ECOLOGICAL MODERNIZATION: A VIABLE OPTION FOR A SUSTAINABLE FUTURE?

Zeynep Sezgin*

Abstract

The environment has been at the head of the world political agenda since the 1960s. Environmental problems that piled up from the Industrial Revolution onwards such as pollution and resource depletion became crucial after the Second World War (WWII) due to excessive industrialization, technological developments and the prevalent growth paradigm. These problems were initially dealt with an understanding that presumed a deep conflict and a zero-sum game between environmental protection and economic development. Hence, the initial efforts to deal with environmental problems reflected an endeavor to balance these two goals. Soon however, the centrality of economic growth reasserted its position and a way had to be found to achieve economic growth while respecting environmental concerns. Sustainable development, introduced in 1987 by the World Commission on Environment and Development (WCED) was the product of this process and hence the new way of perceiving the relationship between environment and development. Ever since then it has become the main recipe for the international community, national governments and environmental groups for achieving environmental goals. Sustainable development is a vague concept and has ample interpretations. Among these competing interpretations, ecological modernization has established its hegemony. The main aim of this article is to present a thorough analysis of the theory and policy strategy of ecological modernization in order to validate the above claim and to understand the current developments in the global, regional and national politics of the environment.

Keywords: *Ecological modernization, sustainable development, weak sustainable development*

* Dr., Doğuş University, School of Advanced Vocational Studies, Foreign Trade Program, e-mail: zsezgin@dogus.edu.tr

EKOLOJİK MODERNLEŞME: SÜRDÜRÜLEBİLİR BİR GELECEK İÇİN GEÇERLİ BİR SEÇENEK Mİ?

Özet

Çevre politikası 1960'lardan itibaren dünya siyasi gündeminin en önemli unsurlarından birisi olmuştur. Sanayi devriminden itibaren kirlilik ve kaynakların tükenmesi gibi artarak biriken çevre sorunları, 2. Dünya Savaşı sonrasında yaşanan aşırı sanayileşme, teknolojik gelişmeler ve var olan büyüme paradigması sonucunda daha da hissedilir hale gelmiştir. Tüm bu sorunlar ilk etapta çevre koruması ve ekonomik gelişme arasında derin bir çelişki ve sıfır toplamlı bir oyun ilişkisi öngören bir anlayış ile ele alınmıştır. Dolayısıyla, çevre sorunları ile baş etmek amacıyla gerçekleştirilen ilk çabalar da söz konusu iki hedefi dengeleme amacı gütmüştür. Ancak kısa süre içerisinde ekonomik büyümenin vazgeçilemeyecek bir hedef olduğunun anlaşılması sonucu, çevre sorunlarına duyarlı bir ekonomik büyüme modelinin hayata geçirilmesi gerekliliği baş göstermiştir. 1987 senesinde Dünya Çevre ve Kalkınma Komisyonu tarafından öne sürülen sürdürülebilir kalkınma yaklaşımı işte bu ihtiyacın ürünü olarak ortaya çıkmış ve çevre-kalkınma ilişkisini algılamada yeni bir yöntem ortaya koymuştur. Sürdürülebilir kalkınma kısa sürede çevre sorunlarını ele alan uluslararası toplum, hükümetler ve çevresel gruplar için ana yol haritası haline gelmiştir. Sürdürülebilir kalkınma muğlak bir kavramdır ve bu bağlamda da pek çok yorumu bulunmaktadır. Tüm bu birbirleriyle yarışan yorumlar arasında ekolojik modernleşme egemen yorum haline gelmiştir. Bu çalışmanın temel amacı yukarıdaki iddiayı desteklemek ve küresel, bölgesel ve ulusal çevre politikasındaki güncel gelişmeleri anlayabilmek açısından ekolojik modernleşmeyi bir teori ve politika stratejisi olarak derinlemesine ele almaktır.

***Anahtar Sözcükler**: Ekolojik modernleşme, sürdürülebilir kalkınma, zayıf sürdürülebilir kalkınma*

Introduction

The relationship between environment and development has been a central concern of all environmental policy efforts from the 1960s onwards. The 1960s and more profoundly the 1970s were characterized by a belief in the incompatibility between environmental protection and economic development. The catastrophic scenarios of this period depicted environmental degradation as an issue of survival and hence foresaw either zero-growth strategies or de-modernization as a way to reverse the environmental downfall. With the advent of the 1980s, however, the perception as regards the incompatibility between the abovementioned goals gave way to more optimistic views about their compatibility.

This ideational transformation reached its peak with the introduction of the concept of 'sustainable development' to world environmental literature with the

publication of the report, *Our Common Future* (also known as the Brundtland Report) by WCED in 1987. During the same period, the theory of ecological modernization was also being developed, initially by German social scientists, in an aim to provide a theoretical background to the environmental policy developments in the environmental forerunner countries in Europe in the course of the 1970s. What these social scientists argued was that the institutional set-up of modern industrial societies could be adjusted to accommodate the environmental crisis through more modernization and macroeconomic restructuring. In that sense, both sustainable development and ecological modernization rejected the basic presumption of the earlier decades that either environmental protection or economic growth are attainable goals and opted instead for a 'sustainability discourse' that ruled out all the de-modernization and zero-growth strategies with a genuine belief in the idea that "we can have them all" (Dryzek, 1997: 121).

I. Sustainable Development and Ecological Modernization – A Comparison

Sustainable development and ecological modernization share a crucial common characteristic: the denial of a zero-sum game between environment and development and the adoption of a win-win strategy. Besides this, both approaches argue for environmental policy integration (EPI) and the extended use of new environmental policy instruments (NEPIs) such as market-based instruments and voluntary agreements (instead of command-and-control type of instruments) for more efficiency in environmental policy implementation. They also share a common belief in the possibilities that potential technological improvements have in rendering an environmentally-friendly future.

These common features have led to an association between sustainable development and ecological modernization as if they were 'synonyms' (Baker, 2007: 300). The fact that sustainable development has many competing interpretations and the feasibility of an ecological modernization policy strategy for the implementation of sustainable development compounded this association. It is not easy to draw certain boundaries between these two concepts. Both concepts are contested and lack a single framework. As for sustainable development, there are various interpretations implying different policy outcomes. As for ecological modernization, it should be noted that it is both a theory of social change and a policy strategy for the environment. As a theory, it tries to explain and guide the ecological and economic transformation of modern industrial societies. However, it has become more pronounced and adopted where it has been used as a policy strategy. An ecological modernization policy strategy has appealed to the international community and national governments from the 1990s onwards due to its optimism for reversing environmental degradation without overhauling the

whole set-up of modern industrial societies. Due to this appeal, it has become the dominant interpretation of sustainable development which has become the main frame of reference for environmental policy since its formulation. However, sustainable development and ecological modernization do not denote the same thing, though they are intertwined. Accordingly, the differences between sustainable development and ecological modernization (theory) should not be overlooked while acknowledging their similarities.

Sustainable development and ecological modernization have crucial differences. To start with, sustainable development is a much broader concept than ecological modernization (Schreurs, 2011). It is based on a three-pillar system, placing economy, ecology and society on an equal footing. It recognizes the different levels of economic development throughout the world and appreciates the developing countries' right to development. It has also put forward normative notions such as 'intergenerational equity' and 'intragenerational equity' as well as the acknowledgement of the principle of 'common but differentiated responsibilities'. Therefore, "sustainable development is not only about the environment" (Langhelle, 2000: 308). Furthermore, the notion of 'limits' is acknowledged in sustainable development based on the earth's carrying capacity. In addition, the role assigned to social and environmental groups in precipitating environmental improvements is crucial to sustainable development.

Ecological modernization should be approached from two different perspectives. First, it is a theory of social change that aims to illuminate the transformation of modern industrial society into an ecologically-aware one, that has the capability to accommodate the environmental crisis with the necessary institutional and macroeconomic adjustments. Second, ecological modernization is also a policy strategy. It has a definitive set of policy prescriptions which are fundamentally market-based, flexible in character and which assumes the voluntary participation of the business as they would see profits to be made in environmental protection. Technological improvements for resource efficiency lie at the heart of ecological modernization theory and policy strategy.

As such, ecological modernization concerns itself more with the transformation of the economic system along ecological concerns delegating the main role to science, technology and private actors. It is basically an approach developed based on the experiences of Western developed countries, even though it increased its geographical breadth in the course of its development. Ecological modernization not only stresses the win-win relationship between environmental protection and economic growth, but it also argues for more environmental protection for further economic development. It does not concern itself so much with development issues. Furthermore, ecological modernization lacks a crucial element that sustainable development incorporates; a decrease in economic growth (Baker and Eckerberg, 2008: 6-7).

In addition, participation by social groups and equity are not as emphasized as they are in sustainable development. Main references in this sense are given to the voluntary participation of the business and private actors in environmental policy implementation based on economic motivations. There are no references to the normative notions such as intergenerational and intragenerational equity as in sustainable development (Langhelle, 2000: 309). Overall, it seems that while sustainable development is a strategy to reconcile the interests of developed and developing countries in terms of environmental policy, ecological modernization is mostly an approach that originated in and is mainly explanatory for the case of developed countries (Toke and Strachan, 2006: 156).

From this above overview, one can safely conclude that these two approaches are intertwined and have a lot in common as well as their differences. It is necessary to emphasize that ecological modernization policy strategy is what has the most in common with sustainable development. As a result of the politically feasible choices brought about by the world global economic and political predicament, ecological modernization policy strategy has become the dominant interpretation of sustainable development, if not its synonym. This does not imply the assimilation of either sustainable development into ecological modernization nor vice versa. Ecological modernization theory is an approach on its own which has later been developed also within the genre of environmental sociology. Ecological modernization also has its 'weak' and 'strong' forms (Christoff, 1996). Nevertheless, such an analysis goes beyond the scope and limits of this article. However, as this article aims to present, ecological modernization policy strategy has become the mirror-image of sustainable development policy. Based on this argument, the following sections of the article will present a brief overview of sustainable development and its different interpretations and later analyze the theory and policy strategy of ecological modernization in an aim to capture the interconnected nature of these two approaches. It will focus on the example of EU environmental policy in order to demonstrate the dominance of ecological modernization policy strategy in the efforts to achieve sustainable development by major environmental policy actors. Finally, the article will present criticisms against ecological modernization and conclude with a discussion as to whether ecological modernization is a viable option for a sustainable future.

II. Sustainable Development

Sustainable development is a term used first in the *World Conservation Strategy* (IUCN, 1980) published by the International Union for Conservation of Nature and Natural Resources. However, it gained its current meaning with the publication of *Our Common Future* by WCED in 1987. The official definition for sustainable

development is the "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987: 43). It was devised as a cure to the problems of the environmental policies of the previous decades, which Weale (1992) calls the "old" politics of pollution, to meet the criticisms directed against the development paradigm that was prevalent from the end of WWII onwards, and to respond to the new environmental problems that emerged in the course of the 1980s such as ozone depletion and nuclear accidents.

Two important concepts are attached to the official sustainable development definition: 'needs' and 'limits'. The emphasis on needs mainly refers to the necessity to meet the basic needs of the poor and to eliminate poverty. This links sustainable development with the notion of 'intragenerational equity'. The emphasis on limits, on the other hand, refers to the limits posed by the present level of technological development and earth's carrying capacity on the fulfillment of such basic needs. This links sustainable development with the notion of 'intergenerational equity'.

Sustainable development formula also comprises other normative foundations. 'Common but differentiated responsibilities' is a principle that recognizes the huge disparity between developed and developing countries in their contribution to environmental degradation as well as their "capacities" to prevent the environment from further deteriorating (Baker, 2006: 36). This principle also implies that developed countries would commit more of their resources and give up more on their development agendas than the developing countries in an aim to decrease and reverse environmental degradation. Finally, *Our Common Future* also made it explicitly clear that sustainable development could only be achieved through a new mode of governance which is more participatory. The central actors to take part in this process were defined as international and sub-national levels of governance, non-governmental organizations, scientific community, the public and the industry.

The overarching sustainable development formula and its political feasibility and attractiveness led to the adoption of the concept as a "dominant global discourse of ecological concern" (Dryzek, 1997: 123). Much of this owes to the vague nature of the 'sustainable development' definition. This, in turn, has led to the emergence of different and sometimes contradictory interpretations of the concept. The next section will dwell upon these interpretations and their policy implications.

III. Different Interpretations of Sustainable Development

Sustainable development has a vague and imprecise definition. This is the reason why ample definitions have been provided for the concept apart from the original definition provided by WCED (Lélé, 1991). Some scholars call it "a conceptual framework" (Strange and Bailey, 2008: 30) and some call it "a

discourse" (Dryzek, 1997: 123). This "lack of clarity" is argued by some scholars to have rendered sustainable development "politically advantageous, because it has allowed groups with different and often conflicting interests to reach some common ground upon which concrete policies can be developed" (Baker, 2006: 27). Therefore, it can be argued that sustainable development would not have provided such a platform for the coordination of environmental and economic objectives if it had been defined too strictly. Therefore, different groups in the field of environmental policy-making attach themselves to the concept of sustainable development from a different perspective. Some highlight strong components such as equity and ecology, whereas some place more emphasis on the economic implications of the concept and hence adopt a weaker interpretation. These differences also result in different policy prescriptions. The ladder of sustainable development below highlights these different interpretations.[1]

The table below presents four different interpretations of sustainable development. On the bottom of the ladder, the 'pollution control approach' exemplifies the stance that foresees no serious changes to reverse environmental degradation. This is also referred to as the "business as usual" approach (Söderbaum, 2008: 14). This approach is based on a genuine belief in science, technology and the human capacity to deal with any kind of environmental problems. In addition, the Environmental Kuznets Curve (EKC) hypothesis lies at the heart of this approach. The EKC hypothesis states that the high levels of environmental problems in the beginning stages of industrialization would be remedied in the later stages due to a transformation of the economic system "into a less resource-intensive, post-industrial stage" (Baker, 2006: 32). This hypothesis is generally criticized for not being proven by empirical data as well as its econometric weaknesses, and its ignorance of the displacement of pollutants (Stern, 2004; Cole 2007; Baker, 2006). Nevertheless, the part of the hypothesis that sees a positive correlation between economic growth and environmental improvements is what links it to the concept of sustainable development (Stern, 2004: 1419).

[1] Some parts of the ladder are not included in order to stay within the limits of this article and some cells are only a section of their original form.

Table 1: The Ladder of Sustainable Development – the global focus

Model of SD	Normative Principles	Type of Development	Governance	Technology	Policy Integration	Policy Tools	Civil society – state relationship
Ideal Model	Principles take precedence over pragmatic considerations	Right livelihood; meeting needs not wants; biophysical limits guide development	Decentralization of political, legal, social and economic institutions	Labour-intensive appropriate, Green technology; new approach to valuing work	Environmental policy integration; principled priority to environment	Internalization of SD norms through on-going socialization, reducing need for tools	Bottom-up community structures and control; equitable participation
Strong SD	Principles enter into international law and into governance arrangements	Changes in patterns and levels of consumption; shift from growth to non-material aspects of development; necessary development in Third World	Partnership and shared responsibility across multi-levels of governance (international; national, regional and local); use of good governance principles	Ecological modernization of production; mixed labour- and capital-intensive technology	Integration of environmental considerations at sector level; Green planning and design	SD indicators; wide range of policy tools, Green accounting	Democratic participation; open dialogue to envisage alternative futures
Weak SD	Declaratory commitment to principles stronger than practice	Decoupling; reuse, recycling and repair of consumer goods; product life-cycle management	Some institutional reform and innovation; move to global regulation	End-of-pipe technical solutions; mixed labour- and capital-intensive technology	Addressing pollution at source; some policy coordination across sectors	Environmental indicators; market-led policy tools and voluntary agreements	Top-down initiatives; limited state-civil society dialogue; elite participation
Pollution Control	Pragmatic, not principled, approach	Exponential, market-led growth	Command-and-control state-led regulation of pollution	Capital-intensive technology, progressive automation	End-of-pipe approach to pollution management	Conventional accounting	Dialogue between the state and economic interests

Source: Baker (2006: 30-31) (SD: sustainable development)

The 'ideal model of sustainable development' lies at the opposite extreme. According to this approach, "structural change" is necessary for environmental improvement (Baker, 2006: 34). Some strands of this approach are even critical of the concept of sustainable development in the first place. The Deep Ecology movement known by its proponent Arne Naess for instance argues for "no more interference than is necessary in order to satisfy *vital* human needs" and hence proposes "full ecological sustainability" (Naess, 1997: 61-62). Suffice to say that this interpretation has an inclination to carry sustainable development to its limits ecologically and bring about major changes in the economic and social system that would allow for a fully ecological society.

These two extreme positions set aside, more realistic and empirically exemplified interpretations are the 'weak' and 'strong' interpretations of sustainable development. 'Weak' sustainable development has the target of achieving "capitalist growth with environmental concerns" (Baker, 2006: 32). Economic development is taken to be the basis of environmental protection. Here, sustainability as a concept is generally taken to be the non-depletion of capital. This means that this approach takes any economic activity to be environmentally sustainable if any form of capital can replace natural capital. Thus, if human-made capital can replace natural capital, this approach sees no contradictions in terms of sustainability. The tool to calculate the levels of human capital created and natural capital diminished is cost-benefit analysis (CBA). After the CBA has been conducted, if greater value is created than the value that people are willing to pay to preserve the environment, then it is rational to conduct the economic activity. Hence, the basic premise in 'weak' sustainable development becomes "putting a price on the planet" (Dresner, 2008: 116). This approach is criticized as some forms of environmental degradation cannot be valued. However, it forms much of the basis of the global politics of the environment and feeds the policies of most of the international organizations that have environmental tasks such as the World Bank (WB) (Baker, 2006: 33). In addition, the policy tools associated with this approach are increasingly promoted as efficient environmental policy instruments and hence prescribed particularly from the 1990s onwards by the actors of global environmental governance, regional blocs such as the European Union (EU) and national governments.

In 'strong' sustainable development, "environmental protection is a precondition of economic development" (Baker *et al*, 1997: 15). Different from the 'weak' approach, the notion of substitutability between natural and human capital is perceived in another way. 'Strong sustainable development' approach assumes some sort of substitutability between different types of capital, but limits this with the notion of "'critical' natural capital" that has to be kept intact (Baker, 2006: 33). This in turn implies that some economic activities should be limited even though positive CBA results are obtained.

An analysis of the development of international, regional and national environmental policy from the late 1980s onwards reveals the presence of a mixture of these two interpretations of sustainable development, 'weak' and 'strong'. Strong sustainability elements in Baker's typology such as changes in consumption patterns, EPI and ecological modernization of production establish links between 'strong' sustainable development and ecological modernization. The emphasis on decoupling and NEPIs in 'weak' sustainable development is also attributable to

ecological modernization. In that sense, Baker (2006: 140) argues that "ecological modernization would appear to straddle the weak and strong versions of sustainable development".

Ecological modernization appealed to governments, international organizations and the private sector as a policy strategy that saw environmental problems as mainly efficiency issues that could be solved with the appropriate tools. Organization for Economic Cooperation and Development (OECD) was particularly influential in the popularization of such an idea. With the introduction of the polluter-pays principle in the early 1980s, the continual emphasis on the compatibility and interrelatedness of environmental protection and economic growth and the role of technology in this reinforcing relationship, OECD functioned as a platform to popularize ecological modernization discourse and policy strategy among its members. The introduction of sustainable development soon after such OECD involvement in environmental issues led sustainable development and ecological modernization policy strategy to develop as twin-sisters from their introduction onwards. Therefore, it became possible to side both with sustainable development and ecological modernization, even if their differences rendered them contradictory from time to time. Indeed, ecological modernization became the dominant way of understanding sustainable development and pursuing policies that are associated with it.

IV. The Road to Ecological Modernization

Ecological modernization is a theory developed by European social scientists to explain the changing relationship between environment, economy and society from the 1980s onwards. It particularly concentrated on the experiences of Germany and the Netherlands, known to be countries that served as the best examples to the implementation of ecological modernization policy strategy. This fact has led to criticisms against ecological modernization theory in terms of its Eurocentricity. The development of ecological modernization theory in the 1980s is therefore, the result of both the rising environmental concern in the global sense from the 1970s onwards, as well as the environmental policy developments in the progressive European countries such as Germany and the Netherlands.

Ecological modernization theory was first put forward by German social scientists. Their main focus was the environmental policy developments in Germany that necessitated the introduction of a new way to perceive and shape reality. Among these prominent ecological modernization theorists are Joseph Huber, Martin Jänicke, Udo Ernst Simonis, Klaus Zimmermann and Volker von Prittwitz. Following them, Dutch and English social scientists such as Arthur Mol and Gert Spaargaren, Maarten Hajer, Albert Weale and Joseph Murphy have also contributed substantially to the development of the theory. Dutch contributions mainly originated from the discipline of sociology and placed ecological modernization theory within the genre of environmental sociology.

Albert Weale and Maarten Hajer have focused foremost on institutional and discursive aspects. David Sonnenfeld from the USA should also be mentioned among the prominent scholars of ecological modernization. During the 1990s and particularly from the 2000s onwards, the theory expanded its geographical scope and attempted to explain the environmental policy transformations taking place globally. Hence, it entered into a path where the criticisms as regards its Eurocentricity were partly met.

What led to the introduction of the theory and discourse of ecological modernization in the 1980s? Hajer (1995: 96) argues that the discursive turn in the environmental debate can be related to "three different tracks". The first is the publication of the WCS that not only introduced 'sustainability' to the environmental debate but also concentrated on policy-making in a joint manner by IUCN and various programmes of the United Nations (UN) and World Wildlife Fund. The second track is the involvement of OECD in the environmental debate. By defining environmental problems as mainly efficiency issues to be cured by efficient environmental policy tools and by introducing the 'polluter pays principle', the OECD functioned as an important vehicle in disseminating ideas associated with ecological modernization to its member governments. Finally, the third track is the involvement of the UN in the environmental debate that resulted in the formulation of 'sustainable development' as a roadmap for future environmental endeavors.

Apart from being a theory of modern industrial societies, ecological modernization is also used as a policy strategy. Some scholars of ecological modernization perceive it as a broad framework for analyzing structural change in modern societies whereas others perceive it in the narrow sense, referring to specific policy developments. Some scholars even argue that the most successful domain for ecological modernization is where it is used as a tool to analyze the policy developments in selected cases. This owes mainly to the criticisms the theory has received as a theory of social change. As such, ecological modernization should be approached from at least two angles: a theory of social change and a policy strategy for the environment, which means that it is both "descriptive", and "prescriptive" (Murphy and Gouldson, 2000: 33).

V. Ecological Modernization as a Theory of Social Change

The main premise of ecological modernization is that environmental protection and economic development are reinforcing processes. This is, however, not the whole story. There are other crucial points that need to be explored. It should be noted that "there is no one canonical statement of the ideology of ecological

modernisation" (Weale, 1992: 75). Ecological modernization is a response to the environmental deterioration that was jeopardizing the institutional set-up of modern society. Here is where it becomes a theory of social change that aims to reverse environmental deterioration while at the same time re-instituting some of the basic elements of modern society. As such, ecological modernization theory rests upon "the emergence of an ecological sphere, introducing and institutionalizing an ecological rationality" (Leroy and Tatenhove, 2000: 194).

The ecological sphere argument is where the innovative role is played by ecological modernization theory. Unlike the earlier de-modernization approaches that argued for zero-growth strategies, "ecological modernization theory starts from the proposition that the environmental crisis can and should be overcome by a further modernization of the existing institutions of modern society" (Spaargaren, 2000: 56). This is what links ecological modernization with 'reflexive modernization'. Reflexive modernization also argues for a "progressive modernization of societies" in order to reverse environmental degradation (Buttel, 2000: 29). Hence ecological modernization is more constructive than the approaches in the previous decades that are characterized by doomsday scenarios.

This inclination towards more modernity is visible from the first works provided on the theory after its arrival. Huber (1982) is among the prominent ecological modernization scholars that argued for "super-industrialization" as a way to solve environmental problems. Since then, the emphasis of ecological modernization on the importance of science and environmental technology has been a recurrent theme. What was missing in Huber's account was later taken up by Jänicke (1985) and Simonis (1989) where there was a greater appreciation of the role of the state in environmental reform. This brought ecological modernization theory to embrace two crucial and interrelated aspects. The need to move away from curative to preventive environmental policy and the need to move away from command-and-control type of environmental instruments towards more flexible tools. Thus, what needed to be abandoned was identified to be "top-down" and "end-of-pipe" measures giving way to the effort "to internalize the solution of environmental problems into the polluting sectors" (Jänicke, 2006: 1). This could only have been achieved by a change in environmental policy, and an active policy on behalf of the state. The importance of the role the state can play in achieving "a conversion of the economy" is also acknowledged by Simonis (1989). This brought ecological modernization theory from its emphasis on "industrial innovation" towards "macro-economic restructuring" (Murphy and Gouldson, 2000: 34).

Following these early contributions, other influential works focusing on ecological modernization were introduced throughout the 1990s (Weale, 1992; Hajer, 1995). Weale (1992) presented how different institutional contexts lead to different consequences in terms of the implementation of ecological modernization comparing British and German policies towards acid rain. Jänicke (1992: 53) has also concentrated on the institutional factors that provide more advantageous

grounds for the success of ecological modernization with his "capacity for modernization" analysis which refers to "the achieved level of institutional, material and technical ability in a country to find solutions to problems". Arguably the most ground-breaking work in the ecological modernization theory during this period was presented by Hajer (1995). Hajer (1995: 4) focused on the discursive components of ecological modernization, stressed the need to illuminate how environmental problems are defined, and analyzed ecological modernization "as the new dominant way of conceptualizing environmental problems". Dryzek (1997) has also approached ecological modernization from a discourse analysis perspective and identified the main discursive components of the theory. Therefore, the works produced during the 1990s not only identified the basic parameters of ecological modernization theory, but also attempted to identify the favorable conditions for the theory to be a device for future action.

Building from this, the contributions in the 2000s and beyond extended the scope of ecological modernization "theoretically and geographically" (Mol and Sonnenfeld, 2000: 5), focusing on the role of consumption for ecological modernization (Spaargaren, 2000; Spaargaren and Vliet, 2000), ecological modernization beyond Western Europe (Lithuania – Rinkevicius, 2000; Brazil – Milanez and Bührs, 2008; the United States – Schlosberg and Rinfret, 2008) and ecological modernization and global dynamics (Mol, 2002). When all the genealogy of the theory of ecological modernization is analyzed, some recurring themes and key characteristics present themselves. Even though the theory has acquired changing focuses through time, there are some fundamental notions associated with ecological modernization. Gouldson and Murphy (1996: 14) identify four core themes in ecological modernization:

- Environment and economy can be successfully combined for further economic development with the aid of government intervention;
- Environmental policy goals should be integrated into other policy areas;
- Alternative and innovative policy measures should be explored; and
- The invention, innovation and diffusion of new clean technologies is essential (Gouldson and Murphy, 1996: 14).

The first and foremost common theme in all of the ecological modernization literature is the win-win relationship between economic growth and environmental protection. Furthermore, this win-win relationship is also backed up by the argument that environmental protection is actually a prerequisite for further economic growth. These two propositions stem from a genuine belief in

'decoupling', implying the possibility that economic growth can be achieved without environmental damage; the creation of a 'double dividend', implying the achievement of environmental protection and employment at the same time; and the efficiency gains to be achieved by technological improvements. In that sense, the ecological modernization discourse focuses on the positive economic and social benefits to be created via environmental protection.

The second common theme, the need to move away from curative and top-down approaches towards preventive and flexible approaches and the emphasis on the role of the state in precipitating this change has resulted in the adoption of the principle of EPI. EPI implies the integration of environmental concerns into all types of public policies in order to avoid the sectoral and piecemeal approach towards environmental policy in favor of a more holistic approach. In that sense, what need to be achieved are both an 'ecologisation of economy' and an 'economisation of ecology' (Huber, 1982: 12).

The former implies the replacement of old environmental technologies which are end-of-pipe in character with cleaner and greener technologies. This builds the relationship between ecological modernization and the importance attached to science and the development of environmental technologies and innovation. Therefore, a new genre of technology is prescribed for solving environmental problems. This is also argued to solve the problem of displacement of polluting industries across boundaries. This point also links ecological modernization with the precautionary principle, which argues for preventive action where long-run risks are not foreseeable.

The latter target is related to the need to bring the market more into the play of environmental policy, via pricing the environment as a factor of production. This brings about certain related necessities. First, in order to achieve the above target, efficient and flexible instruments have to be devised that would allow for the internalization of the environmental damage created. NEPIs such as market-based instruments, eco-management systems, eco-labeling and voluntary agreements are prescribed as more efficient environmental policy tools than command-and-control type of instruments since they motivate the polluters to comply with environmental criteria and to invest in environmental technologies. As such, NEPIs are also argued to precipitate the voluntary involvement of business in environmental policy once the role of market mechanisms in environmental policy is enhanced. Second and in relation to the former, this would allow for more participatory forms of governance as new actors (business, consumers, interested parties, etc.) would get themselves more and more involved with the process of environmental policy-making.

The key characteristics of ecological modernization can be observed in global and regional politics of the environment from the 1990s onwards. A historical perspective on the development of global and EU environmental policy demonstrates how ecological modernization policy strategy has been embraced at these levels. This period is also characterized by the global adoption of sustainable

development as the dominant framework for environmental policy. The simultaneity of these two processes is what lends evidence to the dominance of ecological modernization as a policy strategy to implement sustainable development. The EU example is chosen to be the main focus in the remainder of this analysis, as the EU is an environmental leader in international environmental policy and shapes both the environmental policies of its member states and that of the international community.

VI. Ecological Modernization as Policy Strategy – the EU Example

The introduction of sustainable development into world environmental literature and the adoption of ecological modernization policy strategy have occurred throughout the 1990s almost simultaneously. The vagueness of the official sustainable development definition is a fundamental reason why sustainable development has been adopted by many and became the motto and the policy frame of almost all actors related to environmental policy. With the power to shape national and international environmental policy, most governments have interpreted sustainable development in a way to sideline the ecological and social components of the concept and the normative principles associated with it as well as to eliminate the emphasis on limiting economic growth. Hajer (1995: 31) argues that there are four reasons "why the policy discourse of ecological modernization would appeal to governments". First, governments, faced with criticism of their failure to address environmental problems, wanted to find a solution to the environmental issue. Second, governments were content with the win-win scenario proposed by the ecological modernization discourse. As such, contradictions with the industry would be avoided and economic growth would continue. Third, ecological modernization operated within the existing institutional order. Finally, ecological modernization had also accommodated the radical environmentalism of the 1970s. Furthermore, it fitted to the rise of neo-liberalism in the 1980s (Hajer, 1995: 31-33).

This tendency has also been furthered by the international and supranational organizations such as the UN, OECD and the EU. As such, the development of global environmental governance via the UN Summits, international conventions and also the contributions of other international institutions as well as EU environmental policy followed a track that leaned towards a particular understanding of sustainable development through time. These developments fed the process whereby ecological modernization became the dominant way of interpreting and implementing sustainable development.

The convention of the United Nations Conference on Environment and Development (UNCED) also known as the Earth Summit (1992) has been a

remarkable step in terms of increased interest and activism regarding environment and development issues at the international level. As such, the Earth Summit focused on the environment-development relationship and the ways sustainable development could be promoted (Baker, 2006). The agreements and conventions adopted at the Earth Summit signified the emergence of global environmental governance. In the following period, this governance has been furthered and consolidated by the Earth Summit II (1997), the Johannesburg Summit (2002) and the entry into force of the Kyoto Protocol (2005). In all these conferences, and in the documents published and institutional bodies established thereafter, the importance and arguably precedence of developmental issues over environmental concerns is visible.

The Earth Summit placed the environment on top of the world political agenda. However, the period following the Earth Summit witnessed the withdrawal of bold attempts to achieve sustainable development. Quental *et al*. (2011: 27) argue that "the fear of terrorism and the globalization of economy are probable reasons" for sustainable development falling to the sides vis-à-vis other concerns. When the World Summit on Sustainable Development (WSSD), namely the Johannesburg Summit was convened in 2002, development climbed even higher up the political agenda and was prioritized over environment. In addition, ecological modernization policy strategy became more visible with the Johannesburg Summit. The Plan of

Implementation produced thereafter contained direct references to all the main policy instruments of the ecological modernization policy strategy and perceived environmental sustainability as the "protecting and managing the natural resource base of economic and social development" (UN, 2002: 14). With the globalization of international markets and the promotion of market-based solutions to almost every problem, the private sector became more central to the efforts to achieve sustainable development. Hence, the environmentalism in the Earth Summit was gradually degraded in the time leading up to the Johannesburg Summit.

The trend to perceive environmental protection as both a managerial issue as well as a catalyst for further economic growth, instead of a roadblock against it, is also visible in the recent report prepared by the United Nations Environment Programme (UNEP), *Towards a Green Economy*. The report is an attempt to provide a roadmap to achieve sustainable development and overcome poverty. It is written with an eco-modernist understanding, attested by the formulation of the main environmental problems and ways put forward to solve them in the introduction of the document. Accordingly, the report rejects the 'myths' that economic development and environmental protection are not compatible and that the achievement of a green economy is only possible for the developed countries and argues that the greening of the economy would not only foster economic growth but also increase employment and eliminate poverty with the use of market instruments and an "appropriate regulatory framework" (UNEP, 2011: 3).

The adoption of the ecological modernization policy strategy is perhaps most visible in EU environmental policy. The EU is an important environmental leader and an actor in shaping the global politics of the environment. Therefore, its strategic choices are of crucial importance for an analysis of the dominance of ecological modernization policy strategy. European integration started with an economic orientation. There was a general lack of interest in the environment on behalf of the EU member states until 1972. The main motive behind the early moves for EU environmental policy were related to the overall aim of achieving a common market and preventing market distortions based on environmental reasons. This started to change in 1972 when EU member states convened in Paris to take a common position against the emerging case of environmental deterioration. The Single European Act (SEA) (1986) was a landmark in the development of EU environmental policy as environmental policy became one of the formal policy areas of the EU. This meant that EU action on the environment needed no longer to be based on trade policy. From the SEA onwards, the EU acquired the competence to take environmental measures which did not have to be related to trade issues. Soon after the formulation of the concept, the EU embraced 'sustainable development' and directed its efforts to achieve a sustainable future.

EU environmental policy from the 1990s onwards can be characterized by two major and related trends. The first is the shift of emphasis towards the achievement of sustainable development. Second is the adoption of the ecological modernization policy strategy to achieve sustainable development within the EU (Baker, 2007). The discursive shift to the reinforcing relationship between environmental protection and economic growth is characteristic of EU environmental policy endeavors from the 1990s onwards. This is attested by the ideas and policy orientations behind crucial EU documents, directly or indirectly related to environmental policy, published after the 1990s. Furthermore, the discrediting of traditional command-and-control regulations, the rise of NEPIs, the emphasis on EPI and the importance attached to eco-innovation all represent the elements of this new approach to environmental policy within the EU. Therefore, the EU embraced a weaker version of sustainable development from the beginning of its commitment to the policy.

With the advent of the 2000s, the importance attached to achieving competitiveness and economic growth made this strategy even more detectable in EU environmental policy. Increasingly, environmental policy started to be justified with the economic gains it would bring about. Thus, the discursive components of ecological modernization became the overarching elements of EU sustainable development policy. As such, the EU officially committed itself to sustainable

development while opting for ecological modernization as a discourse and policy strategy to achieve it.

The main turn in the EU towards ecological modernization came with the publication of the Fifth Environmental Action Programme (EAP). Baker (1997: 97) argues that in the Fifth EAP, the way set forward to achieve the twin goals of environmental protection and economic development "is achieved through the reduction of the environmental to the economic". In terms of the range of policy instruments, the Fifth EAP is also a clear move towards the ecological modernization policy strategy. The prescriptions in the first four EAPs were largely based on "legal instruments" (Johnson, 2004: 162). This tendency has changed with the Fifth EAP. The Fifth EAP made strong emphasis on the need to cure the implementation problems through the introduction of NEPIs.

Towards the end of the 1990s, the increasing pace of globalization, the competitive pressures it has brought about, unemployment and concerns regarding the innovative capacity of the EU all culminated in the need to devise a new development strategy that would respond to the abovementioned concerns. This necessity formed the basis of the Lisbon Strategy that was declared in 2000, whereby the EU adopted a "new strategic goal" to be achieved by 2010: "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion" (CoM, 2000: para.5). This goal was to be achieved through research and development, technological innovation, reform of the European social model and macroeconomic policy reform. With this strategy, the EU opted for a growth-oriented future, albeit a sustainable one.

Baker (2007) argues that this turn towards a more growth-oriented and competition-based economic model has fed the Sixth EAP. Indeed, Baker (2007: 307) argues that the "Sixth EAP was designed to support the Lisbon Strategy" which according to her "is further evidence" of the dominance of the ecological modernization policy strategy. The Sixth EAP (2002-2012) had some new important emphases such as the inclusion of the citizens as new environmental actors through the informed choices they are supposed to make in the market place in favor of greener products. This emphasis resonates with the third genre of ecological modernization theory that emphasized the importance of consumption in achieving ecological modernization. Therefore, with the importance attached to consumer choices (as could be understood from its extended title Our Future, Our Choice), the Sixth EAP is an important document that further commits the EU to ecological modernization.

These tendencies are also visible in the 2001 and later renewed 2006 EU Sustainable Development Strategy. The Commission has recently proposed a new strategy for Europe that would replace the Lisbon Strategy. The *Europe 2020 – A Strategy for Smart, Sustainable and Inclusive Growth* was hence adopted by the

European Council in March 2010. The renewed strategy rests on the following "mutually reinforcing priorities":

- Smart growth: developing an economy based on knowledge and innovation.
- Sustainable growth: promoting a more resource efficient, greener and more competitive economy.
- Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion (CEC, 2010: 5).

The priorities of the new strategy reveal that the main emphases of the Lisbon Strategy are kept intact. However, the sustainable development policy of the EU seems to be transformed totally into a strategy of sustainable growth where climate change is chosen to be the primary field of action. Hence, it is safe to argue that with the new strategy, ecological modernization has reached its peak within the EU. At the moment, there are preparations for the Seventh EAP. In the discussion papers provided by the environmental policy actors within the EU, measures associated with ecological modernization form the basis of the pathway put forward to deal with the environmental challenges ahead of the EU. These measures range from the need to increase the role of the market mechanism in environmental policy, relatedly utilizing effective instruments for an efficient environmental policy, achieving resource efficiency as well as the need to achieve sustainable consumption.[2]

The nature of the European integration process renders the adoption of the ecological modernization policy strategy easier than stronger interpretations of sustainable development. European integration is foremost an economic integration project. Even though the EU has acquired political, social and cultural dimensions in the course of its development, economic growth has always been central to the process of integration. Therefore, economic growth is not a target that could be discarded by the EU. Ecological modernization provides the EU with the means and the justification to act in the environmental sphere without contradicting its *raison d'état*, as it is not only an environmental but also and mainly an economic policy strategy. Therefore, justifying strict environmental policy by emphasizing its potential to foster economic growth is completely understandable on behalf of the

[2] For more on the discussions for the Seventh EAP, please see EEB (European Environmental Bureau) (2010). *Future of EU Environmental Policy: Towards the 7th Environmental Action Programme*, available at http://www.eeb.org/index.cfm/activities/sustainability/7th-environmental-action-programme; and also the discussions presented in http://www.eapdebate.org/en/latest-events/.

EU. This discursive orientation to ecological modernization is also visible in terms of the policy components of ecological modernization in EU environmental policy. The analysis of the efforts to realize EPI, introduce NEPIs and promote eco-efficiency at the EU level demonstrates the extent to which EU environmental policy is shaped by the ecological modernization policy strategy. The Cardiff Process, the putting into effect of the EU Emissions Trading Scheme and the introduction of voluntary schemes such as the EU Eco-Management and Audit Scheme (EMAS) and EU Eco-label, and the adoption of the Environmental Technologies Action Plan all provide empirical background to the above argument.

Concluding Remarks – Criticisms against Ecological Modernization

Ecological modernization theory and policy strategy have received ample criticisms. Even though in effect for around 20 years now, the theoretical premises and political implications of ecological modernization are questioned by environmental scholars. To start with, ecological modernization is argued to be Eurocentric (Buttel, 2000; Leroy and Tatenhove, 2000). Ecological modernization theory was developed mainly based on the experiences of Northern European green countries. Even though ecological modernization theory has extended its geographical scope from the 2000s onwards, it is nevertheless argued to be an explanatory device for only a limited number of countries in the world.

In addition, ecological modernization is criticized for lacking any focus on issues of social justice. The normative notions associated with sustainable development such as intergenerational and intragenerational equity are not mentioned in most of the ecological modernization analyses. This implies that the power relations between the developed and developing countries are not questioned in ecological modernization (intragenerational equity), as well as the idea of any kind of limits to economic growth (intergenerational equity). As such, ecological modernization is also not concerned with the issue of development in the global sense. Relatedly, ecological modernization ignores social contradictions not only between developed and developing countries but also within the developed countries. Therefore, it can be concluded that sustainable development is not implemented in a way to cover all the dimensions it originally aimed to incorporate such as equity, social justice, participation and global development with the adoption of the ecological modernization policy strategy.

Another criticism concerns the fact that “aggregate consumption of minerals and other raw materials has continued unabated” despite ecological restructuring and efficiency improvements (Buttel, 2000: 32). This criticism is reminiscent of Jevons’ Paradox, where efficiency in the use of a resource can ultimately result in its overuse (Alcott, 2005).

The main reason behind this is that increased consumption of efficiently produced goods and a concomitant growth of the economy "makes no practical difference" even if resources are used efficiently (Connelly and Smith, 2003: 69). This criticism is also a challenge to the decoupling argument of ecological modernization which implies that economic growth can be achieved without environmental destruction. Connelly and Smith (2003: 68-69) further argue that the decoupling cases observed so far are mostly the result of the exportation of environmental pollution "through a displacement of high energy-consuming and polluting industries to less-industrialised countries". Furthermore, natural resource preservation in the developed world has been achieved at the expense of their exploitation in the developing world (Baker, 2007: 303). Therefore, it can be argued that ecological modernization does not prioritize the issue of the distribution of environmental 'goods' and 'bads'.

In addition, there is the risk that ecological modernization "can serve to legitimate a political culture of environmental policy-making that basically absolves industrial corporations and other agents of environmental destruction of their responsibilities" (Buttel, 2000: 32). This criticism shares some commonalities with the arguments that describe ecological modernization as a new form of capitalist defense against ecological necessities. Baker (2006: 217) argues that the over-emphasis of ecological modernization on the role industry would play in sustainable development policies, poses the danger of presenting MNCs responsible for high levels of environmental destruction "as corporate environmentalists upon whom society can rely to promote sustainable development". This in turn bears the danger of concentrating environmental policy efforts where there is a strong economic rationale, leaving other areas of environmental concern to the sides such as the loss of biodiversity. Furthermore, the emphasis of ecological modernization on the role of environmental technologies and eco-efficiency combined with the lack of a "social critique is likely to reflect prevailing social relations of power" (Warner, 2010: 539).

Leroy and Tatenhove (2000: 197) argue that in its early Huberian version, with an emphasis on taking the state out and letting economic actors in environmental policy, "the ecological modernization theory fitted well with the neo-liberal political offensive of the 1980s". A similar argument is made by Hajer (1995: 32-33) where he argues that ecological modernization cannot only be seen as a way to solve environmental problems, but also as a way to internalize the "environmentalist critique of the 1970s" and to meet "the need to restructure the industrial core of the economy of Western countries". In a similar fashion, Connelly and Smith (2003: 68) argue that "ecological modernisation aims to 'green'

capitalism", but are skeptical about the success of such an attempt. They criticize the approval given to ecological modernization by some environmentalists, on the grounds that this approval would only lead to the legitimization of current environmentally damaging practices:

> Reform-minded environmentalists are enthusiastic in the greening of capitalism, but capitalism it remains. The danger is that the radical critique of the environmental movement is blunted (if not neutralised) and the very structures and institutions responsible for continuing ecological decline are legitimised by apparent green approval. (Connelly and Smith, 2003: 70)

These criticisms highlight important shortcomings and discussions as regards the explanatory breadth of the ecological modernization theory. Some of the criticisms mentioned above are partly met by ecological modernization scholars in their works on ecological modernization beyond Western Europe and also by their emphasis on the importance of a new and clean technology base that would replace all the old technologies that are argued to cause the displacement of polluting industries. However, not all criticisms are or can be met. It is no news to ecological modernization scholars that the theory developed in line with the rising into prominence of neo-liberalism and market-based policies throughout the world. Indeed, ecological modernization theory focused on ways to solve environmental problems without seriously altering the institutional set-up of modern industrial societies. Therefore, these criticisms reflect the truth in an objective fashion. The question however remains as to whether ecological modernization is a viable option for a sustainable future. This mental exercise can even lead to a question as to whether sustainable development is a viable formula in the first place to reverse environmental degradation and preserve world natural capital. Focusing on the former question, the answers vary according to the political positioning of the individual. For some, ecological modernization denotes the transformation of the modern industrial society whereas for others, it is just a 'greening' of capitalism. Both of these positions have explanatory value. Ecological modernization has penetrated into the structure of the modern industrial society, has transformed it and thus greened capitalism. Nevertheless, ecological modernization has been more influential as a policy strategy rather than as a theory that describes social transformations. As a result, it has been more instrumental in 'greening' capitalism rather than transforming modern industrial society.

The main argument of this article has been that ecological modernization policy strategy has become the dominant way to perceive and implement sustainable development throughout the world. This claim is by no means the denial of the efforts to achieve stronger versions of sustainable development in differing contexts. Nevertheless, the analysis of global environmental governance since the 1990s reveals the fact that a weaker interpretation of sustainable development, namely an ecological modernization policy strategy, has been opted for by major environmental policy actors such as the UN, the OECD and the EU due to reasons discussed throughout this article. In addition, a critical analysis of ecological

modernization reveals how the normative aspects and principles associated with sustainable development are assimilated into the win-win scenario and how the 'economic' is prioritized at the expense of the 'ecological' and 'societal'. Such a perspective also reveals how an overemphasis on the efficacy of flexible instruments and eco-efficiency downgrades environmental policy to a managerial issue. As such it is fair to argue that ecological modernization is foremost an attempt to green capitalism rather than challenge its environmental contradictions. Therefore, what has really become the case under the discourse of sustainable development has been a reform of the capitalist system.

This notwithstanding, ecological modernization policy strategy should also be approached from an angle that questions the likelihood or chances of success of a stronger interpretation of sustainable development given the present world economic and political predicament. It should be asked as to whether ecological modernization is a lesser evil. This is by no means to argue that it is preferable to a stronger interpretation of sustainable development. It is rather to put forward a question if pursuing ecological modernization is nevertheless preferable to less attainable alternatives for a sustainable society.

References:

Alcott, B. (2005). Jevons' Paradox. *Ecological* Economics, 54, 9-21.

Baker, S. (1997). 'The Evolution of European Union Environmental Policy – From Growth to Sustainable Development?'. S. Baker; M. Kousis; D. Richardson; S. Young (eds.), *The Politics of Sustainable Development – Theory, Policy and Practice within the European Union*. London and New York: Routledge, 91-106.

Baker, S., Kousis, M., Richardson, D., and Young, S. (1997). 'Introduction – The Theory and Practice of Sustainable Development in EU Perspective'. S. Baker; M. Kousis; D. Richardson; S. Young (eds.), *The Politics of Sustainable Development – Theory, Policy and Practice within the European Union*. London and New York: Routledge, 1-40.

Baker, S. (2006). *Sustainable Development*. London and New York: Routledge.

Baker, S. (2007). Sustainable Development as Symbolic Commitment: Declaratory Politics and the Seductive Appeal of Ecological Modernisation in the European Union. *Environmental Politics*, 16(2), 297-317.

Baker, S. and Eckerberg, K. (2008). 'Introduction: In Pursuit of Sustainable Development at the Sub-National Level: The 'New' Governance Agenda'. S. Baker and K. Eckerberg (eds.), *In Pursuit of Sustainable Development – New Governance Practices at the Sub-National Level in Europe*. London and New York: Routledge, 1-25.

Buttel, F. H. (2000). 'Classical Theory and Contemporary Environmental Sociology: Some Reflections on the Antecedents and Prospects for Reflexive Modernization Theories in the Study of Environment and Society'. G. Spaargaren, A. P.J. Mol and F. H. Buttel (eds.), *Environment and Global Modernity*. London: Sage Publications, 17-39.

CEC (Commission of the European Communities) (2010). *Europe 2020 – A Strategy for Smart, Sustainable and Inclusive Growth*. COM (2010) 2020. Communication from the Commission. Retrieved 08.03.2012, from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:2020:FIN:EN:PDF.

Christoff, P. (1996). Ecological Modernisation, Ecological Modernities. *Environmental Politics*, 5(3), 476-500.

Cole, M. A. (2007). 'Economic Growth and the Environment'. G. Atkinson, S. Dietz, and E. Neumayer, (eds.), *Handbook of Sustainable Development*. Cheltenham and Northampton: Edward Elgar, 240-253.

CoM (2000). *Presidency Conclusions*: Lisbon European Council, 23 and 24 March 2000. Retrieved 22.03. 2011, from http://www.europarl.europa.eu/summits/lis1_en.htm.

Connelly, J. and Smith, G. (2003). *Politics and the Environment – From Theory to Practice*. 2nd ed. London and New York: Routledge.

Dresner, S. (2008). *The Principles of Sustainability*. 2nd ed. London: Earthscan.

Dryzek, John S. (1997). *The Politics of the Earth – Environmental Discourses*. New York: Oxford University Press.

Gouldson, A. and Murphy, J. (1996). Ecological Modernization and the European Union. *Geoforum*, 27(1), 11-21.

Hajer, M. A. (1995). *The Politics of Environmental Discourse – Ecological Modernization and the Policy Process*. New York: Oxford University Press.

Huber, J. (1982). *Die verlorene Unschuld der Ökologie. Neue Technologien und superindustrielle Entwicklung*. Frankfurt am Main: Fisher Verlag.

IUCN (International Union for Conservation of Nature and Natural Resources) (1980). *World Conservation Strategy*. Retrieved: 16 October 2010, from http://data.iucn.org/dbtw-wpd/edocs/WCS-004.pdf.

Jänicke, M. (1985). *Preventive Environmental Policy as Ecological Modernisation and Structural Policy*. Internationales Institut für Umwelt und Gesellschaft (IIUG) Discussion Papers. Wissenschaftszentrum Berlin für Sozialforschung.

Jänicke, M. (1992). Conditions for Environmental Policy Success: An International Comparison. *The Environmentalist*, 12(1), 47-58.

Jänicke, M. (2006). 'Ecological Modernisation: New Perspectives'. M. Jänicke and K. Jacob (eds.), *Environmental Governance in Global Perspective – New Approaches to Ecological and Political Modernisation*. Berlin: Published by Freie Universitaet Berlin Department of Political and Social Sciences, 9-29.

Johnson, D. (2004). 'Ecological Modernization, Globalization and Europeanization – A Mutually Reinforcing Nexus?' J. Barry, B. Baxter and R. Dunphy (eds.), *Europe, Globalization and Sustainable Development*. London and New York: Routledge, 152-167.

Langhelle, O. (2000). Why Ecological Modernization and Sustainable Development Should not be Conflated. *Journal of Environmental Policy & Planning*, 2(4), 303-322.

Leroy, P. and Tatenhove, J. V. (2000). 'Political Modernization Theory and Environmental Politics'. G. Spaargaren; A. P.J. Mol; F. H. Buttel (eds.), *Environment and Global Modernity*. London: Sage Publications, 187-208.

Lélé, S. M. (1991). Sustainable Development – A Critical Review. *World Development*, 19(6), 607-621.

Milanez, B. and Bührs, T. (2008). Ecological Modernization beyond Western Europe: The Case of Brazil. *Environmental Politics*, 17(5), 784-803.

Mol, A. P.J. and Sonnenfeld, D. A. (2000). Ecological Modernisation Around the World: An Introduction. *Environmental Politics*, 9(1), 3-14.

Mol, Arthur P.J. (2002). Ecological Modernization and the Global Economy. *Global Environmental Politics* 2(2), 92-115.

Murphy, J. and Gouldson, A. (2000). Environmental Policy and Industrial Innovation: Integrating Environment and Economy through Ecological Modernisation. *Geoforum*, 31, 33-44.

Naess, A. (1997). 'Sustainable Development and the Deep Ecology Movement'. S. Baker, M. Kousis, D. Richardson and S. Young (eds.), *The Politics of Sustainable Development – Theory, Policy and Practice within the European Union*. London and New York: Routledge, 61-71.

Quental, N., Lourenço, J.M., Nunes da Silva, F. (2011). Sustainable Development Policy: Goals, Targets and Political Cycles. *Sustainable Development*, 19, 15-29.

Rinkevicius, L. (2000). 'The Ideology of Ecological Modernization in 'Double-Risk' Societies: A Case Study of Lithuanian Environmental Policy'. G. Spaargaren; Arthur P.J. Mol; F. H. Buttel (eds.), *Environment and Global Modernity*. London: Sage Publications, 163-185.

Schlosberg, D. and Rinfret, S. (2008). Ecological Modernisation, American Style. *Environmental Politics*, 17(2), 254-275.

Schreurs, M. (31.01.2011). Personal Interview. Freie Universität Berlin.

Simonis, U. E. (1989). *Ecological Modernization of Industrial Society: Three Strategic Elements*. Wissenschaftszentrum Berlin für Sozial Forschung. Science Center Berlin, Berlin.

Söderbaum, P. (2008). *Understanding Sustainability Economics – Towards Pluralism in Economics*. London: Earthscan.

Spaargaren, G. (2000). 'Ecological Modernization Theory and the Changing Discourse on Environment and Modernity'. G. Spaargaren; A. P.J. Mol, and F. H. Buttel (eds.), *Environment and Global Modernity*. London: Sage Publications, 41-71.

Spaargaren, G. and Vliet, B. V. (2000). Lifestyles, Consumption and the Environment: The Ecological Modernisation of Domestic Consumption. *Environmental Politics*, 9(1), 50-76.

Stern, D. I. (2004). The Rise and Fall of the Environmental Kuznets Curve. *World Development*, 32(8), 1419-1439.

Strange, T. and Bayley, A. (2008). *Sustainable Development – Linking Economy, Society, Environment*. Paris: OECD Publications.

Toke, D. and Strachan, P. A. (2006). Ecological Modernization and Wind Power in the UK. *European Environment*, 16, 155-166.

UN (United Nations) (2002). *Plan of Implementation of the World Summit on Sustainable Development*. Retrieved 13.11.2010, from http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf.

UNEP (United Nations Environment Programme) (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication – A Synthesis for Policy Makers*. Retrieved 19.12. 2011, from http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_synthesis_en.pdf.

Warner, R. (2010). Ecological modernisation theory: towards a critical ecopolitics of change? *Environmental Politics*, 19(4), 538-556.

WCED (World Commission on Environment and Development) (1987). *Our Common Future*. New York: Oxford University Press.

Weale, A. (1992). *The New Politics of Pollution*. Manchester: Manchester University Press.