

Reflections on the potentials of ecological modernization as a social theory

FREDERICK H. BUTTEL*

Le domaine de l'environnement suscite de nouveaux concepts scientifiques. La modernisation écologique, élaborée comme une contre-réponse à la sociologie environnementale américaine, en est un. L'auteur, en nous présentant une sorte d'état des lieux de ses différentes utilisations aux États-Unis et dans les pays de l'Europe du Nord, se pose la question de savoir si ce concept restera ce qu'il dénomme une « perspective » ou s'il a le potentiel pour devenir la base d'une véritable théorie sociale. Le concept de « modernisation écologique » est-il appelé à remplacer celui de « développement durable »? Le débat est ouvert.

The rise of ecological modernization as a perspective in environmental social science¹ has been as meteoric as it has been unexpected. Ecological modernization was unknown to virtually all North American environmental social scientists a half-dozen years ago, save for a small handful of comparative politics specialists who were familiar with Jänicke's (1990) work on 'state failure' or environmental studies scholars who had read Simonis' (1989) paper in the *International Social Science Journal*. Now ecological modernization has come to be regarded as being on a virtual par with some of the most longstanding and influential ideas and perspectives in environmental sociology (e.g., Schnaiberg's (1980) notion of 'treadmill of production', and Catton and Dunlap's (1980) notions of Human Exemptionalist and New Environmental Paradigms (see also Dunlap and Catton, 1994)). Over the past 2 years, it has come to be virtually obligatory for professional meetings of environmental social scientists to have one or more sessions devoted specifically

to ecological modernization. Further, while there has been a surprising degree of acceptance of ecological modernization as one of the mainstream environmental-sociological perspectives, the pervasiveness of ecological modernization can be gauged by the fact that a broad range of environmental social scientists have found it necessary to address – even if only to critically respond to – the rising influence of this perspective (see, e.g., Benton, 1997; Harvey, 1996; Schnaiberg et al., 1999; Redclift and Woodgate, 1997; also see Mol and Spaargaren, 2000; Mol, 1999, Cohen, 1997, for summaries of this critical literature and for responses to the major criticisms that have been raised). Ecological modernization has already become featured as an established perspective in the most recent environmental sociology undergraduate textbooks (Harper, 1996; Bell, 1998) and has become a particularly popular topic in the journal *Environmental Politics*. The publication of the special issue of *GeoForum* testifies to the tremendous interest

FREDERICK H. BUTTEL
Professor of Rural Sociology
and Environmental Studies
Department of Rural Sociology
University of Wisconsin,
Madison
1450 Linden Drive
Madison, WI 53706, États-Unis
fbhbuttel@facstaff.wisc.edu

Cet article, paru dans : *GeoForum* 30, *Ecological Modernization as social theory*, 57-65, 2000, est publié avec l'aimable autorisation des Éditions Elsevier Science, Oxford, G.B.

Résumé – Reflections on the potentials of ecological modernization as a social theory

Cet article fournit une vue d'ensemble et une interprétation de la forte montée en puissance de la notion de « modernisation écologique » ces dernières années aux États-Unis et dans certains pays de l'Europe du Nord. L'auteur la considère comme une critique pertinente et créative de la sociologie environnementale qui, en accordant trop d'importance aux causes des dégradations de l'environnement et aux réactions qu'elles entraînent, a sous-estimé l'étude des processus de rénovation environnementale. La modernisation écologique élargit donc l'analyse des problématiques et de ses acteurs à l'État et au capital, au-delà de l'environnementalisme et des mouvements environnementaux, tout en leur concédant une place importante. L'auteur avance que l'une des raisons pour lesquelles la modernisation

écologique est devenue si courante est que le terme lui-même se prête à une grande variété d'utilisations et de significations. Il est suggéré ici qu'il soit réservé aux efforts de théorisation des chercheurs (toutes sciences incluses) qui étudient les conditions par lesquelles les politiques publiques mais aussi ce que l'auteur appelle les processus de « prises de décision privées » – privées étant pris dans le sens à la fois industriel mais aussi individuel du terme – contribuent à la conservation environnementale, en d'autres termes à la « soutenabilité ». À ces fins, il suggère que la nature même de la notion de modernisation écologique l'amène à être une théorie fondée sur l'analyse du politique et de l'État et il fait quelques brèves propositions susceptibles de renforcer cet aspect. L'auteur conclut en faisant remarquer que, en dépit

d'atouts certains, cette notion pose de sérieux problèmes qui ne peuvent être ignorés. Cela inclut une tendance à l'eurocentrisme, une insistance trop grande accordée à l'industrie, à la pollution industrielle au détriment de la consommation des ressources naturelles. Elle peut aussi se faire l'écho d'une vision trop « bénigne » du capitalisme industriel contemporain et surévaluer les possibilités qu'offrent l'écoconstruction, l'écologie industrielle et la gestion environnementale, de contrecarrer les tendances expansionnistes du capitalisme. © 2000 Éditions scientifiques et médicales Elsevier SAS

**modernisation écologique /
soutenabilité / écologie industrielle /
sociologie environnementale / théorie /
État**

¹ In this paper the expression environmental social science will be understood to pertain to the social science disciplines in which ecological modernization perspectives currently play a major role. Ecological modernization has become quite influential within environmental sociology, and to a lesser degree within geography and political science. Because such a large share of the ecological modernization literature (in English) has been authored by sociologists, the discussion in this paper will occasionally refer specifically to the (environmental) sociological literature.

that ecological modernization has stimulated within geography.

A particularly important indicator of the extent to which ecological modernization thought has become influential in the environmental social sciences is the prominence given to Mol's (1997) paper in the recent and widely circulated *International Handbook of Environmental Sociology* (Redclift and Woodgate, 1997). Mol's (1997) paper is one of a handful in the Redclift-Woodgate anthology devoted to a particular theoretical perspective. Not only has ecological modernization very rapidly gained a foothold in environmental sociology and environmental studies, but it has even made some inroads into general sociological scholarship. Perhaps the most telling indicator of the rising influence of ecological modernization is the fact that Anthony Giddens, arguably the most well-known Anglophone social theorist of the late 20th century and a scholar interested in environmental issues and their sociological significance, has devoted ten pages of his *'The Third Way'* (1998) to ecological modernization thought.

This paper will focus on some of the reasons for and implications of the extraordinary ascendance of ecological modernization thought. I will stress that its rapid rise to prominence is due less to ecological modernization having been a well-developed and highly codified social theory, but rather because of how ecological modernization accorded particularly well with a number of intellectual and broader political-economic factors, many of which lay outside the realms of sociology and environmental sociology. I will suggest that while ecological modernization is indistinct as a social theory, ecological modernization's basic logic suggests two points. First, the most sophisticated and persuasive versions of ecological modernization revolve around the notion that political processes and practices are particularly critical in enabling ecological phenomena to be 'moved into the modernization process' (Mol, 1995). Thus, a full-blown theory of ecological modernization must ultimately be a theory of politics and the state – that is, a theory of the changes in the state and political practices (and a theory of the antecedents of these changes) which tend to give rise to private eco-efficiencies and overall environmental reforms. Second, the logic of ecological modernization theory suggests that it has very close affinities to several related literatures – particularly embedded autonomy, civil society, and state-society synergy theories in political sociology – which have not yet been incorporated into the ecological modernization literature. I will conclude by arguing that ecological modernization can benefit by bringing these related – and, for that matter, more powerful – theories into its fold. Further, and perhaps most important, ecological modernization could well succeed or fail as social theory depending on the sturdiness of the bridges that can be built to these parallel theories.

A brief look at the different meanings of ecological modernization

Nearly as remarkable as ecological modernization's rising visibility and influence has been the diversity of the meanings and usages of this concept. Ecological modernization is now employed in at least four different ways. First, there is an identifiable school of ecological modernizationist/sociological thought². From a North American and British perspective Arthur Mol and Gert Spaargaren are now generally recognized as the key figures in the field, though in Germany, the Netherlands, and elsewhere on the Continent ecological modernization is still very closely associated with the work of scholars such as Joseph Huber and Martin Jänicke. Nonetheless, Mol and Spaargaren's singly and jointly authored works (Spaargaren and Mol, 1992, 2000; Spaargaren et al., 1999; Mol and Spaargaren, 1993; Spaargaren, 1996; Mol, 1995, 1997), as well as those of close associates and colleagues (e.g., Cohen, 1997; Leroy and van Tatenhove, 1999), constitute what can be thought of as the core literature of the ecological modernization perspective. In this paper I will primarily build from Mol and Spaargaren's works because of all the scholars and researchers in this tradition (at least as far as the literature in English is concerned) they have done the most to articulate a distinctive theoretical argument.

A second respect in which ecological modernization is employed is as a notion for depicting prevailing discourses of environmental policy. The major figure associated with the political-discursive and social-constructionist perspective on ecological modernization is Maarten Hajer (1995). For Hajer (1995), ecological modernization is not so much a prediction of strong tendencies to industrial-ecological progress as it is a category for describing the dominant discourses of the environmental policy arenas of the advanced countries. In addition to Hajer's constructionism being in stark contrast to the objectivism of the core literature in ecological modernization, Hajer's view is that ecological-modernizationist environmental-political discourse may even serve to dilute the political impulse for environmental reforms by obscuring the degree to which economic expansion, growth of consumption, and capital-intensive technological change compromise the ability of states to ensure a quality environment. Thus, for many observers (including some in the core tradition of ecological modernization) Hajer's social-constructionist work is often thought of as lying outside of – or even being hostile to or incompatible with – the ecological modernization perspective per se.

Third, ecological modernization is often used as a synonym for strategic environmental management, industrial ecology, eco-restructuring, and so on (see Hawken, 1993, Ayres, 1998). Indeed, the core literature on ecological modernization has tended to give primary emphasis to environmental improvements in the private sector, particularly in relation to manufac-

² Note that I use the expression ecological-modernizationist 'thought' or 'perspective', rather than theory, at this point in the paper because of the fact that, at least as far as the literature in English is concerned, ecological modernization is not yet a clearly codified theory. The lack of codification has given rise to the fact that ecological modernization has been used in so many different ways by social scientists. As an example, Redclift and Woodgate (1997) take the core notion of ecological modernization to be the claim that economic growth is compatible with environmental protection, and they equate the perspective primarily with the literature on industrial ecology and 'industrial metabolism'. While one might say that Redclift and Woodgate have simply misinterpreted ecological modernization, one can say that this type of confusion would be very unlikely to occur when environmental social scientists discuss Schnaiberg's (1980) notion of treadmill of production or O'Connor's (1994) notion of the second contradiction of capital.

turing industry and associated sectors (e.g., waste recycling). Social scientists from a variety of theoretical persuasions (e.g., Schnaiberg et al., 1998; Andersen, 1994) now use the notion of ecological modernization to pertain to private sector behaviors and conduct that simultaneously increase efficiency and minimize pollution and waste. Finally, there are some scholars who use the notion of ecological modernization to pertain to almost any environmental policy innovation or environmental improvement. Murphy (1997), for example, refers to state policies that make possible the internalization of environmental externalities as being instances of ecological modernization.

In addition, Mol (1999) has recently felt the need to distinguish between the first-generation of ecological modernization literature (which includes, in particular, the 1980s and early 1990s studies by German and Dutch scholars summarized in Mol, 1995) and the second-generation literature that has appeared in the late 1990s. The first-generation literature was based on the overarching hypotheses that capitalist liberal democracy has the institutional capacity to reform its impact on the natural environment, and that one can predict that the further development ('modernization') of capitalist liberal democracy would tend to result in improvement in ecological outcomes. The second-generation ecological modernization literature, by contrast, has increasingly revolved around identifying the specific sociopolitical processes through which the further modernization of capitalist liberal democracies leads to (or blocks) beneficial ecological outcomes. The most recent ecological modernization literature has been more concerned with comparative perspectives, including but not limited to the ways in which globalization processes might catalyze ecological modernization processes in countries in the South.

Ecological modernization as a policy concept: beyond sustainable development?

Nonetheless, the range of meanings associated with the notion of ecological modernization arguably is related to the fact that the rise of ecological modernization perspectives was not due only or even primarily to the clarity of its theoretical arguments. Indeed, the rise of ecological modernization as a concept has had to do more with the fact that ecological modernization was an effective response to a variety of circumstances or imperatives regarding social-ecological thought in the 1990s. First, the renewal of the environmental movement during the 1980s, on the grounds of global environmental change and growing recognition of ecological and technological risks, suggested to many in the environmental and ecological communities that very radical steps – significant decreases in fossil energy usage, reversal of tropical forest destruction and biodiversity loss, increasingly strict regulation of industry, the localization and decentralization (rather than globalization) of economic activity and social regulation, and so on –

were necessary to address the processes of destruction of the biosphere. These impulses arguably helped to catalyze the rise of radical environmental movements in Northern Europe³. The rise of these environmental movements stimulated scholars such as Beck (1992) to see radical environmentalism as an enduring feature of advanced industrial politics. The growth of these counterhegemonic social-environmental views, many of the most influential of which were given visibility through publication in *The Ecologist* in the UK, led to a growing imperative to address whether they were scientifically sound or robust relative to the more managerial variants of environmental science (e.g., of the sort analyzed in Hajer, 1995). The rise of radical environmental movements also increasingly set the agenda for sociological theory and research as sizable groups of social scientists began to grapple with phenomena such as new social movements (NSMs), 'the risk society', identity politics, subpolitics, and so on (Scott, 1991; Goldblatt, 1996; Martell, 1994). It thus became increasingly incumbent upon social scientists to respond to the rise and growing influence of radical environmental movements, especially in terms of whether radical environmentalism (and radical NSMs in general) would be an ascendant social force and would be a necessary precursor to effective environmental improvement and reform. Accordingly, the growing attention to ecological modernization in German social scientific circles in the 1980s had as much to do with issues that arose from the environmental sciences and from the political realm as it did with considerations from the realm of social theory per se.

Second, despite the very considerable enthusiasm and innovation which had occurred in social-scientific thought and practical policy work as a result of the more widespread use of the concepts of sustainability and sustainable development, it was becoming increasingly apparent that sustainability and sustainable development had real shortcomings in providing guidance and vision for future evolution of environmental policy. Both of these sustainability notions had originally been developed with regard to policy toward the South, and in addition the various notions of sustainability had been derived from experiences involving the primary-renewable sectors in nonmetropolitan or rural places in the South. Ecological modernization provided a template for new thinking about the problems and their solutions that are most urgent to address in the transformative sectors of metropolitan regions of the advanced industrial nations.

Third, it had become increasingly apparent that North American dominance of environmental-sociological theory had led to certain biases and blinders. The rise of ecological modernization can be seen as a response to a particularly crucial shortcoming of North American environmental sociology. While North American environmental sociology was quite diverse, most of its major theoretical works had converged on the notion that environmental degradation was intrinsically a product of the key social dynamics (be they the treadmill of production, the 'growth machine', the persistence of the dominant social para-

³ Mol (1997: 33,58), for example, portrays radical environmentalism in terms of eco-centric ideologies which are deployed in pursuit of 'de-industrialization' agendas, and mentions the 'deep ecology' movement as being the prototypical radical environmental movement. While Mol acknowledges respect for radical environmentalism for its efforts to legitimize notions of ecological rationality, he suggests that the radical environmental position is not a realistic one to the degree that it insists that ecological rationality must be substituted for (rather than being balanced with or weighed against) private economic rationality. It should also be noted that Joseph Huber's original contributions to ecological modernization thought were reactions to the anti-modernist views of key ('fundamentalist') figures such as Rudolf Bahro (1984). Ecological modernization has thus been closely identified with the realist wing within the fundamentalist-realist divide within the German Green Party.

digm or of anthropocentric values, and so on) of 20th century capitalist-industrial civilization. In straining to account theoretically for why the US and other advanced industrial societies were inexorably tending toward environmental crisis, North American environmental sociology found itself in an increasingly awkward position: environmental sociologists had so overtheorized the intrinsic tendency to environmental disruption and degradation so that there was little room for recognizing that environmental improvements might be forthcoming. And the only way out of the 'iron cage' of environmental despair was a rather idealistic – if not utopian – view of environmental movements as the only recourse for environmental salvation (Buttel, 1996, 1997). Ecological modernization not only provided a way for environmental sociologists to more directly conceptualize environmental improvement; ecological modernization also provided a fresh perspective on the role of environmental movements by avoiding their romanticization, and by appreciating the particularly fundamental roles that science, technology, capital, and state might play in the processes of environmental improvement.

In particular, by the mid-1990s it had become increasingly apparent that North American environmental–sociological scholarship needed to take better into account the considerable environmental progress that countries such as Germany, the Netherlands, and Switzerland had made – at least relative to the far more modest environmental progress which had been achieved in North America. Northern European environmental progress had not been confined to pollution abatement and control, but also extended to eco-efficiency improvements which had been made in manufacturing industry (Simonis, 1989; Hawken, 1993)⁴. But by the early 1990s these developments had remained largely ignored in mainstream North American environmental–sociological literature. Ecological modernization provided a way to understand these eco-industrial improvements while doing so in a way more satisfying than the ecological microeconomics of Hawken (1993) and the more mainstream environmental economists.

The growing embrace of ecological modernization thought by the global environmental–sociological community thus fulfilled a wide variety of needs and filled several gaps in social–environmental thought. Even so, this embrace has remained relatively superficial, being confined mainly to acceptance of the notion that substantial eco-efficiency gains can be made through further (or 'super-') industrialization within capitalism. Thus, for example, Schnaiberg et al. (1998) have felt quite comfortable appropriating the notion of ecological modernization to depict successful instances of post-consumer waste recycling, while at the same time retaining the concept of treadmill of production (which Mol, 1995, sees as an example of deterministic neo-Marxist environmental sociology) as their main explanatory device. Most observers of the ecological modernization perspective – be they proponents, critics, or those interested in exploring the potentials of this perspective – have tended to evaluate it in terms of the third and fourth

uses of the notion of ecological modernization noted above. Specifically, the questions most often asked are, 'Is ecological modernization actually occurring?' or 'Is there good reason to believe that we can expect trends toward ecological modernization in a significant number of economic sectors and world nations?'

Ecological modernization: a critical analytical tool for contemporary social-political processes

The next section of the paper will be based on the notion that the first meaning of ecological modernization – that of a distinctive, though incipient social theory with the potential to create a coherent literature through hypothesis testing – is the more fundamental and useful one. Thus, while the environmental–economic and environmental–engineering conceptions of ecological modernization have tended to predominate in sociological usage of the notion of ecological modernization, I would suggest that the following are the more important postulates of a distinctive and coherent ecological modernization perspective. An ecological modernization perspective hypothesizes that while the most challenging environmental problems of this century and the next have (or will have) been caused by modernization and industrialization, their solutions must necessary lie in more (rather than less) modernization and 'superindustrialization'. Put somewhat differently, it is hypothesized that not only is capitalism sufficiently flexible institutionally to permit movement in the direction of 'sustainable capitalism' (to turn O'Connor's (1994) notion on its head), but its imperative of competition among capitals can (under certain political conditions) be harnessed to achieve pollution-prevention eco-efficiencies within the production process, and ultimately within consumption processes as well (Spaargaren, 1996). Thus, second, social theory must recognize and directly theorize the role that capitalist eco-efficiency and rationalization can play in environmental reform (as well as recognize their limits and the degree to which they can or must be induced by the state). Third, ecological modernization is in some sense a critical response to – if not a decisive critique of – radical environmentalism (or 'countermodernity'). As Mol (1995) notes, "the role of the environmental movement will shift from that of a critical commentator outside societal developments to that of a critical – and still independent – participant in developments aimed at ecological transformations." Fourth, an ecological modernization perspective views the environment as in potentiality or in practice being an increasingly autonomous (or 'disembedded') arena of decision-making (what Mol refers to as the 'emancipation of ecology').

Fifth, and perhaps most fundamental, is that ecological modernization processes are a reflection of policy environments that are made possible through

⁴ I am indebted to an anonymous reviewer who stressed that it is useful to recognize that there are two related, but quite separate streams of research and practice that are typically subsumed under the more general category of eco-efficiency. The first, which has been actively promoted by the World Business Council for Sustainable Development (<www.wbcsd.ch> and is increasingly gaining attention among management consultants, is that of 'strategic environmental management'. Strategic environmental management is primarily concerned with achieving fewer externalities, greater eco- or environmental efficiencies, and 'green marketing' advantages within the context of existing plant and equipment. By contrast, 'industrial ecology' refers to a more ambitious agenda of fundamental redesign of industrial structures and processes (including industrial relocations and production synergies) aimed at achieving the dematerialization of production, and ultimately the dematerialization of society (see Ayres, 1998).

the restructuring (or 'modernization') of the state. Thus, in Mol's (1995) words:

The ecological modernization theory has identified two options for strategies to overcome the deficiencies of the traditional bureaucratic state in environmental policy-making. First, a transformation of state environmental policy is necessary: from curative and reactive to preventive, from exclusive to participatory policy-making, from centralized to decentralized wherever possible, and from domineering, over-regulated environmental policy to a policy which creates favorable conditions and contexts for environmentally sound practices and behavior on the part of producers and consumers. The state will have to widen the competence of civil law in environmental policy, focus more on steering via economic mechanisms and change in its management strategy by introducing collective self-obligations for economic sectors via discursive interest mediation. The second, related, option includes a transfer of responsibilities, incentives, and tasks from the state to the market. This will advance and accelerate the ecological transformation process, mainly because the market is considered to be a more efficient and effective mechanism for coordinating the tackling of environmental problems than the state... The central idea is not a withering away of the state in environmental management, but rather a transformation in the relation between state and society and different accents on the steering role of the state. The state provides the conditions and stimulates social 'self-regulation', either via economic mechanisms and dynamics or via the public sphere of citizen groups, environmental NGOs and consumer organizations.'

As successful as ecological modernization has been as a school of environmental-sociological thought, it is at risk of ultimately suffering the same fate as its predecessor sister concept, sustainable development (SD). Though proponents of the SD notion benefited by its having had the imprimatur of SD being endorsed by an impressive range of institutions and international organizations (e.g., the United Nations and UNCED, the World Bank, the European Union), SD has slowly but surely begun to recede from the social-scientific radar screen. This has in large part been because of the fact that the SD concept could not overcome being seen as a nebulous knowledge claim which was too imprecise to generate a coherent set of hypotheses and body of research. Perhaps recognizing this, some of ecological modernization's most innovative thinkers, particularly Arthur Mol (1995) and Gert Spaargaren (1996), have devoted considerable effort to aiming to anchor ecological modernization within extant social theory.

Mol and Spaargaren's efforts at theoretical buttressing of ecological modernization have yielded certain successes. Mol and Spaargaren have noted that ecological modernization has parallels to a variety of classical theorists and influential theories (e.g., Schumpeter's (1939) and Kondratieff's (1979) notions of long cycles, Polanyi's (1957) notion of 'disembedding', and Giddens' (1994) four dimensions of modernity). Arguably, however, they have tended to link

ecological modernization most closely to the work of Ulrich Beck, particularly his well-known writings on reflexive modernization and risk society (Beck, 1992; Beck et al., 1994).

There are some good reasons why Mol and Spaargaren would choose to link ecological modernization with the work of Beck. The Netherlands and Germany (the countries of greatest interest to Mol-Spaargaren and Beck, respectively) have a number of structural similarities. While their political systems exhibit major differences (e.g., the Dutch state is highly centralized while state governments play a major role in Germany), both are parliamentary democracies within which environmental ideologies are firmly established within their national political cultures. Beck is among the most influential and visible social theorists in Northern Europe, and linking ecological modernization to Beck's thought would no doubt be a plus in the mainstreaming of ecological modernization thought within European sociological circles. Not only was Beck an influential general sociological theorist in the 1980s, but by the early 1990s Beck was arguably beginning to displace Schnaiberg, Dunlap, Catton and other North Americans as the most influential environmental-sociological theorist in Europe. Thus, linking ecological modernization with Beck's work would create legitimacy and an entrée for this new perspective within environmental sociology and sociology at large.

In some ways ecological modernization can be thought of as an instance of Beck's (1992) notion of reflexive modernization – through which modernization can be 'turned back on to itself' in order to address the problems which it has itself created. There is also a sense in which Mol and Spaargaren share Beck's skepticism about the efficacy of radical environmentalism. There are additional similarities in their views about how the role of states in advanced capitalism is changing (in particular, the shift toward less bureaucratization and centralization). Perhaps most fundamentally, Mol-Spaargaren and Beck agree that solutions to the problems caused by modernization, industrialization, and science can only be solved through more modernization, industrialization, and science.

These similarities between ecological modernization and Beck's theories of reflexive modernization and risk society notwithstanding, there are several reasons why I believe that ecological modernization cannot rest its main theoretical case on reflexive modernization – or, in other words, on notions that derive directly or indirectly (e.g., via Giddens (see Beck et al., 1994; Giddens, 1994)) from Ulrich Beck. There are some very considerable inconsistencies between ecological modernization and Beck's notions of reflexive modernization and risk society – many of which Mol (1995) and others readily acknowledge. Among the more salient of these differences are the following. While Mol and Spaargaren place relatively little emphasis on the role of radical environmental groups or new social movements (NSMs) in making possible ecological modernization processes, the lynchpin of Beck's work is the increasingly important

role being played by NSMs and subpolitics in the restructuring of the state and political discourses. The arenas of environmental mobilization and reform emphasized by Mol and Spaargaren also bear little similarity to those such as anti-nuclear and anti-biotechnology protests that are of particular concern to Beck. The very concept of 'risk society' conjures up an adherence to matters of identity politics and extra-scientific policymaking that contrasts with the image of environmental improvement stressed by Mol and Spaargaren. And while Beck points to a sharp distinction between 'industrial society' and 'risk society', the thrust of core ecological modernization thought is that eco-efficiency gains can be achieved without radical structural changes in state and civil society. In addition to these areas of incompatibility between Mol-Spaargaren's ecological modernization perspective and Beck's theory of risk society, it is also worth noting that Beck's work has become somewhat passé in the late 1990s, and has generated very little interest in North America, so there is even less reason to anchor ecological modernization thought in the work of Beck (and of Giddens' forays into reflexive modernization).

Northern Europe: a way forward for ecological modernization?

If ecological modernization has conceptual appeal but requires more social-theoretical foundations, which way to turn? I would argue that guidance on this score can be derived from Mol and Spaargaren's own work – namely, from the stress they have placed on the types of state structures, policy networks, and policy cultures which are required to propel forward processes of ecological modernization. Their (or at least Mol's) thinking on this score is indicated quite clearly in the lengthy quote from Mol's (1995) *The Refinement of Production* earlier in the paper. This lengthy quoted passage, I would argue, is strikingly compatible with the works of scholars such as Evans (1995, 1996, 1997) who have developed a set of inter-related notions of embedded autonomy and state-society synergy. In particular, Evans (1995) and the core thinkers of ecological modernization share very similar ideas about state effectiveness and state-civil society ties. Mol (1995) and Leroy and van Tatenhove (1999), for example, place a great deal of stress on the role that advocacy-coalition-type relations among state officials, corporate managers, and environmental NGOs play in making possible ecological modernization processes.

Evans' (1995) work can perhaps best be characterized as a neo-Weberian perspective on the state which at the same time is distanced from much of late 20th century neo-Weberian political sociology (as well as structuralist Marxism) through its critique of 'state-centeredness' or state autonomy being primarily properties of the state itself. Prior to publication of Evans' *Embedded Autonomy*, there had been a strong consensus among 'theorists of the state' (including

both Weberian proponents of state-centeredness as well as neo-Marxist structuralists) that large centralized states that are relatively autonomous from groups and classes in civil society are best able to formulate and implement coherent and authoritative policies. In Evans' (1995) book he argued instead that while the organization of the state does affect the capacity of states to 'construct markets and promote growth' (1995), state effectiveness derives equally from the nature and quality of its relations with (rather than its autonomy or insulation from) groups in civil society. Evans (1995) thus defines embedded autonomy as a state structure which combines 'corporate coherence'⁵ on one hand, and connectedness of, and social ties between, state agencies and officials and various groups in civil society on the other.

Evans in his *Embedded Autonomy* (1995) aims to develop evidence that the 'developmental states' in the South which were successful in achieving rapid industrial development in the 1970s and 1980s tended to have embedded-autonomous structures, involving both corporate coherence and connectedness to groups in civil society. In Evans' subsequent work (1996, 1997) on state-society synergy, which he conceptualizes as a particularly important form of embedded autonomy, he focuses on how the development of concrete sets of social ties between states and groups in society creates 'synergies'; on one hand, these ties between states and societies help make states more effective, and on the other hand these ties help various groups in civil society to better meet their goals. It is worth noting that while Evans' (1995) early work on embedded autonomy considered economic growth and industrial development to be the ultimate indicator of state effectiveness⁶, Evans has increasingly seen 'sustainability' (particularly 'urban sustainability' or 'livability') as being as or more important as a dimension of state effectiveness (see Evans, 1997; Buttel, 1998).

It is also worth noting that many of the concerns of Evans and other theorists of embedded autonomy and state-society synergy (see especially the works by Evans' colleagues in his 1997 collection) were in some sense anticipated by Jänicke (1990) – a political scientist and one of the German founders of ecological modernization – in his work on 'state failure'. Not only does Jänicke (1990) stress the theme of the need for closer state-society ties in a manner similar to Evans, but Jänicke stresses the fact that environmental policy is among the arenas in which these ties are particularly crucial in order to achieve policy effectiveness (or, in other words to overcome state failure). Thus, not only is neo-Weberian embedded-autonomy theory highly consistent with ecological modernization, but one of its founders – Martin Jänicke – has written in a parallel vein, albeit at a lower level of abstraction than achieved by Evans.

Ecological modernization has tended to be appropriated by environmental sociologists, geographers, and political scientists mainly because of its provocative and challenging views about the malleability of the institutions and technological capabilities of industrial capitalism, and because of its observations from environmental science and engineering that eco-effi-

⁵ Evans means 'corporate coherence' in the Weberian (legal-rational authority) sense – that is, the cohesion among state officials which reflects commitment to the state and its goals, which in turn is made possible by meritocratic recruitment and a long-term career reward structure.

⁶ Evans' (1995) initial work on embedded autonomy and developmentalist states stressed state ties with what he called 'developmental elites', while in Evans' (1996, 1997) more recent work on state-society synergy and urban sustainability in the South he gives more stress to community and neighborhood (including shantytown) leaders and activists.

ciencies can fairly readily be achieved within the framework of continued modernization of capitalism and the application of modern experimental science. Ecological modernization is a new, and in many ways an improved, synonym for sustainable development. At the same time ecological modernization is more useful than sustainable development as a macro or overarching framework for thinking about the environmental problems of metropolitan transformative industry in the North. As much as any of these factors, perhaps, ecological modernization has become attractive as a concept because it provides alternatives to the pessimistic connotations of frameworks such as the treadmill of production and the growth machine. Ecological modernization expresses hope, and makes it more readily possible to identify and appreciate the significance of environmental success stories.

Ecological modernization thought, however, has not developed to a point where one can say that it shares an identifiable set of postulates and exhibits agreement on research hypotheses and research agenda in the same way that one can do so for a theory such as the treadmill of production. In large part this is because ecological modernization did not develop primarily from a pre-existing body of social-theoretical thought – as, for example, was the case with the treadmill of production (Schnaiberg, 1980) having been largely derived from O'Connor's (1973) influential theory of the accumulation and legitimation functions of the state and how their contradictions tend to become manifest in state fiscal crisis. Instead, ecological modernization thought has been more strongly driven by extra-theoretical challenges and concerns (e.g., about how to respond politically to radical environmentalism and how to conceptualize eco-efficiency improvements that are currently deriving from new management practices and technical-spatial restructuring of production). Ecological modernization has essentially been an environmental science and environmental policy concept which has subsequently been buttressed with a number of citations to social-theoretical literatures, some of which are mutually quite contradictory (compare Beck versus Jänicke, for example).

While Beck and related theorists of reflexive modernization (especially Giddens) have been cited most often within the core ecological modernization literature as theoretical exemplars, there are a number of reasons why Beck, and his notions of risk society, subpolitics, and so on, are unlikely to be sturdy theoretical foundations for ecological modernization. I would argue that ecological modernization is ultimately a political-sociological perspective, for reasons that are made clear in the lengthy quote from Mol (1995) earlier in the paper. And the political-sociological theory with which it has closest potential relations – and, in some sense, which reflects its own origins in the work of Jänicke – is the neo-Weberian tradition of embedded autonomy and state-society synergy. I would argue that the way forward for ecological modernization is not to emphasize empirical debates over the potentials and limits of environmental engineering and industrial ecology, but rather

to deepen the links to political-sociological literatures which will suggest new research problems and hypotheses. Embedded autonomy and state-society theorizing, while they are not without problems (Buttel, 1998), are particularly well suited to comparative analysis, which is a particularly exciting research frontier for ecological modernization research.

Current or prospective enthusiasts for ecological modernization-driven inquiry should recognize, however, that this perspective has some important shortcomings that need to be squarely addressed. These include the perspective's (Northern) Eurocentricity (the fact that its theoretical roots and empirical examples are largely taken from a set of Northern European countries that are distinctive by world standards), the excessive stress on transformative industry, the preoccupation with efficiency and pollution control over broader concerns about aggregate resource consumption and its environmental impacts, the potentially uncritical stance toward the transformative potentials of modern capitalism, and the fact that very fundamental questions raised about modernizationism within the development studies literature (e.g., Hoogvelt, 1987; Pred and Watts, 1992) have not been addressed within ecological modernization theory.

It should also be noted that while we can agree with the ecological modernizationists that radical environmentalism may not be directly responsible for many of the environmental gains achieved in Northern Europe and elsewhere, these nonmainstream ecology groups arguably play a significant role in pushing mainstream environmental groups and their allies in the state and private industry to advance a more forceful ecological viewpoint. Thus, radical environmental groups, by providing alternative vocabularies and 'frames' of environmentalism, stressing issues often ignored within mainstream environmentalism, and providing new loci of personal identity for citizens, will tend to strengthen the movement as a whole, and thus indirectly contribute to ecological modernization processes. It is worth noting, in fact,

Abstract – Reflections on the potentials of ecological modernization as a social theory

This paper provides an overview and interpretation of the dramatic rise to prominence of ecological modernization perspectives during the late 1990s. Ecological modernization can be seen as a pertinent and creative response to the tendency of prevailing environmental-sociological theories to stress the causes of environmental degradation and to downplay processes that lead to solutions to environmental problems. Ecological modernization has also been a creative response to important dilemmas about the role that environmentalism and environmental movements are playing in environmental reform. In this paper the author suggests that the term ecological modernization should be reserved for social-scientific efforts to theorize the conditions under which public policies and private decision-making contribute to environmental conservation (or, in other words, to 'sustainability'). He concludes by noting that despite the strengths and attractions of ecological modernization, this perspective continues to have several problems and shortcomings that must be addressed. © 2000 Éditions scientifiques et médicales Elsevier SAS

ecological modernization / sustainability / industrial ecology / environmental sociology / theory / state

that in the US the environmental groups that are most concerned about toxics and chemicals – the primary preoccupation of ecological modernizationists – are not the mainstream environmental groups, but rather local (particularly ‘environmental justice’-oriented) groups which are most radical and often thought as being out of the movement mainstream (Gottlieb, 1993). In sum, as the social science community moves rapidly to explore the new ecological modernizationist viewpoint, it should do so with awareness of both its strengths and weaknesses.

Acknowledgment

A previous version of this paper was presented at the School of Natural Resources and Environment (SNRE), University of Michigan, October 1998. The author would like to thank the SNRE faculty and graduate students, William Freudenburg, two anonymous GeoForum reviewers, Jenny Robinson, and Joseph Murphy for their comments and suggestions on previous versions of this paper.

REFERENCES

- Andersen M. S. 1994. *Governance by Green Taxes*. Manchester University Press, Manchester.
- Ayres R. U. (Ed.), 1998. *Eco-Restructuring*. United Nations University Press, New York.
- Bahro R. 1984. *From Red to Green*. Verso, London.
- Beck U. 1992. *Risk Society*. Sage, Beverly Hills, CA.
- Beck U, Giddens A., and Lash S. (Eds.), 1994. *Reflexive Modernization. Policy*, Cambridge.
- Bell M. 1998. *An Invitation to Environmental Sociology*. Pine Forge Books, Thousand Oaks, CA.
- Benton T. 1997. *Reflexive modernization or green socialism?* paper presented at the RC-24 Conference on Sociological Theory and the Environment, Woudschoten Conference Center, Zeist, Netherlands.
- Buttel F. H. 1996. Environmental and resource sociology: theoretical issues and opportunities for synthesis. *Rural Sociology* 61, 56–76.
- Buttel F. H. 1997. *Social institutions and environmental change*, *The International Handbook of Environmental Sociology*, M. Redclift and G. Woodgate (Eds.), Edward Elgar, London, 40–54.
- Buttel F. H. 1998. Some observations on states, world orders, and the politics of sustainability, *Organization & Environment* 11, 261–286.
- Buttel F. H. 2000. Ecological Modernization as Social Theory, *Geoforum* 30 (1), 57–65.
- Catton W. R., Jr., Dunlap R. E. 1980. A new sociological paradigm for post-exuberant sociology, *American Behavioral Scientist* 24, 14–47.
- Cohen M. 1997. *Sustainable development and ecological modernisation: national capacity for environmental reform* OCEES Research Paper No. 14, Oxford Centre for the Environment, Ethics, and Society, Oxford.
- Dunlap R. E., Catton W. R. Jr. 1994. Struggling with human exemptionalism: the rise, decline and revitalization of environmental sociology, *The American Sociologist* 25, 5–30.
- Evans P. 1995. *Embedded Autonomy*. Princeton University Press, Princeton.
- Evans P. 1996. Government action, social capital, and development: reviewing the evidence on synergy, *World Development*, 24, 1119–1132.
- Evans, P. (Ed.) 1997. *State-Society Synergy*. Institute for International Studies, University of California, Berkeley.
- Giddens A. 1994. *Beyond Left and Right*. Stanford University Press, Stanford, CA.
- Giddens A. 1998. *The Third Way*. Polity, Cambridge.
- Goldblatt D. 1996. *Social Theory and the Environment*. Westview Press, Boulder, CO.
- Gottlieb R. 1993. *Forcing the Spring*. Island Press, Washington, DC.
- Hajer M. 1995 *The Politics of Environmental Discourse*. Oxford University Press, New York.
- Harper C. L. 1996. *Environment and Society*. Prentice-Hall, Upper Saddle River, NJ.
- Harvey D. 1996. *Justice, Nature and the Ecology of Difference*. Blackwell, Oxford.
- Hawken P. 1993. *The Ecology of Commerce*. HarperCollins, New York.
- Hoogvelt A. 1987. *The Third World in Global Development*. Macmillan, London.
- Jänicke M. 1990. *State Failure*. Pennsylvania State University Press, University Park, PA.
- Leroy, P., van Tatenhove J. 1999. *New policy arrangements in environmental politics: the relevance of political and ecological modernization*, In: *Environmental Sociology and Global Modernity*, G. Spaargaren et al. (Eds.). Sage, London.
- Martell L. 1994. *Ecology and Society*. University of Massachusetts Press, Amherst.
- Mol A. P. J. 1995. *The Refinement of Production*. Van Arkel, Utrecht.
- Mol A. P. J. 1997. *Ecological modernization: industrial transformations and environmental reform*, In: *The International Handbook of Environmental Sociology*, pp. 138–149, M. Redclift and G. Woodgate (Eds.). Edward Elgar, London.
- Mol A. P. J. 1999. *The environmental state in transition: exploring the contradictions between ToP and EMT*, paper presented at the International Sociological Association (RC 24) conference on ‘The Environmental State Under Pressure’, Chicago.
- Mol A. P. J., Spaargaren G. 1993. *Environment, modernity and the risk society: the apocalyptic horizon of environmental reform*, *International Sociology*, 8, 431–359.
- Mol A. P. J., Spaargaren, G. 2000. *Ecological modernization theory in debate: a review*, *Environmental Politics* (forthcoming).
- Murphy R. 1997. *Sociology and Nature*. Westview Press, Boulder, CO.
- O’Connor J. 1973. *The Fiscal Crisis of the State*. St. Martin’s Press, New York.
- O’Connor J. 1994. *Is sustainable capitalism possible?*, In: *Is Capitalism Sustainable?* pp. 152–175, M O’Connor (Ed.) Guilford, New York.
- Polanyi, K. 1957. *The Great Transformation*. Beacon, Boston.
- Pred A., Watts M. (Eds.) 1992. *Reworking Modernity*. Rutgers University Press, New Brunswick, NJ.
- Redclift M., Woodgate G. 1997. *Sustainability and social construction*, In: *The International Handbook of Environmental Sociology*, pp. 55–70, M. Redclift and G. Woodgate (Eds.), Edward Elgar, London.
- Redclift M., Woodgate G. (Eds.) 1997. *The International Handbook of Environmental Sociology*. Edward Elgar, London.
- Schnaiberg A. 1980. *The Environment*. Oxford University Press, New York.
- Schnaiberg A., Weinberg A., Pellow D. 1998. *Ecological modernization in the internal periphery of the USA*, paper presented at the annual meeting of the American Sociological Association, San Francisco.
- Schnaiberg A., Weinberg A., Pellow D. 1999. *The treadmill of production and the environmental state*, paper presented at the International Sociological Association (RC 24) Conference on ‘The Environmental State Under Pressure’, Chicago.
- Schumpeter J.A. 1939. *Business Cycles*. McGraw-Hill, New York
- Scott A. 1991. *Ideology and the New Social Movements*. Unwin Hyman, London.
- Simonis U. E. 1989. Ecological modernization of industrial society: three strategic elements. *International Social Science Journal* 121, 347–361.
- Spaargaren G. 1996. *The Ecological Modernization of Production and Consumption*. Ph.D. thesis, Wageningen University.
- Spaargaren G., Mol A. P. J. 1992. Sociology, environment, and modernity: ecological modernization as a theory of social change, *Society and Natural Resources* 55, 323–344.
- Spaargaren G., Mol A. P. J., Buttel F. H. (Eds.) 1999. *Environmental Sociology and Global Modernity*. Sage, London, forthcoming.