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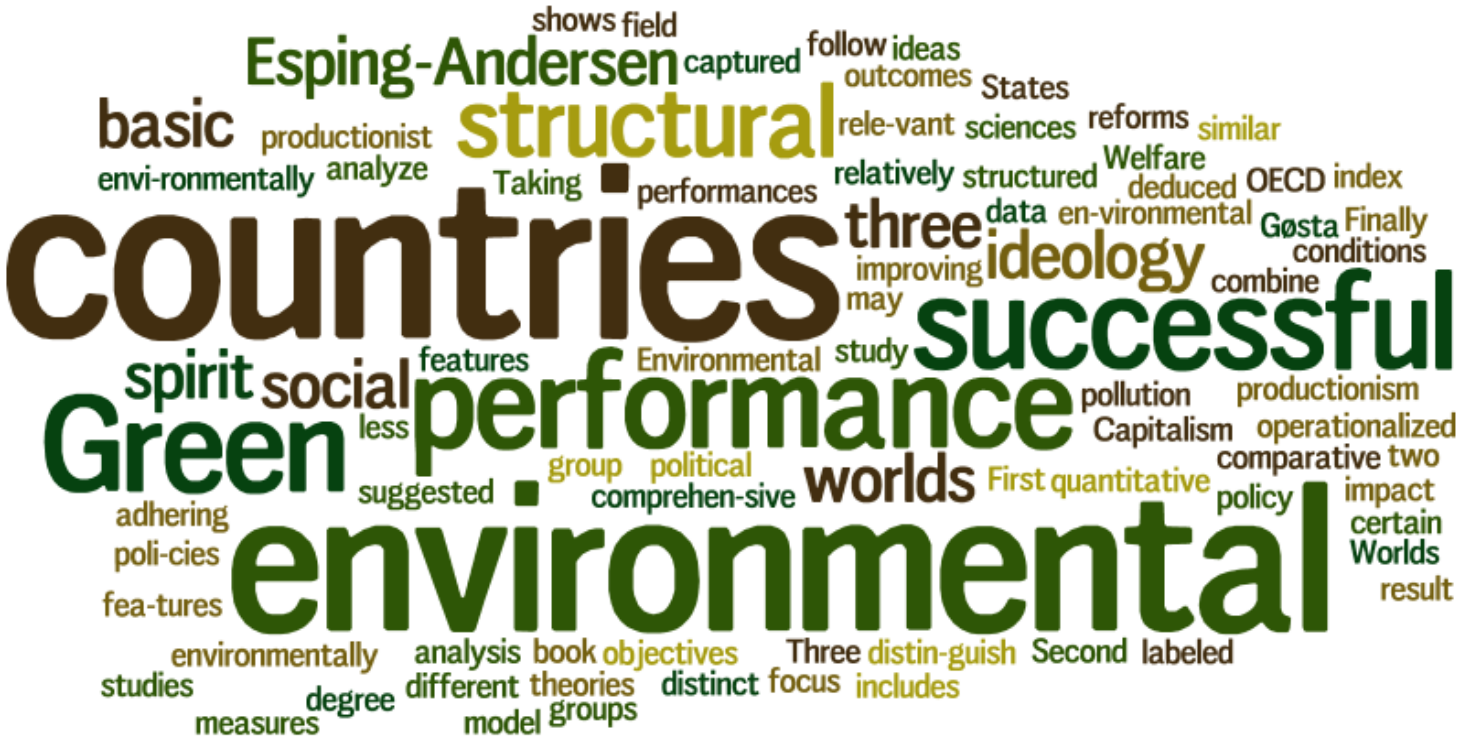

Detlef Jahn

The Three Worlds of Environmental Politics

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The Three Worlds of Environmental Politics [1]

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Abstract

Very few studies in comparative social sciences have had such an impact as Gøsta Esping-Andersen's book "The Three Worlds of Welfare Capitalism." In the field of social policy, he suggested that there are three distinct groups of countries. Taking Esping-Andersen's study as a model, I analyze the outcomes of environmental policies of 21 OECD countries in a similar spirit. I focus on basic environmentally relevant structural features and environmental performance. The basic structural features are deduced from theories of Green political ideology and operationalized with quantitative data. Environmental performance is captured by a comprehensive index which includes environmental pollution and measures of improving environmental conditions. The result of such an analysis shows that we may distinguish between three different worlds. There are two worlds of relatively successful environmental performances. First, some countries more or less follow the ideas of Green ideology. These countries combine a successful environmental performance with structural reforms adhering to Green objectives. To a certain degree, such countries can be labeled "Green States." Second, there are countries that are environmentally successful, but are structured in the spirit of productionism. Finally, there is a group of countries that is productionist and which is not successful in their environmental performance.

Keywords: environmental politics, environmental performances, green states

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1 Introduction

The classification of states as "Green States" has received increasing attention in recent years.[2] However, it is difficult to find criteria by which to group countries in the category of Green or non-Green states. Moreover, to what extent states with successful environmental policies build or possess a social structure that supports environmental success is an even more difficult question to answer. The ability to connect policy outcomes and social structures is the strength of Gøsta Esping-Andersen's analysis of welfare states. Through analyzing social structures, he found that welfare states cluster into three groups: liberal, corporatist and social-democratic welfare states. These clusters correspond with the level of decommodification as an outcome of welfare policies. Decommodification is defined as the "degree to which individuals, or families, can uphold a socially acceptable standard of living independently of market participation" (Esping-Andersen 1990: 37).

Constructing a similar typology in the field of environmental policy needs to consider at least two important aspects. First, it has to identify how states perform in environmental policy. Like Esping-Andersen, I identify variance in performance by comparing the *outcomes* of environmental policies in highly industrialized democracies. In this view, environmental performance is equivalent to decommodification in welfare state research. The second aspect must consider structural developments that have an environmental impact within highly industrialized countries. Esping-Andersen studies the social stratification of welfare states which roughly follow the distinction between major political ideologies of industrial societies: liberalism, conservatism and socialism (Bobbio 1996). In order to render this conceptualization useful for environmental research, I will likewise need to differentiate between ideological approaches to industrial societies while incorporating a Green component. For such an undertaking, I refer to the theoretical literature on Green politics which distinguishes between a productionist and a Green paradigm of social development.

This research design reveals which states are Green states and which are not, as well as distinguishing between successful and less successful environmental outcomes. On the one hand, the design identifies environmentally successful states that are in line with Green ideological principles and, on the other hand, states with suc-

[2] Martin Jänicke (2008) summarizes the debate on the "Eco-State" (*Umweltstaat*), which has its roots in the 1980s (Kloepfer 1989). This debate is extensive and increased in volume in the late 1990s and into the new millennium (Dente 1998; Mol and Buttel 2002; Dryzek et al. 2003; Eckersley 2004; Christoff 2005; Meadowcroft 2005; Spaargaren et al. 2006; Eisner 2007; Duit 2009). Most of these studies focus on the institutionalization of ecological principles in various areas of polity and policies. However, even if some draw parallels between the development of the welfare state and the Eco-State (see above all Meadowcroft 2005) they do not refer explicitly to the programmatic claims of Green ideology, such as I will do in this paper.

cessful environmental performance that nevertheless adhere to productionist-oriented policy principles. Finally, it describes less environmentally successful states which are productionist. Of course, it might be possible that states attempt to follow a Green paradigm but are not environmentally successful. However, that would not be a result of policies but special and exogenous environmental circumstances.

The article is structured in three parts. First, I analyze the environmental performance of 21 OECD countries. Second, I distinguish the degree to which these 21 OECD countries have structural features which are consistent with Green ideology. Needless to say, all established industrialized countries have inherited productionist paradigms, but some have come to gradually embrace more Green-oriented structural features. Third, I combine the two dimensions. This analysis leads to the identification of three worlds of environmentalism among the most highly industrialized states in the world.

2 Environmental Performance in 21 OECD Countries

To facilitate classifying states in terms of their environmental status and achievements, I will focus on their performance in respect to key issues of environmental policy. In order to do so, the term performance must be defined. There are several aspects constituting performance in general and environmental performance in particular. In general, the concept of performance is evaluative and has been utilized in political science since the 1970s (Dahl 1967; Gurr and McClelland 1971; Eckstein 1971). The evaluation can be done in comparison to a pre-set target or baseline, on the one hand, or relative to other cases or time-periods, on the other (Eckstein 1971: 8). In terms of environmental performance, the difficulties presented by the former measure relate to a lack of clearly defined and universally accepted targets concerning the abatement of environmental degradation or achievements.[3] Therefore, I focus on the comparative approach. However, a relative comparison needs comparable cases (Lijphart 1975) and I therefore decided to restrict this analysis to the 21 most advanced and democratic OECD countries.

Environmental performance in particular needs to meet further criteria that have often been neglected in environmental analysis:

- Environmental problems have to be *obvious to political actors*. Political actors can only react to problems that are known to them. This does not mean that we need scientific proof that certain problems are environmental problems. It is enough that problems might be environmentally harmful and their impact on human life is thus publically debated.
- Environmental performance indicators must correspond to aspects that can be *influenced by political action*. Emissions from volcanic activity -- though having substantial consequences for atmospheric emissions -- cannot be included in a performance measure. On the other hand, it is more difficult to argue that environmental disasters should not be taken into account. Environmental disasters often occur because politicians do not introduce effec-

[3] This is even true for Climate Change Policy where political actors introduced set targets. However, these targets were strongly disputed and, over time, frequently revised (Gupta 2010).

tive regulatory instruments. However, in this investigation, I am interested in the impact of politics on regular environmental performance and therefore exclude environmental disasters from the analysis.

- For an index of environmental performance, it is important to note that accumulated measures are difficult to use since they can only be changed in the long run. This means performance indicators should focus primarily on *changes* in outcome and only secondarily on levels. The latter is of course important because levels define the precondition for changes.
- Performance is a typical *outcome* variable. While the introduction of an environmental policy intends to reduce pollution, the empirical proof of its effectiveness can only be measured by the outcomes of a policy. That means that, measures of performance must integrate the implementation stages into the analysis.
- A performance measure must account for *other factors* which might be responsible for the outcome. There might be a host of such factors such as geographical conditions, technological development and innovations, change in economic cycles, international pressures, etc. While I argue that climate conditions and industrial structure are most important, the others factors also need detailed causal analysis.
- Finally, performance measures need to be *comparable over time and across countries* while accounting for the fact that some environmental issues are more important in one country than in another.

There are a few existing indices that consider environment conditions in various countries. Pioneering studies in political science have been conducted by Crepaz (1995), Palmer (1997) and Jahn (1998). Crepaz analyzed some indicators of pollution but fell short of aggregating them into an environmental performance index. Palmer constructed a composite index based on CO2 emissions, fertilizer consumption, and deforestation. Jahn subsequently developed one of the first comprehensive environmental performance indices in political science. He considered air emissions, municipal waste, fertilizer consumption, hazardous waste and protected areas. While Crepaz uses several indicators of air emission levels individually, Jahn uses an index that includes levels and changes as a performance index. In his study of 18 OECD-countries, Jahn concluded that the Netherlands, West Germany, Austria, and Sweden had the highest environmental performance in 1990. The USA, Italy, Canada, and Ireland were laggards in his study. Lyle Scruggs (2003), who has written what is thus far the only book-length study of environmental performance of OECD countries in macro-comparative politics, uses almost all of Jahn's indicators, but he exclusively analyzes changes from 1975 to 1995. According to his index, Germany ranks first of the 17 OECD-countries analyzed, followed by Sweden, Denmark, and Austria. The USA, Canada, and Spain are the countries with the lowest environmental performance, followed only by Ireland with the worst performance. In her very comprehensive study of performance in 21 established OECD-countries, covering the fields of domestic security, social, economic, and environmental policy, Edeltraut Roller (2005) uses the levels of air emissions, municipal waste, fertilizer consumption, and fresh water abstraction. She offers indices for 1974-9, 1980-4, 1985-9 and 1990-5, as well as an aggregated index from 1974 to 1995. For 1990-5 she reached the conclusion that Switzerland, Sweden, and Austria perform best. Contrary to most

other studies, she finds that Portugal and Greece follow in the 4th and 5th rank respectively. Over the entire time period Portugal rather surprisingly places second. This result is a likely consequence of the fact that she measures only pollution levels and fails to incorporate relative change. Belgium, Australia, Canada, and above all the USA place at the bottom of her list. All of these studies use indicators that can be influenced by political actors and use the comparable cases approach by analyzing highly industrialized democracies. Therefore, all satisfy most of the criteria for environmental performance spelled out above. However, they fall short due to an exclusive reliance on cross-sectional analysis.[4] Furthermore, none of the indices control for geophysical or structural differences between countries. However, there are also environmental performance indices outside political science that I would like to introduce for this article -- two in particular.

The first is the Environmental Performance Index conducted by the World Economic Forum, which has been published for 2006, 2008, and 2010 (Esty et al. 2006; Emerson et al. 2010). This index is composed of various indicators measuring ecosystem vitality and environmental health. The index began in 2006 by covering 17 countries, but was expanded in 2010 to include 163. Each time the index was substantially revised so that "… it is important to note that owing to changes in the data and methods used in 2010 …, the results cannot be directly compared to the 2008 or 2006 Pilot EPIs" (Emerson et al. 2010: 63). The 2010 index ranks 163 countries on 25 performance indicators. The top ranked countries for environmental performance are Iceland, Switzerland, Costa Rica, Sweden and Norway. At the bottom are Angola, Mauritania, Central African Republic, and Sierra Leone. The USA, Poland, Greece, and above all Belgium have the poorest environmental performance within the OECD. The EPI of the World Economic Forum uses set targets in order to identify country-specific environmental performance. However, it is not always clear if the targets are similarly binding on political actors. An inability to conduct analysis over time is a further drawback of this index. In fact, the measures refer to the latest available data for any given country, subsequently presenting significant difficulties in determining which actual year the data refers to.

The Ecological Footprint Index is the only index suitable for a multi-country, time-series analysis (Wackernagel et al. 2002). This index weighs the biocapacity of a country with man-made impacts on the environment (ecological footprint). The biocapacity is, for instance, high in countries with great biodiversity and a short history of industrialization, such as New Zealand and Australia. The United Kingdom and many other European countries have a low biocapacity. The relation between biocapacity and ecological footprint is expressed by an index of ecological deficits. This means that the footprint is greater than the biocapacity. The worldwide ecological deficit is (.8), meaning that the ecological footprint to biocapacity ratio was 1.3 in 2005. This in turn suggests that humans use the resources of 1.3 worlds. The highest ecological deficit exists in the desert oil states Qatar, Kuwait, and above all the United Arab Emirates. In the OECD world, Japan, Spain, Belgium, Greece, and the United Kingdom had the highest ecological deficits in 2005. Countries with the best

[4] Crepaz pools two time points. However, he does not really conduct a time-series--cross-sectional analysis. This was done later for individual indicators of air emissions by Eric Neumayer (2003a). Roller (2005) compares four time periods. However, she does not conduct a pooled data analysis.

balance between biocapacity and ecological footprint are Congo and above all Bolivia. The leading OECD countries are Australia, Canada, Finland, and Sweden. For the 21 established OECD countries, the ecological footprint to biocapacity ratio was 2.4 in 2005. In political science, this index has been used by Lane and Ersson (2003) for instance. Although the Ecological Footprint indicator is the only environmental indicator suited for time-series--cross-section analysis from 1960 to 2009, it has some deficiencies for this analysis. First, the methodology is not very transparent and replication is probably not possible. Second, biodiversity plays a great role in the index. This does not meet the criteria for performance since it deals with an aspect that is difficult to influence by political action – at least in the short- or medium-term.

Because all established indices contain substantial deficiencies for this analysis, I decided to develop my own Environmental Performance Index (EPI). I analyze environmental performance by referring to OECD data. The advantage of using OECD data derives from its public availability and that it covers all OECD countries over an extended time period. In addition, to ensure that the indicators were comparable, the OECD homogenized the data by consulting their member states. This does not solve all problems, as can be seen by the extensive footnotes in OECD publications, but the data of the OECD comes closest to being a valid and reliable comparative data set of environmental indicators.[5]

In order to obtain a comprehensive index for the environmental performance of 21 OECD countries, I utilize 14 indicators. These indicators are documented in the Environmental Data Compendia of the OECD and they allow for a time-series--cross-sectional analysis from 1980 until 2005. Furthermore, these indicators meet most of the requirements outlined for environmental performance above. In order to take factors into account which are not a result of political action, I controlled for climate and structural changes.[6] To discover the latent dimensions of the 14 indicators, I conducted a principal component analysis of the pollution and environmental abatement levels over all the years and extracted three factors which yield a distinct pattern.[7] For the most part, the variables fit well into the factor model. However, the variable 'nuclear waste' is problematic due to high uniqueness. The results of the rotated factor analysis are presented in Table 1:

[5] In this context, it is important to note that the more important environmental data have become for society and politics, the more difficult it has been for the OECD to compile a comparable data set. That is because country administrations are afraid of negative sanctions if their country performs poorly in comparison to other countries. This even led to an interruption after 2004 in the regular bi-annual rhythm of publication that existed from 1987 to 2004 (results from interviews with OECD official, for further information on environmental performance reports see Lehtonen 2007). Currently there is no longer any regularly appearing publication on environmental data by the OECD.

[6] This was done by using the predicted values of a regression analysis which included the Heating or Cooling Degree Months for each year and country (see Jahn 2011) and the significant industrial sectors. This was done for all indicators except recycling rates and connection to waste water treatment systems.

[7] I use an orthogonal varimax rotation here, although other kinds of rotation reach very similar results. The first factor explains 51 percent of the variance, the second 23 percent and the third almost 16 percent. Overall, the factor analysis explains more than 90 percent of the variance. The eigen-values of the factors amount to 4.95, 2.26, and 1.51.

Table 1: Dimensions of Environmental Performance in 21 OECD Countries

Variable	*Factor1*	*Factor2*	*Factor3*	*Uniqueness*
Sulfur Emissions	0.7653			0.2635
Nitrogen Emissions	0.9516			0.0941
VOC Emissions	0.8442			0.2318
Carbon Monoxide Emissions	0.9206			0.1301
Carbon Dioxide Emissions	0.8277			0.2658
Municipal Waste	0.5213	0.4892		0.4848
Nuclear Waste	0.3285			0.8333
Fresh Water Abstraction	0.7044			0.4474
Glass Recycling		0.7669		0.3008
Paper Recycling		0.8123		0.3006
Connection to Sewage		0.7777		0.3601
Fertilizer Consumption			0.5735	0.6025
Rivers Pollution			0.7251	0.4299
Lakes Pollution			0.6549	0.5275

Explanation: Principal component analysis with orthogonal varimax rotation. A cut-off point of < 0.328 was chosen so that each variable had at least one loading on one of the three factors.

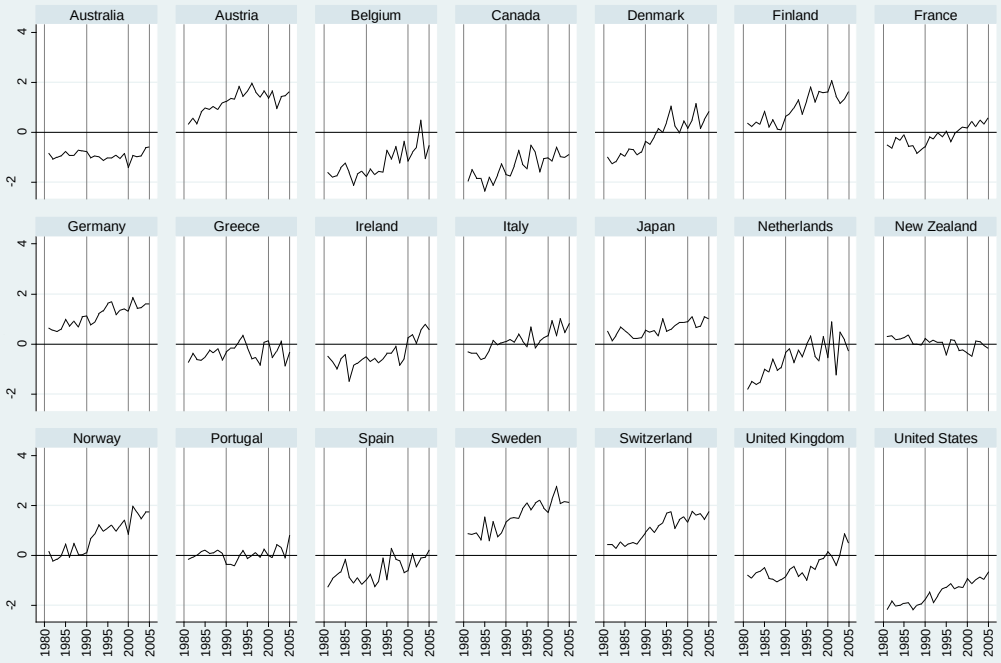
The first factor gathers variables which represent *general environmental contamination*. This factor had particularly high loadings for all air emission indicators. Yet, other environmentally harmful indicators loaded on the first factor as well. Among these are fresh water abstraction, nuclear waste, and municipal waste. The second factor can best be interpreted as an *environmental relief factor*. In addition to the connection to water purification plants, paper and glass recycling also explicitly load on this factor. The last factor captures *water pollution*, which primarily comprises the contamination of rivers and lakes. The variable for use of fertilizer fits into this factor well, as fertilizer-intensive agriculture results in water pollution. Therefore, the third factor assembles both the indicator for the cause of contamination (use of fertilizer), as well as the indicator for water pollution in rivers and lakes.

For the purpose of this article, I create a composite indicator of Environmental Performance (EPI = Environmental Performance Index). I create this index by adding general and water pollution performance indicators, then subtracting environmental relief from this number. A matter of concern is the question of how to treat the level of pollution in relation to changes. Is a country a better performer when it reduces its environmental impacts even if the reduction is from a very high initial level (Scruggs' approach)? Or is better performance best captured by the level of environmental degradation (Roller's approach)? As outlined above, authors have dealt with this issue very differently and one can find good reasons for all approaches. I will follow my own research tradition (Jahn 1998) by combining level and change. I weigh changes double as high as levels. In order to do so, I standardized both variables (level and change) between 0 and 100.

This EPI concludes that over the last five years (2001-2005) Sweden is the best performing country. Sweden is firmly established in the top group of countries and

is the leading country for most of the period covered in this analysis. Other countries in the top group are Norway, Switzerland, Germany, Finland, and Austria. Like Sweden, these countries perform well on environmental indices over the whole period of analysis. Further countries with an above average balance sheet of environmental performance are Japan, Denmark, and Italy. On the other hand, Greece, Belgium, Australia, the United States, and above all Canada are at the bottom of the league.

Figure 1: Environmental Performance in 21 OECD-Countries (1980-2005)



The overall index indicates no clear and uniform developments (see figure 1). Most obvious is the clear positive trend in Sweden, Switzerland, and Germany. Finland and Norway are late comers because their positive balance sheet started in the 1990s. The positive trend in Ireland and the United Kingdom started even later in the late-1990s or early 2000s. Austria was a leader until the late 1990s, thereafter environmental performance decreased. Also positive trends emerge in Denmark, Belgium, the Netherlands, Canada, and the United States, although commencing from a much lower starting point. In Japan, Italy, and Spain, the trend is also positive but much weaker than the other above-mentioned countries. Australia, Greece, Portugal, and New Zealand lag in environmental performance. New Zealand is in fact the only country with a negative trend over the period of analysis. In the early 1980s, New Zealand belonged to the top group of environmental performers; at the beginning of the new millennium, it fell into the last third.

Comparing the index developed here to the other indices mentioned above offers a validity check. In addition, I also compare it to the Environmental Sustainability Index (ESI) of the World Economic Forum (Esty et al. 2005). This index measures the state of the environment in several countries and is comparable to the Ecological

Foot print index.[8] These two indices are not performance indices but rather aim to grasp the state of the environment in every country. That means that my index should not have a high correlation with these two indices. Table 2 reports the correlation coefficients (Pearson's r) for all the indices.[9]

Table 2: Correlation between Various Environmental Performance Indices

	Foot-print	*Econo-mic Forum' ESI*	*Econo-mic Forum' EPI*	*Scruggs' EPI*	*Roller's EPI*	*Palmer's EPI*	*Jahn' 1998 EPI*
EPI (new)	0.23	0.59	0.82*	0.63	0.75*	0.14	0.70*
Footprint		0.35	0.20	0.11	0.58	0.48	0.28
Economic Forum' ESI			0.53	0.36	0.21	0.68	0.28
Economic Forum' EPI				0.23	0.31	0.51	0.08
Scruggs' EPI					0.29	-0.25	0.81*
Roller's EPI						-0.12	0.48
Palmer's EPI							0.41

Explanations: * Bonferroni-adjusted significance levels of < .05 or less.

The results show that the EPI developed in this article correlates to a significant degree with all other indices that focus on environmental performance. This is particularly true regarding the EPIs of Scruggs, Jahn 1998, Roller, and above all of the World Economic Forum. Only Palmer's EPI has a lower correlation. However, his index seems to be more a "state of the environment index" than an EPI. EPIs also correlate highly among each other, leaving out only Roller's EPI. It also shows that the two indices that measure the state of the environment do not correlate with the performance indices to any significant degree. This correlation matrix provides evidence that my index measures what it is suppose to measure: environmental performance in 21 OECD-countries.

3 Environmental Regimes in 21 OECD Countries

In Esping-Andersen's (1990) analysis of the welfare state, regimes are the complex of legal and organizational features in the interwoven relation between the state and the economy. He measures this by looking at policy outcomes (social spending, salience of mean-testing, emphasis on private social insurance, etc.). As a result, he identifies three welfare state regimes that correspond to established political ideologies: the liberal, the conservative, and the social democratic. According to Esping-Andersen, each of the 18 OECD countries he examines fulfills all criteria, but only to various degrees. The Nordic States and the Netherlands are social democrat-

[8] According to the ESI index, Canada, Iceland, Sweden, Uruguay, Norway and above all Finland are leading. Germany is 31st just before Namibia and Russia. At the end of the list are North Korea, Taiwan, Turkmenistan and Iraq. At the end of the list of the OECD-countries are the United Kingdom, Italy, Greece, Spain and above all Belgium.

[9] In conducting the correlation analysis, if an index had more time points and periods than the other to which it was compared then the closest years between the indicators were used. For our EPI we used mainly the 1991-95 period. To calculate significance levels we used the Bonferroni adjustment, which is a method used to address the problem of multiple comparisons.

ic welfare states, continental European states are conservative welfare states, and the Anglo-Saxon countries, as well as Switzerland and Japan, are liberal.[10]

Connecting political ideologies to patterns or regimes in environmental policy requires a distinction illuminating to what extent the Green dimension is expressed in policy outcomes. This requires identifying the principles of a Green ideology and contrasting these with the principles of current industrial societies. I do this in two steps. First, I identify the basic concepts that help us to distinguish between Green and non-Green regime-types. Second, I offer more details about how to operationalize these concepts for the purpose of this study.

Because "Green ideology" is a rather new concept, it is more difficult to identify its legal and organizational features in the interwoven relation between the state and the economy than the classical ideologies of liberalism, conservatism, and socialism. Dryzek et al. (2003) use output variables and see environmentally-related taxes as an indicator for the degree of a Green state. However, in the real world, it is difficult to estimate the goal of taxes. I therefore refrain from using taxes and state spending as indicators of a Green state. In contrast, I use concepts and indicators that are structurally grounded and that reproduce or change the relationship between economy and the state, on the one hand, and the environment, on the other. In order to achieve this goal, I review the literature on Green political theory and try to identify the distinctive features of a Green position in contrast to a non-Green position.

Literature on the ecological development of highly industrialized societies distinguishes between different 'social paradigms' which these societies pursue. "A social paradigm incorporates beliefs about how the world works physically, socially, economically, and politically" (Milbrath 1989; see also Cotgrove 1982). Unfortunately, when it comes to empirical research, it is very difficult to find indicators that identify a Green state or distinguish the "new environmental" from the "dominant" paradigm. In recent years however, there have been some attempts to develop theoretical concepts suitable for collecting data which distinguishes a "Green" from a non-green state (Dryzek et al. 2003; Eckersley 2004; Duit 2009). Naturally, "it hardly need be said that as yet there is no green state in these terms" (Dryzek et al. 2003: 165). Thus, a measure that captures highly industrialized countries' degrees of greenness is a more acceptable approach to estimate if some states are on the way to becoming green(er). For such an analysis, I distinguish Green states that incorporate some elements of the new environmental paradigm, and productionist states that abide by the dominant paradigm.

The term 'productionist' elucidates the character of a state oriented towards the dominant paradigm in which nature is used to produce goods (Milbrath 1989: 120). In other words, production and consumption are the key objectives of states where the dominant paradigm of productionism is hegemonic. However, it would be misleading to place economic growth at the center of the productionist label. We simply cannot say that states with no or little growth are Green states or that Green states

[10] The classification of the United Kingdom, Ireland, and New Zealand is ambiguous in these terms.

do not seek growth. So far no state has developed a strategy in which the idea of economic growth is subordinated to the goal of environmental protection.

Sustainable development is therefore the most far-reaching concept of greenness at the present time, which was introduced by the World Commission on Environment and Development (WCED 1987). The concept of sustainable development attempts to combine both economic growth and environmental protection. In this strategy, some have seen a reorientation, a "new politics of the environment" (Weale 1992). The basic assumption of the concept of sustainable development is that social and economic development "meets the needs of the present without compromising the ability of future generations to meet their own needs." To fill this concept with empirical substance is a controversial matter. One simple indicator of sustainable development is that economic growth is decoupled from environmental pollution. Furthermore, there are some studies that analyze to what extent industrial democracies developed and implemented strategies for sustainable development. In their comprehensive study, Lafferty and Meadowcroft (2000) conclude that the Netherlands, Norway, and Sweden enthusiastically follow sustainable development strategies while the US is disinterested. In their four country comparison, Dryzek et al. (2003) conclude that Germany most closely approximates the status of a "Green state", followed by Norway, Great Britain, and the USA.

In order to assess where states are located on the Green/Productionist dimension, indicators of policy outcomes that capture the essence of this dimension are needed. Andrew Dobson (1995: 88-99; see also: Lindberg 1977; Paehlke 1989; Goodin 1992; Neumayer 2003b; Eder 2009) considers consumption to be a starting point for the analysis of Green states when suggesting that "consumption implies depletion implies production implies waste or pollution" (Dobson 1995: 88). Energy consumption and energy policy are areas in which we can identify the two paradigms most clearly according to these approaches. Lindberg identifies the basic principle of productionism as the "energy syndrome" that guides industrialized societies (see also Lovins 1977 for alternatives). High consumption is unfavorable to a Green state because it degrades the environment. Therefore, most argue that consumption is the basic principle of a productionist state. A Green state would not simply use energy more efficiently in order to allow for increased consumption, but would also seek to decrease the overall level of consumption. "A low-energy strategy means a low-consumption economy; we can do more with less, but we'd be better off doing less with less." (Porritt 1984: 174). Even if measuring the complex relationship between energy use and consumption is beyond the scope of this article, I use energy consumption as the first indicator to distinguish between Green and productionist states. The higher the per capita energy consumption, the more productionist a state.

Aside from consumption rates, the means by which energy is produced is another highly controversial aspect in the debate on modern societies' environmental development. The distinction between nuclear energy and "alternative" energy sources, such as wind and solar, is used as a watershed between the two principles of societal development (Kitschelt 1983; 1984). "Our questions about whether we

should use nuclear power showed some of the largest differences between DSP supporters and NEP supporters"[11] (Milbrath 1989: 126).

Nuclear power stations in particular have come to have a deep symbolic significance: centralized, technologically complex and hazardous, and reinforcing all those trends in society which environmentalists most fear and dislike - the increasing domination of experts, threatening the freedom of the individual, and reinforcing totalitarian tendencies. Opposition to nuclear power is seen for many as a key issue on which to take a stand against the further advance of an alliance between state power and commercial interests. For the objectors, the material advantages from nuclear power cannot justify the risks involved. (Cotgrove and Duff 1980: 338).

As an indicator, I use the proportion of energy obtained from nuclear power, in relation to the proportion obtained from wind/solar energy. When nuclear energy outweighs wind and solar energy, a state is more productionist. If the proportion of wind and solar energy is higher, a state is greener.

Another aspect of how a society is organized according to the two principles of environmental development is transportation (Dobson 1995: 103/4). Private transport is a basic feature of liberal societies. The right to move is essential and private transport in private cars can be considered a basic right in productionist societies. The private car is not only a means of transportation but also a fetish, a symbol of individual identity. Public transport, in contrast, is a basic cornerstone of a Green state. Public transport is seen as environmentally friendly compared to individual car traffic. This suggests that the ratio of private transportation to public transportation can be utilized as a third indicator for the distinction between Green and productionist states. I therefore use the amount of people and goods transported by cars and trucks on the one hand and by trains on the other.[12]

In summation, I utilize three indicators to measure policy outcomes of highly industrialized societies on the Green/Growth dimension (for a detailed operationalization see Jahn and Oberst 2010). A Green state would have: (a) low and decreasing energy consumption; (b) the relation between solar and wind energy, on the one hand, and nuclear energy, on the other, would be in favor of the former; and (c) the relation between private and public traffic would be in favor of public transport. In a productionist society these relationships are reversed.

In order to obtain a valid indicator for energy consumption, I use the energy consumption per GDP unit (dollars) to control for economic conditions. Since energy consumption is furthermore highly dependent on the annual winter temperature, I weight the energy consumption by the Heating Degree Months. The energy consumption index is standardized between 0 and 1. In these terms, in 2005, Australia, the USA, and New Zealand have the highest energy consumption, although – perhaps with the exception of New Zealand – they increased their energy efficiency. Countries with the highest energy efficiency are Switzerland, Denmark, Norway, Ireland, and Austria. From 1980 to 2005 energy efficiency increased most strongly in Ire-

[11] DSP means Dominant Social Paradigm and NEP means New Environmental Paradigm.

[12] There is only data for this rough distinction. There are no comparable data over time for public transport in urban areas.

land, Denmark, the USA, Canada, Great Britain, and Finland, although sometimes from very high levels as in the case of the USA and Canada. Energy consumption increased in Italy, Switzerland, Spain, Greece, Norway, and above all Portugal.

For the energy mix index, I calculated the relationship between alternative or regenerative energy sources and nuclear energy. The former energy sources are wind and solar energy. I standardized the empirical scores over all countries and years for both indicators between 0 and 1, which means that I weigh alternative energy sources around 15 times higher than nuclear energy.[13] The final scale is again standardized between 0 and 1. That means that a country without alternative and nuclear energy scores .5. If nuclear energy dominates over alternative energy sources, the score is below .5 and in the reverse case above .5. Only very few countries follow a Green path in respect to their energy mix. The most apparent is Denmark. Since 2000, Denmark increased its wind energy substantially and because it does not use nuclear energy, the energy mix score is very low. Other countries which use alternative energy to a significant degree without using nuclear energy are Austria, Greece, Ireland, New Zealand, and Portugal. In all these countries, the score is below .5. In Australia, Italy, the Netherlands, and Norway, the score is also below .5 because all of these countries do not use nuclear energy -- although they score only slightly below .5 because they use alternative energy only to a marginal degree. Countries with a substantial share of nuclear energy are France, Sweden, Belgium, Switzerland, Finland, and Canada. The USA and Great Britain also use nuclear energy but their share is moderate. However, what all these countries have in common is that they use very little wind and solar energy. Therefore, their score is well above .5. Finally, there are countries with a high share of nuclear *and* alternative energy. This is true for Germany and Spain, where nuclear and alternative energy are almost equally prevalent in 2005 according to my method of calculation. Japan also uses both nuclear and alternative energy, but here the share of nuclear energy clearly dominates.

Over time, Denmark has increased its use of alternative energy substantially and is clearly leading in this regard. This is especially obvious when considering the fast increase in alternative energy resources, above all wind energy, since the late 1990s. In Spain, Greece, and Portugal, solar energy increased its share in the energy mix. On the other side, Japan, Finland, Sweden, Belgium, and above all France, have seen an increase in the share of nuclear energy in the last 25 years and have not developed alternative energy resources to a significant degree.

The third indicator for a Green or Productionist regime refers to the public/private transport mix. The data refers to the transport of both goods and persons. For the transport of goods, I use the unit tons of freight multiplied by kilometers. For personal transport, I use the number of persons travelling multiplied by kilometer. Both indices were standardized with the empirical scores over all countries and years separately, which results in it that freight transport is weighted 1.09 in relation to the transport of persons. Both indices, transport of freight and persons,

[13] This measure of the index is based on a comparison of the countries included in this study and does not, of course, reflect the real relationship between the use of alternative and nuclear energy. This method of weighting leads to an overemphasis on alternative energy. However, in the framework of this analysis, it is feasible to do so since the use of the raw data would have concealed the role of alternative energy sources. The decision does, however, lead to a bias in favor of a Green state. That means that I may overestimate the degree of "greenness" of highly industrialized states.

contained extreme values, so I used a logarithm for this data. The index is .5 when both public and private transport have equal shares; it is below .5 when public transport dominates and above .5 when private transport dominates. The index of freight transport in territorially-large countries is a special situation since there are huge transport volumes transported by so-called mega trains. Therefore, these countries get a high value for public transport of goods. This is particularly true for Australia, Canada, and the USA. However, goods transported by train in these countries is not primarily motivated by ecological concerns. In contrast to European countries, the railway equipment is normally old and run by heavily-polluting diesel trains. Nevertheless, in Australia, the railway net has expanded in the last decades, which affects the transport of goods on railways. In 2004, almost 3,000 kilometers of the railway track from Adelaide to Darwin were improved to normal size rails, which made it possible to run a new, long-distance train (The Ghan). The share of public transport for persons is radically different in Canada and the USA. Since the traffic in goods is traditionally high and over long distances, and since the use of railways is not so much directed by ecological concerns than by pragmatic concerns, I weight transport of persons double that of the transportation of goods.

In total, Austria, Germany, Australia, Sweden, and above all Switzerland have a "Green" transport mix, where public transport is strong in comparison to private transport. Private transport dominates unchallenged in the United States, Ireland, and above all Greece and New Zealand.

Finally, I summed up the three indicators of energy consumption, energy mix and public/private transport to an index of Environmental Regimes. This index is composed in a similar way as the EPI. That means that I weighted the changes double as much as the level. The index has then been standardized between 0 and 1. Table 3 shows the results for 1996-2005:

Table 3: Environmental Regimes in 21 OECD Countries (1996-2005)

Country	*Environmental Regime Index (0 = Productionist; 1 = Green)*	*Energy Consumption (0 = low; 1 = high)*	*Energy Mix (0 = dominance of alternative energy; 1 = dominance of nuclear power)*	*Transport Mix (0 = dominace of public transport; 1 = dominance of private transport)*
Denmark	1.00	0.13	0.19	0.38
Austria	0.57	0.17	0.45	0.23
Germany	0.57	0.31	0.59	0.21
Switzerland	0.54	0.12	0.79	0.06
Norway	0.45	0.00	0.50	0.35
Spain	0.44	0.61	0.56	0.38
Finland	0.42	0.31	0.70	0.24
Sweden	0.39	0.33	0.91	0.14
United Kingdom	0.38	0.38	0.61	0.45
Canada	0.37	0.63	0.60	0.36
Netherlands	0.35	0.43	0.49	0.43
Italy	0.34	0.34	0.49	0.36
Ireland	0.33	0.18	0.47	0.66
Australia	0.31	1.00	0.49	0.18
Portugal	0.31	0.60	0.47	0.41
Japan	0.21	0.55	0.65	0.34
Belgium	0.18	0.62	0.75	0.33
United States	0.13	0.81	0.59	0.54
France	0.07	0.53	0.99	0.30
Greece	0.06	0.59	0.41	0.97
New Zealand	0.00	0.86	0.49	0.89

Countries that diverted from the productionist path to some degree are Germany, Switzerland, Austria, and above all Denmark. In these countries, structural developments accord with Green ideology. The most productionist countries are Japan, Belgium, the US, France, Greece, and above all New Zealand.

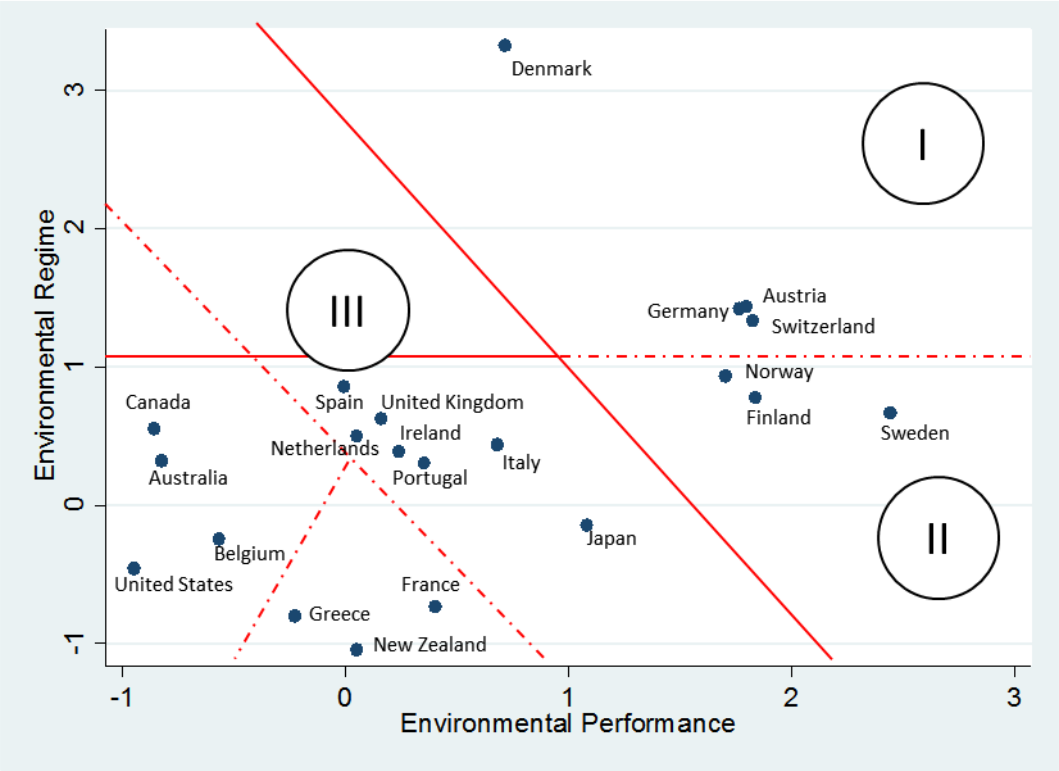
4 The Three Worlds of Environmentalism

In the last part of this article, I combine the two aspects of environmental development to answer two questions: To what extent is environmental performance connected to environmental regimes? And, are there distinct patterns of development? The indices in the analysis incorporate both level and changes and use an average of ten years. I use such a long time frame since structural changes occur only over long periods of time. The bivariate correlation between both variables is .37 over the whole period of analysis. However, since environmental policy is a new field and the cleavage structures are not as strongly institutionalized as in the Left/Right dimension, it is not as clear as in social policy whether structure determines policy or rather whether policy decisions still shape structure. In order to shed some light on this question, I conducted regression analyses with different time

lags, trying both environmental policy performance as the dependent variable, as well as environmental regimes. The strongest correlation is after one year when we take environmental performance as the dependent and environmental regime as the independent variable. This suggests that socio-structural factors have a significant impact on environmental performance.[14]

In order to identify patterns, I cross-tabulated the two variables and conducted a cluster analysis.[15] I divided the scatter plot into sections which correspond to the identified clusters of the cluster analysis. The results are shown in figure 2:

Figure 2: The Three Worlds of Environmentalism (1996-2005)



The scatter plot shows that there are three worlds of environmentalism. This interpretation is also confirmed by the cluster analysis which identifies two main clusters: the countries with a high environmental performance, on the one hand, and the countries with a less successful environmental performance on the other. Within these two clusters are sub-clusters. The environmentally successful countries of Austria, Germany, and Switzerland constitute the most homogeneous cluster in the whole analysis. Norway, Finland, and Sweden are clearly divided from this homogeneous group of countries. Denmark, because of its very isolated position, constitutes

[14] They explain in fact 13 percent of the variance. Actually, environmental performance impacts on environmental regimes as well. However, here the time lag is five years and the explaining power is eleven percent. This shows that structure is reshaped by policy decisions in the medium-long term.

[15] I applied a cluster analysis with both variables: environmental performance and environmental regimes for the period 1996-2005. I used the within-groups linkage method. Here, the dissimilarity between cluster A and cluster B is represented by the average of all the possible distances between the cases within a single new cluster determined by combining cluster A and cluster B. Furthermore, I used the Chebyshev distance which is the maximum absolute difference between a pair of cases on any one of the two or more dimensions which are being used to define distance. The Chebyshev distance is an effective method for hierarchical clustering with single linkage criterion.

its own cluster. This constellation can be interpreted to suggest that Austria, Germany, Switzerland, and Denmark constitute the first world of environmental policy which combine a high score in environmental performance and environmental regime. Norway, Finland, and Sweden, in contrast, form a group of countries with a high environmental performance but which follow a productionist policy regime. The country with the most successful environmental performance in the last decade is Sweden. However, this success did not translate into (or was motivated by) a decoupling from productionist development. Denmark, in contrast, initiated many steps in the direction of a Green state. However, its environmental performance is just slightly above average.

The environmentally less successful states can also be divided into several groups. Here the clearest dividing lines are between, first, Canada, Australia, Belgium, and the United States, second, Greece, New Zealand, and France, and third, the rest of the countries such as the Netherlands and the United Kingdom. The first group of countries has the lowest environmental performance and adhere firmly to productionist development. All of these countries, except Belgium, have a large territory and belong to the "New Anglo-Saxon World" countries. The second group constitutes the most productionist countries. New Zealand is the most productionist country in the sample. Greece and France are also extreme productionist countries. All the countries in this cluster, perhaps with the exception of France, also show a rather low environmental performance. In fact, these two sub-clusters can be merged since all the countries in these clusters combine a rather strong attachment to productionism with below average environmental performance. The last group combines countries with a moderate environmental performance (only Japan and Italy perform above average in this group) and a clear attachment to productionism. Japan falls a little bit out of this cluster which may imply that Japan might have some features with the countries in cluster II.

6 Conclusion

This analysis demonstrates that there are roughly three worlds of environmentalism among the highly industrialized democratic countries. Most countries still follow a productionist developmental trajectory. However, environmentally successful performance can take two different avenues: on the one hand, countries detaching from a productionist paradigm to a certain degree and, on the other hand, they may adhere to productionism. Countries without success in environmental performance are all productionist.

These groupings do not correspond as well as welfare states into geographical categories or into families of nations. However, some patterns are obvious. Countries with a Green and successful environmental performance style are the three "German speaking countries" of Austria, Switzerland, and Germany. The Nordic countries belong – with the clear exception of Denmark – into the group of environmentally successful states following the spirit of productionism. There are some indications that Japan also falls into this category. This dividing line between Green and Productionist development has also been identified in studies comparing the

ecological discourses of political actors and the mass media in Sweden and Germany (Jahn 1993; 2000).

The less environmentally successful countries with productionist development fall in several groups: first, there is the group of countries with a large territory and low population density (Australia, New Zealand, Canada, and the USA). All these countries belong to the non-European Anglo-Saxon family of nations. The European Anglo-Saxon countries, the United Kingdom and Ireland, fall together with most of the Mediterranean countries (Italy, Spain, Portugal) and the Netherlands into a group of productionist countries with slightly below average environmental performance. In this group, the great surprise is the Netherlands. In the past, the Netherlands was often a leading nation in both environmental performance and the development of a Green state. However, in the last decade, the Netherlands lost this position and now finds itself among other less successful productionist countries. This conclusion results from the fact that development in both dimensions fails to meet the criteria for environmental success and a Green state.

The analysis in this article shows that there is a similar divide of countries in the field of environmental policy as there is in welfare state research. The major conclusion is: ideology matters in policy research. As the Left has been able to establish a comprehensive welfare state, Green ideology goes together with a less productionist development. However, because no country combines a Green environmental regime with poor environmental performance, Green ideology is the most effective element in enhancing environmental performance. However, good environmental performance can also emerge within the productionist logic of societal development. The contrast surfaces between large scale technology such as nuclear energy or high energy consumption, on the one hand, and small scale technology such as solar or wind energy, on the other. This divide has been identified in political theory twenty or thirty years ago. It has become a guiding principle in the field of environmental policy in the 21st century.

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