%]

Table 2: Projected energy-related CO_2 emissions to achieve Ecuador's INDC (in $MtCO_2$). Values in brackets indicate reductions relative to the BAU. Emission reductions for the unconditional and conditional reduction targets are within the ranges of reduction target indicated in the INDC for total emissions. Source: personal communication.

Ecuador is part of the REDD+ early mover program. Under this program, Germany and Norway provide up to US$ 90 mn per year in the form of results-based payments to reward emission reductions from avoided deforestation with respect to an agreed baseline (at an implied carbon price of US$ 5 per ton of CO_2). In total, Ecuador has received climate finance of about US$ 2.2 bn between 2010 and 2013, predominantly in form of loans from the Inter-American Development Bank and the Latin American Development Bank (Peláez and Herrera 2014).

Finally, Ecuador has also advocated the so-called Daly-Correa tax, which would impose a tax of 3 to 5% on oil exports to industrialized countries and channel the resulting revenues into climate measures in developing countries (The Guardian 2012).

4.2. National policies

The National Climate Change Strategy (Government of Ecuador 2012) lays down abstract principles, and the more detailed National Climate Change Plan deals with implementation issues in the short and medium term (Government of Ecuador 2015b). Moreover, the aim to decarbonize the power sector by increasing the share of hydropower is laid down in the National Energy Agenda for the period 2016 to 2040 (Ministerio Coordinador de Sectores Estratégicos 2016).

Most interviewees stated that the main motivation to expand hydropower does not lie in environmental considerations, but can be explained by the fact that generation costs are well below those of oil-fired power station, which currently account for roughly 35% of power production (see Section 0). In addition, hydropower is believed to be a centerpiece of economic modernization, including plans to increasingly introduce induction stoves and electric cars, and perhaps export electricity to neighboring countries, namely Peru, Colombia and Chile. To this end, nine new hydropower plants with a capacity of 8'700 MW are envisaged. The Sopladora plant with a capacity of about 500 MW was inaugurated in August 2016, and the Coca-Codo Sinclair plant went fully online with a capacity of 1'500 MW in November 2016 (CELEC 2016).[2]

Despite these efforts to decarbonize the power sector, fossil fuels receive substantial subsidies by means of price controls. For instance, at the time of research, super gasoline was sold for US$ 0.39 per liter (GlobalPetrolPrices.com 2016). The subsidy which results from the opportunity cost of not selling these fuels at the world market price does not appear in the public budget. Subsidies are most salient for gasoline, diesel, and liquid petroleum gas (LPG). As shown in Figure 3, in 2014, these subsidies amounted to almost US$ 4 bn, or 3.8% of GDP. The policy of price controls have remained firmly entrenched (see Section 5.3), and fossil fuel use remains indirectly subsidized in the form of block-pricing, under which low-consumption households benefit from a reduced electricity tariff (see Section 6.3). Announced fossil fuel subsidy reforms have been restricted to the removal of financial support

[2] One interviewee mentioned that decreasing water availability might make these plants vulnerable to climate change, and that this concern had not been addressed in the plants' feasibility studies in a satisfactory way.

for jet fuels and diesel consumed by foreign trucks (El Comercio 2015). Hence, the decline of fossil fuel subsidies by more than half observed in 2015 can mainly be attributed to the fall in global oil prices.

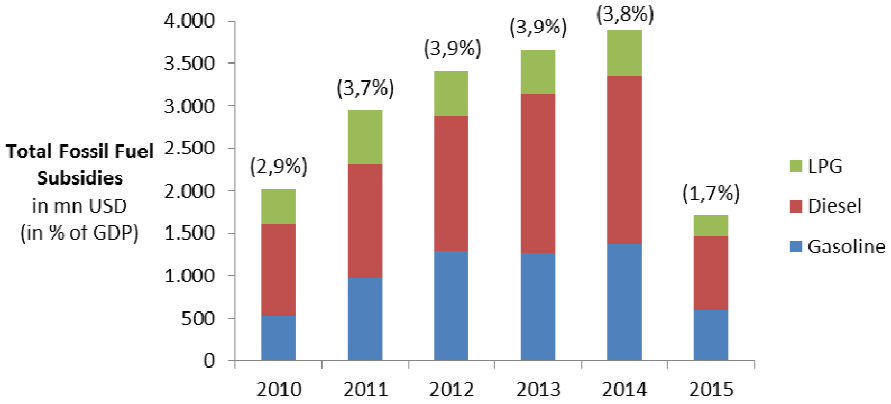


Figure 3: Fossil fuel subsidies in Ecuador (total amounts and percent of GDP). Own depiction based on data from the Ecuadorian Central Bank (2012; 2015).

To reduce emissions from land use and forestry, the National Climate Change Plan includes provisions to promote sustainable livestock farming and foster reforestation (Government of Ecuador 2015b). The program Socio Bosque, inaugurated in 2008, provides financial rewards to forest owners for refraining from deforestation. It aims to halve the rate of deforestation and conserve about 4 mn hectares of forests (which amounts to about two thirds of those forests that are not included in special protected areas). By December 2015, almost 200'000 people participated in this scheme, resulting in an estimated avoided deforestation of roughly 1.5 mn hectares (Ministerio del Ambiente 2016).

4.3. Linking national and international policies

In the international arena, Ecuador's delegation has repeatedly advanced the concept of 'net avoided emissions', which would provide financial assistance to reward emission reductions from the cessation of fossil fuel exploitation and land conversion below an agreed baseline (as had been intended under the Yasuní proposal) (Köhler and Michaelowa 2014). This scheme would impose a 'shadow price' on

emissions, as every unit of GHG emissions would entail opportunity cost of foregoing a payment from the international community.

A straightforward way to implement this approach into domestic policy would be an economy-wide carbon price. Carbon pricing would not only be an economically efficient mitigation policy, but could also increase the efficiency of the tax system and yield important co-benefits (Edenhofer et al. 2015). Ecuador's constitution explicitly mentions pro-environmental conduct as an integral objective of fiscal policy (Art. 300) and 'green' taxes already exist for cars (depending on engine size) and plastic bottles (Almeida 2014). However, due to high transaction costs and difficulties related to monitoring, reporting, and verification, carbon pricing seems ill-suited for agriculture, land use, and forestry (Grosjean et al. 2016), which is the largest source of emissions in Ecuador. In addition, as discussed above, in many areas carbon prices are persistently negative, namely in the form of subsidies for fossil fuels. Experiences of wide-spread protest against rising fuel prices (Ross, Hazlett, and Mahdavi 2017), most recently in Mexico, as well as President Correa's decision to exempt fossil fuels from the VAT increase confirm how contentious this topic is. In fact, the large majority of interviewees agreed in their assessment that comprehensive fossil fuel subsidy reform is unlikely in the near future. This is an especially relevant concern for the transport sector. In the absence of incentives to adopt less carbon-intensive mobility patterns, this sector is likely to turn into a 'roadblock for climate change mitigation' (Creutzig et al. 2015).

Against this background, the following section analyzes the long-term credibility of Ecuador's climate targets as a basis for a long-term strategy of economic reform. The analysis adopts a dynamic perspective that does not primarily focus on short-term emission reductions, but rather on the political feasibility of a long-term transition to a low-carbon economy. For this reason, we pay particular attention to the power and the transport sector, in which long-lived infrastructure (power plants, roads, etc.) can be expected to result in the highest risk of 'carbon lock-in' (Erickson et al. 2015).

5. Assessing the credibility of Ecuador's climate policy

As Ecuador's INDC and national climate change plan do not specify the BAU trajectory against which reduction targets are defined, it is impossible to make a statement on whether these reductions are likely to be achieved. In view of the current economic downturn, it seems reasonable to expect only moderately increasing, or perhaps even declining, emissions in the near future. However, the crucial question for climate change mitigation is not whether a short-term target can be met, but rather whether policies are appropriate to pave the way for a transition towards a low-carbon economy. Drawing on the framework established by Nemet et al. (2017), this section assesses how credible Ecuador's climate policies are as a basis for a strategy of long-term economic transformation. This framework includes four key components, namely the design of rules, transparency and trust, political economy and distribution as well as robustness. In the following, we will introduce each of these categories and apply them to analyze Ecuador's policies.

5.1. Design of rules

A crucial design feature for any long-term policy is to establish rules that are credible while at the same time allowing for a certain degree of flexibility to deal with unexpected events (Jakob and Brunner 2014).

Several stipulations that are relevant for Ecuador's energy and climate policy are not spelled out in full detail. This has become apparent for the discussion of the INDC in Section 4, for which the failure to specify the BAU emission trajectory make it impossible to assess how stringent reduction targets are compared to current levels. Another salient example is the law regulating the power sector ('Ley Orgánica del Sevicio Público de Energía Eléctrica', Asamblea Nacional 2015). This piece of legislation repeatedly points to further regulations of specific details, such as the definition of 'non-conventional renewables'. However, according to information by one interviewee, these regulations did – at least until the date of the interview – not exist. Such gaps in the regulatory framework make it hard to form

long-run expectations and open the door for manipulation to achieve short-term political aims (Brunner, Flachsland, and Marschinski 2012).

The problem of incomplete regulation gets exacerbated by the fact that Ecuador's energy policy is highly politicized and frequently employed as a tool to reward important interest groups. According to one interviewee who has been involved in the formulation of the power sector regulation, attempts to establish an independent regulatory agency were repeatedly thwarted by political interests ("the politicians have won"). This is in stark contrast to the aim of substituting policy makers' discretion by rule-based pricing mechanism, which emerged as one of the key elements of successful energy market reforms (IMF 2013). In addition, energy-related policies sometimes follow contradictory aims, such as promoting environmental integrity and providing cheap energy (Escribano 2013), which is known to be a major impediment for credible climate policy (Helm, Hepburn, and Mash 2003).

Further, for fossil fuel exporters, consumption subsidies that are delivered by means of price controls can be regarded to dispose of a kind of 'automatic stabilizer'. That is, if the public budget suffers because world market prices for, say, oil are low, subsidies (which result from the difference between the fixed domestic and the world market price) will also decline. Hence, subsidy reform is regarded as a less pressing issue in times in which the need to consolidate public finances opens a window of opportunity for fiscal reforms.

5.2. Transparency and trust

Transparency is important to provide information and to hold policy makers accountable for their actions (Aldy 2014). Even though the government makes a large array of data available online, there is some concern regarding their reliability. For instance, the emission data reported in the INDC are not in line with other data sources, such as the Climate Analysis Indicator Toolkit (CAIT 2014), which are regarded as highly trustworthy (see Section 0). According to one interviewee, the difference can be explained by the fact that not all industrial sectors were part of the inventory. This interviewee also

suggested a political motivation to bias emissions downwards in order to claim some first successes in climate change mitigation (and be eligible for financial assistance, e.g. from the Green Climate Fund).

Civil society has a central role in the process of putting environmental legislation on the political agenda, assisting in its design, and monitoring its implementation (Hochstetler 2012). The government of Rafael Correa has a long history of restricting the activity of civil society. As succinctly stated by the non-governmental organization Human Rights Watch (2016), "[t]he administration of President Rafael Correa has expanded state control over media and civil society and abused its power to harass, intimidate, and punish critics".

Finally, policy-making in Ecuador is marked by frequent reversals. For instance, since Rafael Correa assumed office in 2007, the country has experienced 16 tax reforms. Another example concerns support for renewable energy, which had been subject to rather generous feed-in tariffs (FiTs) of more than US$ 0.50 per kWh for solar power until 2010, when they were abolished (Jacobs et al. 2013). The same is true for tax breaks for hybrid vehicles, which had led to an increase of the annual sales of hybrids from about 500 to 4'500 between 2008 and 2010 (El Comercio 2014c). According to one interviewee, support for renewables and hybrid cars was mainly withdrawn because of excessive costs to the public budget. Similar issues also have contributed to the lagging adoption of induction stoves. The government had offered financial support for the acquisition of such stoves, with the intention to make the announced reduction of LPG subsidies less painful for affected households. Even though technical problems (related to the voltage commonly used in the residential sector and the one required for the stoves) were also at play, it has been suggested by one interviewee that the population didn't believe that the LPG subsidy reform would really be carried through.

5.3. Political economy and distribution

To be politically feasible, climate policies need to be regarded as ensuring equitable outcomes (Markandya 2011). Despite overwhelming evidence that the lion's share of fossil fuel subsidies is

422 captured by the richest households, low energy prices are still frequently assumed to be a pro-poor
423 policy (Arze del Granado, Coady, and Gillingham 2012; Sterner 2011). In theory, political resistance
424 could be addressed by implementing a 'first-best' policy and using the resulting gains in economic
425 efficiency to compensate political losers (Acemoglu 2003). In reality, however, lump-sum
426 compensation mechanisms may be unavailable to policy makers, such that they resort to less efficient
427 policies to provide benefits to special interest groups (Dixit, Grossman, and Helpman 1997). Indeed,
428 oil rich countries are found to provide higher fossil fuel subsidies (Cheon, Urpelainen, and Lackner
429 2013), and it has been argued that these subsidies might be an attractive device to distribute natural
430 resource rents, as they are "easier to observe, easier to commit to, easier to deliver, or better targeted
431 at core groups, than other public goods or favors o ered by rulers" (Strand 2013).

432 This perspective is corroborated by several interview partners, who emphasized that citizens feel a
433 strong sense of entitlement to receive a share of their country's resource wealth (see Segal 2012;
434 Friedrichs and Inderwildi 2013). According to the interviewees, most citizens understand that from the
435 low fuel prices they only capture a disproportionally small share of the resource rent. Yet, low trust in
436 the government to use the additional public revenues in a productive way if the subsidies were
437 abolished results in a preference for maintaining them. Providing cash payments in exchange for higher
438 fuel prices has emerged as a promising approach to reform fossil fuel subsidies in other countries (IMF
439 2013; Vagliasindi 2013). However, most interviewees held the view that citizens would not believe that
440 such a transfer would be permanent. Recent issues of corruption and misappropriation related to the
441 'bono de desarrollo' scheme, which provides financial assistance to poor households (El Expreso 2015),
442 are regarded to further undermine the government's credibility in handling cash transfers. An
443 alternative way of compensation might be redirecting fossil fuel subsidies to public investment, e.g. in
444 basic infrastructure (Jakob et al. 2015). Besides the question of whether the government is trusted to
445 be able to undertake well-targeted investments, Ecuador's constitution does not allow for earmarking
446 of revenues (with the exception of few special areas, such as education).

Hence, compensating 'political losers' is costly, and one interview partner noted that past efforts to reform fossil fuel subsides "have cost more than they have yielded for the government budget". Likewise, another one described fossil fuel subsidy reform as "the most unpopular measure imaginable". In this context, it is important to note that to date, no comprehensive studies on the distributional effects of subsidy reform and compensation mechanisms have been undertaken. As a consequence, distributional concerns continue to be a major impediment for the credibility of the announced climate targets.

5.4. *Robustness*

Some authors have pointed out that 'hybrid' and overlapping policies, such as a carbon price in combination with FiTs, can be advantageous to simultaneously address distributional aims and ensure that removing one piece of legislation does not amount to a fundamental policy change (Lockwood 2015).

Even though Ecuador employs a wide array of different policies to address climate-related targets, many are not so much concrete measures, but rather abstract plans. These plans were often designed independently by the respective ministries, without ensuring a sufficient degree of coordination with other ministries. In fact, several interviewees mentioned that they had problems to keep an overview of recent ideas and proposals discussed in or advanced by relevant government bodies.[3] The 'Comité Interinstitucional de Cambio Climático' which has been established in 2009 (Government of Ecuador 2009) to ensure consistency in the formulation of climate policy, so far does not seem to make a major contribution towards this end. For this reason, several interview partners mentioned fragmentation of policies as one of the most important problems for climate policy, some even speaking of a "regulatory

[3] These include Ministry of Electricity and Renewable Energy (MEER), Ministry of the Environment (MEA), Ministry of Hydrocarbons (MH), Ministry of Production, Employment, and Competition (MPEC), Minitry of Transport (MT), Ministry of Energy and Mines (MEM), Ministry of Coordination of Strategic Sectors (MICSE), National Secretary for Planning and Development (SENPLADES), in addition to several Secretarías acting as implementing agencies.

chaos". In addition, it appears that policies are not always properly sequenced. One interviewee suggested that policy-makers are often "doing the second step before the first", for instance by approving the construction of new hydropower plants before the associated feasibility studies had been finished. Another example is the termination of the Fondo Ambiental Nacional, which was used to handle payments from the international community for environmental programs, before an alternative mechanism had been established. This resulted in losses of financial assistance.

The issues discussed in this section hence call into question the credibility of Ecuador's climate targets as a basis for long-term economic transition towards a low-carbon economy.

6. Entry points for a low-carbon transition

The previous section has pointed out that numerous issues hamper the implementation of climate measures and hence undermine the credibility of Ecuador's climate policy in the long term. This section aims at identifying measures that are politically feasible in the short term and prepare the ground for a transformation of energy and land use patterns (Jakob, Steckel, Klasen, et al. 2014; Meckling et al. 2015)

6.1. Design of rules

The impression from our interviews that administrative capacity is, at least in some instances, not sufficient to implement effective climate policy is backed up by the World Bank's World Governance Indicators (WGI 2016), where Ecuador figures in the lowest 12 and 14 percent for the indicators for the quality of government and the rule of law, respectively. Even though institutions are known to be 'sticky' and institutional change is a slowly moving gradual process (Nunn 2008), capacity building by the international community can make an important contribution to enhance the capabilities of public sector actors to develop and implement environmental legislation (VanDeveer and Dabelko 2001). To come to fruition, this kind of support needs to ensure national 'ownership' i.e. support activities that

arise from considerations of national self-interest rather than being donor-driven (Zimmer, Jakob, and Steckel 2015). Heeding this insight is likely to be especially important for the case of Ecuador, where policy makers are wary of outside interference and the notion of neo-colonialism is prevalent in the public discussion.

Results-based payments constitute a promising mechanism to support climate change mitigation policies, while at the same time guaranteeing ownership (Steckel et al. 2017). This approach has been used under the REDD+ early mover program (see Section 4.1). Using similar schemes for other economic sectors, such as industry, transport, or resource extraction, would be in line with the net avoided emissions approach discussed in Section 4 and could help to build up trust and the institutional framework required for a long-term transformation of Ecuador's energy and land use systems.

Independent from international cooperation, the credibility of climate policies could be significantly strengthened by emphasizing links with other policy objectives, such as reduced local air pollution and congestion, conservation of biodiversity, and increased energy security (Jakob, Steckel, Klasen, et al. 2014). Even though these arguments have found to be important in national discourses on climate policy in other countries (see e.g. Dubash 2013 for India; Zimmer, Jakob, and Steckel 2015 for Vietnam), they do not seem to play a major role in Ecuador.

6.2. Transparency and trust

Capacity building can not only support the drafting and implementation of legislation, but also the collection and verification of data. This is especially important for climate finance in order to ensure that disbursed funds achieve actual emission reductions without negatively impacting other dimensions of sustainable development (Jakob, Steckel, Flachsland, et al. 2014).

In addition, climate finance can act as an important commitment device. From this perspective, national and international policies can be regarded to interact in a 'two-level game' (Putnam 1988). That is, the threat of losing funds from donors would strengthen the government's position vis-à-vis

politically powerful interest groups lobbying for a repeal or a less stringent interpretation of existing climate targets (Jakob and Hilaire 2015).

Finally, given the history of repression against civil society, it appears unlikely that a fundamental shift in government policy towards an open dialogue (such as in Chile, where more than 250 consultations were held in preparation of the country's INDC) will occur in the near future. Nevertheless, the government might have at least some narrowly defined self-interest to use existing stakeholder mechanisms. In the preparatory stages for certain policies, so-called 'mesas rondas' are required, but, according to information from the conducted interviews, these round tables are either not used, or selectively stacked with stakeholders that are in favor of the government's proposals. Involving critical positions at this stage of the policy cycle would help to anticipate the most serious controversies and avoid wide-spread protest, which occur on a regular basis to voice discontent with planned policy measures.

6.3. Political economy and distribution

Given the problems related to earmarking and productive investment of public revenues, probably the most straightforward way to protect adverse impacts of energy price increases would be lowering other taxes, for instance the VAT. In addition, some interview partners suggested that channeling additional public revenues from fossil fuel subsidy reform or carbon pricing into the education system might constitute a popular measure, as unequal access to education is widely regarded to be one of the fundamental causes perpetuating social and economic inequality (The Economist 2016).

The 'tarifa dignidad' block-pricing scheme, which provides electricity at a lower rate for households that are low consumers[4], would protect these households from the adverse effects of higher energy

[4] Under the tarifa dignidad, households consuming less than 110 kWh per month in the Sierra region, and less than 130 kWh per month in the Costa region, are charged 4 USc/kWh, instead of the normal rate of 9.33 USc/kWh. Out of 4.1 mn households, 2.5 mn (accounting for 20% of electricity use) benefit from the tarifa dignidad (El Comercio 2014b).

prices. One can expect comparatively low economic distortions for such schemes, at least as long as they are designed to only cover basic electricity needs, which would also be demanded at a higher price. In this case, inelastic demand means that a price that lies below the social costs of electricity production does not have a major influence on economic behavior, but approximates the characteristics of a pure transfer. In order to ensure that only low-income households benefit from this support, categorical means-testing is a central issue (Borenstein 2012), which could help to make the current scheme more efficient. Some interview partners also suggested to expand this logic to transport fuels, allowing poor people to acquire a certain amount of gasoline or diesel at a low price, whereas others would be charged approximately the world market price. Clearly, this proposal would suffer from fungibility, as fuels could be bought at the subsidized rate and resold at the normal rate. Yet, it would still be more efficient than the current approach of handing out subsidies indiscriminately. Furthermore, it would be in line with the step-wise approach to instigate subsidy reform mandated in the literature (IMF 2013).

In any case, carrying out studies to assess the potential distributional impacts of different policy proposals would contribute to a deeper understanding of how different social groups would be affected, and would allow devising appropriate compensation schemes. This kind of analysis has been undertaken for numerous countries, either on the basis of computable general equilibrium models (e.g. Coxhead, Wattanakuljarus, and Nguyen 2013 for Vietnam) or household data in combination with input-output analysis (e.g. Grainger and Kolstad 2010 for the US). Our interviews indicate that the required data would either be already available, or could be obtained without incurring major problems.

6.4. *Robustness*

A salient example of a policy that is relevant for climate change mitigation is the so-called ‘pico placa’ scheme, which imposes driving restrictions on cars with certain number plates on certain days, aiming to reduce congestion and local air pollution. However, there is robust evidence from other cities that

567 this kind of scheme is unlikely to achieve its goal and might even result in exacerbating the problem it
568 intends to address, as more old, inefficient cars remain in the vehicle fleet in order to be able to
569 circumvent the driving restriction (Davis 2008; Gallego, Montero, and Salas 2013). Recent evidence
570 suggests that driving restrictions can work if modern, efficient cars are exempted from the restriction,
571 thus providing an incentive to accelerate the turn-over of the vehicle fleet (Barahona, Gallego, and
572 Montero 2015). Importantly, increasing the share of efficient cars would not only reduce emissions,
573 but would also alter the underlying political economy, as owners of efficient cars would be less affected
574 by future fuel price increase and hence less likely to oppose reforms (Vagliasindi 2013).
575 From this perspective, introducing fuel efficiency standards for new cars could be an important first
576 step to prepare the ground for future fossil fuel subsidy reform (Meckling et al. 2015). Even though
577 efficiency standards can be cost-efficient for moderate emissions reductions (Goulder, Hafstead, and
578 Williams 2016), their costs are well above those of market-based instruments for more stringent
579 reduction targets (Parry, Evans, and Oates 2014). The increased economic costs associated with fuel
580 efficiency standards may well exceed their advantages in terms of political feasibility related to the
581 distribution and visibility of costs. For this reason, efficiency standards are unlikely to be sufficient for
582 ambitious climate change mitigation, especially in the presence of substantial subsidies for gasoline
583 and diesel, but they can provide an entry point for the implementation of additional measures in the
584 future.
585 As stated by one interviewee, in Ecuador the most common approach to deal with a distortionary
586 subsidy is not to remove it, but to introduce a countervailing subsidy. An example of such a 'hybrid
587 policy' (Lockwood 2015) would be subsidizing electric vehicles, e.g. by exempting them from import
588 tariffs. Even though this idea has been mentioned by several interviewees, it should be noted that the
589 associated loss of public revenues could be a powerful counter-argument, especially in the current
590 economically difficult situation. The withdrawal of subsidies for hybrid vehicles and FiTs for renewable
591 energy (see Section 5.2) suggests that this approach can be expected to be fraught with difficulties. A
592 hybrid strategy combining fossil subsidy reform with financial support for a substitute could increase

political feasibility while at the same time minimizing pressures on the public budget (Matsuo and Schmidt 2017). Expanding public transport could support the transition to sustainable mobility. In this regard, the adoption of a bus-rapid-transit system in Quito is judged to be a success, whereas the construction of a metro line, initially scheduled to be operational by 2016, is plagued by delays and cost over-runs (El Comercio 2014a).

7. Conclusions

This paper has argued that even though Ecuador's climate targets are an important signal, they do not yet constitute a credible entry point for a long-term strategy of economic transformation. This is especially salient for the transport sector, which has displayed rapid emission growth in recent years, mostly due to sizable subsidies for gasoline and diesel.

Category	Barriers	Entry points
Design of rules	Lack of legislation Politicized energy policy Automatic stabilizers for subsidies	Link with other policy objectives Capacity building, ownership Results-based payments
Transparency and trust	Inaccurate data Frequent policy reversals Lack of civil society involvement	Capacity building Climate finance Existing stakeholder mechanisms
Political economy and distribution	Insufficient information on impacts Cash transfers Provisions against earmarking	Carry out distributional studies Lower taxes, Invest in education Block-pricing schemes
Robustness	Fragmented policies Contradictory goals Sequencing of policies	Reform of driving restrictions Increasing public transport Efficiency standards Subsidies for electric cars

Table 3: Summary of entry points for long-term climate policy and feasible mitigation options.

The major barriers to credible climate policies as well as politically feasible entry points are summarized in Table 3. The characteristic feature of these climate change mitigation options is not that they achieve emission reductions in the short term, but first and foremost their potential to relax the underlying political economy constraints to prepare the ground for more stringent climate

610 measures in the future. Pragmatic policies, such as reforming driving restrictions, increasing the supply
611 of public transport, introducing vehicle efficiency standards and providing support for electric vehicles
612 could support the transition towards a low-carbon economy. The distributional consequences of such
613 policies will be of crucial importance for their viability. Effective compensation schemes to protect low-
614 income groups could be devised by lowering other taxes, scaling up investment in education, and
615 increasingly relying on block-pricing schemes. Results-based payments could be a promising option to
616 provide financial incentives for emissions reductions and pave the way for carbon pricing on the
617 national level. In order to ensure that these payments incentivize those activities that are most
618 desirable from a social perspective, their interrelation with other policy objectives (such as local air
619 quality and energy security) needs to be accounted for. The international community can play a role
620 in supporting the build-up of administrate capacities to carry out monitoring, reporting and verification
621 to ensure transparency and hence raise policy credibility. In addition, increased participation of key
622 stakeholders, e.g. by means of prior consultations, seems necessary to anticipate public opposition
623 against climate-related policies and increase the buy-in of the affected population.

624 On April 2, 2017, Lenín Moreno from the ruling party Alianza País clinched a tight victory to become
625 Ecuador's next president in a runoff with Guillermo Lasso of the center-right conservative Creo party.
626 What stance the incoming government will take on climate and energy issues remains to be seen.
627 Regardless of the outcome of the election, economic circumstances will crucially determine the new
628 government's policy space. On the one hand, it can be argued that the recent economic downturn
629 increases the pressure to enact economic reforms. On the other hand, in the face of economic hardship
630 such reforms may face fiercer opposition from the population. Case study evidence suggests that the
631 large majority of fossil fuel subsidy reforms were undertaken in times of economic growth (IMF 2013).
632 In any case, as indicated by several interviewees, reform of energy policies, especially fossil fuel
633 subsidies, will need to be phased in gradually and embedded in a broad fiscal reform package that
634 ensures that energy price increases do not result in adverse impacts on the poorest segments of society
635 and yield visible benefits for a broad majority of the population.

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Appendix: List of interview partners

Unless otherwise noted, the interviews were carried out in April and May 2016 in Quito in Spanish on a face-to-face basis. Quotes provided in the main text of the paper were translated into English by the author. We carried out semi-structured interviews of 45-60 minutes with stakeholders from government, civil society, academia, and the private sector. Interview partners were selected to get a sufficiently broad set of different perspectives and expertise (e.g. related to energy, climate change, public finance and development issues). For each interview, a set of questions was prepared in accordance with the interviewee's professional background. For this reason, different interview partners were in general asked different questions. As a consequence, the interviews are not amenable to coding and quantitative analysis, but should rather be regarded as a qualitative device to gather expert knowledge and their assessment of key issues related to climate and energy policy. The interview questions are described in the supplementary online material.

Interviewee	Affiliation	Date
José Jurado *, §	Ambassador of Ecuador in Berlin, Germany (at time of interview)	November 12, 2015
Fabian Englert, Nadia Manasfi §	Gesellschaft für international Zusammenarbeit (GIZ)	April 7, 2016
Freddy Moreno, Cesar Vaca	Instituto Nacional de Energías Renovables (INER)	April 8, 2016
Maria Dolores Almeida	Former Vice Minister of Finance	April 9, 2016
Rabea Weis §	Gesellschaft für international Zusammenarbeit (GIZ)	April 12, 2016
Daniel Zabula	Secretaría Nacional de Planificación y Desarrollo (SENPLADES)	April 13, 2016
Ana Maria Nuñez	United Nations Development Program (UNDP)	April 14, 2016
Christian Parra	Ministerio del Ambiente (MEA)	April 14, 2016
Nicolás Oliva, Pilar Reyes, Maria Eugenia Andrade	Servicio de Rentas Internas (SRI)	April 14 2016
Gustavo Endera	Friedrich-Ebert-Stiftung (ILDIS)	April 15, 2016
Alfredo Mena	Cooperación para la Investigación Energética (CIE)	April 18, 2016
Lore Velazco, Juan José Herrera	Grupo Faro	April 20, 2016
Melani Pelaez §, #	University of Freiburg, Germany	April 23, 2016
Lisseth Moreira	Ministerio de Agricultura (MAGAP)	April 27, 2016
Sebastián Cárdenas Medina	Centro de Planificación y Estudio Social (CEPLAES)	May 6, 2016

*Table A 1: List of interview partners. *: Interview carried out in Berlin. §: Interview carried out in German. #: Interview carried out via telephone.*

Supplementary Online Information: Example of interview questions

An example of questions being asked during such an interview is listed below. We took care to offer the possibility to deviate from the prepared questions in any occasion in which interviewees had relevant information that we had not anticipated.

Interview questions:

1. General

- What are in your view the most pressing issues Ecuador faces at the moment?

- What are in your view the most important issues related to the environment and climate policy?

2. Public Budget

- What are the main reasons for the looming budget deficit?

- What can be done to address the budget deficit?

- If the oil price remains low, which sources could make up for foregone public revenues?

- What are the main areas to cut spending, and where will additional public spending and investment be needed?

3. Climate Policy

- What are the main reason for Ecuador to reduce emissions?

- What is the role of co-benefits (clean air, energy security etc.) in the public discussion?

- Which areas offer the highest potential for cost-effective emission reductions?

- Which measures are envisaged to realize Ecuador‘s emission reduction targets?

- What are the costs of emission reductions, and who how should they be distributed?

- What kind of support from the international community is required/expected?

- Who are the main proponents and opponents of climate policy, and what is the balance of power between them?

- How are market-based policy instruments regarded in the political arena, and what could be their legal basis?

4. Subsidy Reform

- What were the reasons behind the announced reduction of subsidies for diesel, gas, and electricity?

- Do you think it is likely that these reforms will actually be implemented?

- How do you evaluate the current political climate with regards to subsidy reform?

- How have these reforms been communicated?

- Which groups were in favor, and who was against?

- Which measures have been adopted to compensate losers?

- How have subsidy reforms been perceived by the population?

- Do you think there may be further steps to reduce fossil fuel subsidies in the near future?

- Which conditions would need to apply to make further reforms politically feasible?

5. Carbon Pricing

- Do you think carbon pricing would be a feasible option to reach national emission targets?

- What would a carbon price of 10, 20, 30 US$/$tCO_2$ mean for the average Ecuadorian?

- What would be the most appropriate use for revenues? Reduction of other taxes, or targeted public spending on e.g. social programs?

- Who would promote and who would resist a carbon price?

- What could be done to make a carbon price politically feasible?

- What would need to be done before introducing a carbon price?

- What problems would you expect, and how could they be circumvented?

- Which lessons can be learned from tax on automobiles?

- What is the interplay with other policies, and which coordination is necessary?