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National climate policies in international comparison: The Climate Change Cooperation Index

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ABSTRACT

Valid and reliable measurement of countries' climate policy performance is important both for policy-making and analytical purposes. The authors contribute to this end by introducing a new dataset that offers such information for up to 172 countries for the time period 1996–2008. Their *Climate Change Cooperation Index* (C3-I) captures overall performance as well as performance in terms of political behavior (output) and emissions (outcome). The C3-I, thus, allows for a systematic global comparison of countries' climate policies. The paper also compares the C3-I with its most relevant alternative, the *Climate Change Performance Index* (CCPI) by Germanwatch.

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1. Introduction

Since the early 1990s, the international community has made some, albeit far from sufficient progress toward reducing greenhouse gas emissions and mitigating their impact on humankind and ecosystems. Meanwhile, it has become increasingly apparent that policies to that end differ strongly across countries and over time, both in terms of form and the de facto contribution to the global public good of “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system” (United Nations Framework Convention on Climate Change (UNFCCC), Art. 2).

A large body of literature describes and assesses the climate policy efforts of individual states or small groups of countries (e.g., Reiche, 2010; Victor, 2006; Yamin and Depledge,

2004). Although these studies provide important insights, broader international comparisons focusing on a large set of countries over a relatively long period of time might allow for even more systematic and far-reaching conclusions (e.g., Bättig and Bernauer, 2009; Bättig et al., 2008; Böhmelt, 2012; Burck and Bals, 2011). More specifically, it appears crucial to know – both from the perspective of policy-makers and scholars – which countries, in descriptive terms, are “leading the effort” and which ones are “lagging behind.” Furthermore, in analytical terms, comparing a large number of states and their policies over time has the potential to produce more generalizable inferences with respect to the factors that are conducive to more ambitious mitigation efforts.

One major obstacle to large-scale comparisons of states' climate policies is insufficient data. Most of the existing analytical work simply uses greenhouse gas emission levels and/or rates of change to compare states. This approach does

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not fully capture a country's overall climate policy performance; focusing on emissions does not automatically tell us how strict or ambitious the climate policy of a given country is, since emissions are also affected by factors other than policy (e.g., economic developments or the weather). Moreover, other scholars have measured climate policy performance by examining how fast countries ratified the UNFCCC and/or the Kyoto Protocol (e.g., Fredriksson and Gaston, 2000; Neumayer, 2002a,b; Bernauer et al., 2010). This approach ignores the emissions component and, hence, it cannot capture the overall climate policy efforts of a country either.

Thus far, we are aware of only two datasets that offer information both on emissions and on policy efforts for a large number of countries: the Climate Change Performance Index (CCPI) by the non-governmental organization and think-tank Germanwatch (Burck and Bals, 2011), and the Cooperation Index (CI) by Bättig et al. (2008). As we will outline in greater depth below, the CCPI is based on data for emission trends, emission levels, and climate policy. The CI has a cross-section format, is available for 198 countries, and is based on aggregated data for the time period 1990–2005.

In light of this, we have developed a new dataset that adds to these existing efforts. This *Climate Change Cooperation Index* (C3-I) builds on the measurement concept of the CI and seeks to address countries' overall climate policy performance as well as performance in terms of political behavior (output) and emissions (outcome). In its current form, it covers up to 172 countries for the time period 1996–2008, but can also easily be extended. The C3-I, thus, allows for the systematic global comparison of states' climate policy performance. In order to demonstrate the potential and usefulness of this new index, we also compare the C3-I with its most relevant alternative, the CCPI (Burck and Bals, 2011).

The paper proceeds as follows. The next sections describe the main conceptual differences between the CCPI, the CI, and, against this background, introduce the C3-I. We then compare and contrast those countries and years that are simultaneously covered by the CCPI and C3-I. To illustrate how one or the other index can affect the findings of empirical research, we also discuss the results of a simple analysis on the effect of democracy on countries' climate policy performance. We finish the article by highlighting the differing advantages and disadvantages of the two indices and by discussing policy recommendations as well as avenues for further research.

2. Conceptual differences between the CCPI and the CI

The CCPI offers times-series cross-section data for up to 58 countries over the time period between 2005 and 2011, with an increasing country coverage over time. For example, the first CCPI for the year 2005 comprises data for 53 countries; the subsequent index for 2006 already covers 56 states. The latest version of the CCPI offers data for 58 countries “that together are responsible for more than 90% of annual worldwide carbon dioxide emissions” (Burck and Bals, 2011, p. 4), i.e., the main criterion for case selection is a country's level of carbon dioxide emissions. In total, this index relies on 13 indicators, 11 of which measure emission levels and trends, and two of

which assess national and international climate policies (Burck and Bals, 2011). These indicators are then aggregated into the overall CCPI measure. In this aggregation process, the weights given to the three categories of indicators are 50%, 30%, and 20%, respectively. The rationale behind those weights is to avoid an overly generous treatment of countries that make (substantial) improvements, but actually start(ed) from a comparatively low or poor performance level in the first place (Burck and Bals, 2011, p. 5). Fig. 1 illustrates the composition of the CCPI. While the emission level and trend indicators used for the CCPI are taken from third-party sources (primarily the International Energy Agency), the policy components of the CCPI are based on expert assessments solicited by Germanwatch. The overall index places countries within the interval [0; 100], where higher values indicate more “climate friendly” behavior. As Burck and Bals (2011, p. 6) note, any individual score “indicates climate performance relative to that of other countries.”

Like the CCPI, the original CI (Bättig et al., 2008, p. 480ff) is composed of indicators on emissions and states' policy behavior. It uses aggregated average data for 1990–2005 and differs conceptually from the CCPI in important ways. On the policy side, it relies on rather easily and objectively observable phenomena, rather than expert assessments. These policy phenomena are summarized in Table 1. Higher values on each of these indicators indicate more cooperative political behavior in terms of contributing to the global environmental public good.¹

On the emissions side, the CI compares emissions against an emissions trajectory, i.e., a fitted environmental Kuznets curve (Seleden and Song, 1994; Grossman and Krueger, 1995) that serves as a benchmark. Here, the CI's emissions part uses two components: 1990 levels of CO₂ emissions per capita in relation to GDP per capita; and the trend of CO₂ emissions per capita in relation to GDP per capita between 1990 and 2002. The rationale behind this approach is that per capita CO₂ emissions should be allowed to develop differently depending on the economic situation of a country. As Bättig et al. (2008, p. 480ff) emphasize:

“A developing country should have the possibility to increase its per capita emissions during economic growth. In contrast, a developed country should have the responsibility to invest in cleaner, more efficient technology and renewable energies, and, thus, stabilize and reduce its per capita emissions. To assess countries in this sense, per capita CO₂ emission levels and trends were evaluated with respect to an environmental Kuznets curve, which describes the relationship between economic development and emissions, and is assumed to first increase and then decrease as a function of income.”

¹ Note already here that the policy component of the C3-I that we will be presenting below differs from the CI as discussed here. Bättig et al. (2008) categorize membership in the UNFCCC and the Kyoto Protocol as “commitment to common goals” and all other indicators as “implementation of measures.” However, we will treat two of the four “implementation of measures” components of the CI as policy indicators (reporting and financial contributions under the UNFCCC).

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