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# Green Economics

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**ABSTRACT:** Economists assume that people are fundamentally greedy, though not exclusively so. If environmental improvement is to be achieved, it will require policies that use selfishness rather than opposing it. Such policies are to be found in the basics of green economics in which market signals are modified by environmental taxes and tradeable pollution certificates to 'decouple' the economic growth process from its environmental impact. Green economic policies avoid the infringements of human liberties implied in ever stronger 'command and control' measures.

**KEYWORDS:** Sustainability, market based instruments, command and control.

## INTRODUCTION - THE MEANING OF GREEN ECONOMICS

Rather like 'sustainable development', 'green economics' has come to mean all things to all men. But I detect a basic issue common to all forms of green economics.

Green economics implies a rethink of the idea that we should design economic systems to meet the unconstrained desires of *Homo economicus*, whereby the economic person is assumed to weigh up the costs and benefits to himself or herself and to act so as to maximize the net benefits to the self. Typically, this interpretation is not so much interested in the *fact* that people frequently behave according to non-selfish interests, as in urging the economic person to be *even less* motivated by selfish concerns and *more* motivated by non-selfish concerns.

Crudely put, people are greedy and they should be less greedy. Being less greedy means getting individuals to modify their own behaviour. Most of the green economics debate is about:

the *extent* of the modification, and

*how to achieve* the modification.

What is it that green economists want to achieve? A green economy is one that has the capability of replicating itself on a sustainable basis. *Sustainability* is therefore a second common feature of all green economics.

A third common feature arises from the fact that, while the form of an economy changes over time, its chances of self-replication will greatly increase the lower is the ratio of materials and energy to economic output over time. However economic output is measured, the essential feature of the green economy is the systematic *decoupling of rates of change in economic output and the environmental assets used up in that process*. This green economy is therefore consistent with non-declining human welfare and with the sustainable use of natural resources.

These three features:

- \* constraining human greed
- \* sustainability
- \* decoupling

are common to all forms of green economics. Outside of these features, there are marked variations in advocacy.

One major focus is on the issue of *scale*. Many environmentalists argue that decoupling takes us only part of the way to a sustainable green economy. Scale refers to the magnitude of economic output and its rate of change, and, typically, to the level and rate of change in population. Some advocates suggest that absolute levels of scale should not decline, but neither should they increase. This is the *zero economic growth* (ZEG) and *zero population growth* (ZPG) school of thought, although it does little justice to this viewpoint to suggest that zero growth in scale is all that is required for sustainability.<sup>1</sup> *Zero increase in scale* (ZIS) advocates would typically argue for decoupling as well. More radical still are those who argue for reductions in the absolute level of activity, negative change in economic output and reduced population levels – negative increase in scale (NIS).

Being less greedy contrasts with what O’Riordan and Turner call ‘cornucopian technocentrism’ which tells us to be as greedy as before, if not more so.<sup>2</sup> Any problems arising will be solved by technology. In this free for all, the strong will survive, the weak may well go to the wall. This is what my colleagues and I call the ‘unfettered free market’ philosophy.<sup>3</sup> Free markets have beneficial effects on the environment only if individuals think and act green. The green consumer, green investor, green citizen and green employee are of course powerful agents for a green economy. Otherwise, unfettered free markets tend to be the enemy of the environment and hence the enemy of green economics. I do not believe in leaving the fate of the environment to unfettered free market forces.

At the risk of oversimplification, there are two broad reasons in green economics as to why people should be less greedy. First, people should be less

greedy because other people matter and greed imposes costs on these other people. Particular reference groups in this respect are the world's poor and future generations to come. I take this view to include those who adopt 'stewardship' motives for care of the planet, where the stewardship is on behalf of future generations. I also take it to encompass any view that speaks of fairness between generations, i.e. intergenerational equity. Second, people should be less greedy because other living things matter and greed imposes costs on these other beings. I take this view to encompass stewardship on behalf of the planet itself – Gaianism – through gradations of non-anthropocentric concern up to 'deep ecology'. Needless to say, variants of these views are easy to establish. One might believe one or both the reasons for being less greedy. One might also argue that some environmental problems threaten immediate damage to ourselves. Typically, however, 'concern for others' characterizes green economics.

#### DIFFERENT APPROACHES TO THE GREENING OF THE ECONOMY

There is a tendency for those who profess the wider concept of concern for others to embrace more extensive intervention in the functioning of the economic system. At the extreme, therefore, we have wholesale intervention in the form of dictating what people should do with respect to car travel or energy consumption or family size. Such extensive 'command and control' approaches might of course also reflect differing interpretations of the time available to make social adjustments and/or the scale of the threat that exists. The social costs of this command and control approach – in the form of loss of human freedoms – are not always discussed. In other cases the social costs of this kind of social engineering are defined away: if only we change the minds and motives of people they will not experience any regret. There will be no social costs.

One depressing feature of this apparent gradation of 'greenness' is that it results in competition for the moral high ground. I am somehow holier and greener than you the more I embrace command and control approaches; the more severe I think the impending crisis is, the more self-righteous I am, and the louder I shout. In this respect there are occasions when environmentalists actually do harm to the causes they espouse.

Figure 1 shows a possible categorization of the various approaches, ranging from total non-intervention on the left hand side to extensive command and control on the right. It is not meant to be comprehensive, but illustrative. So far, I have discussed the various schools of thought other than the one marked 'constant capital'. I shall now turn to that because it defines my own standpoint as set out in *Blueprint for a Green Economy*. The reader will note that it is comfortably in the middle.

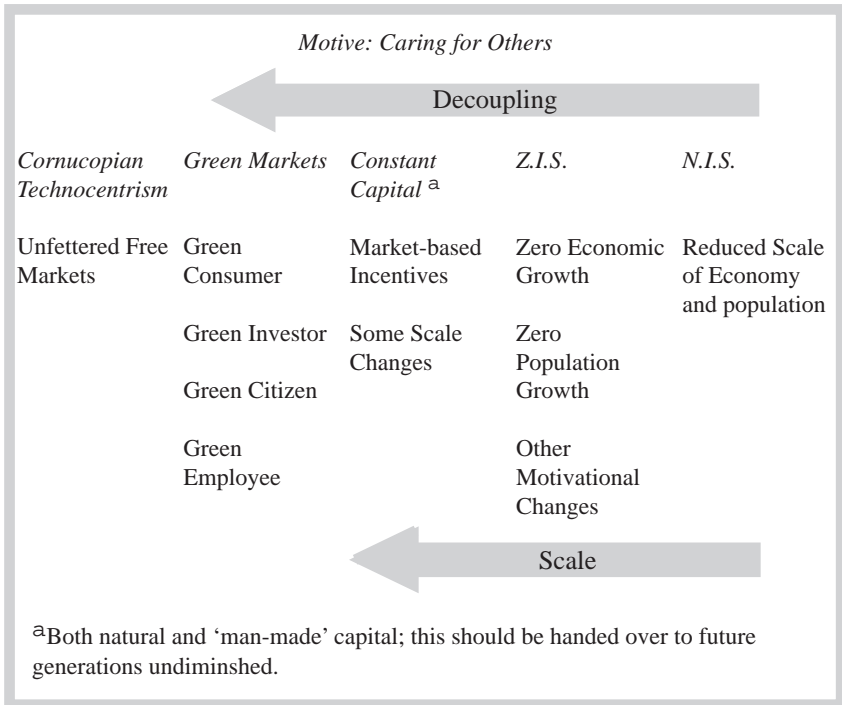


FIGURE 1.  
Schools of Thought Within Green Economics

THE GREEN ECONOMY: A MIDDLE WAY

In *Blueprint* my colleagues and I set out what we regard as a reasonably coherent set of policies designed to decouple economic activity and environmental impact.

The Issue of Valuation

We sought also to argue that environmental conservation is *economically important*. We did not mean by this that conserving the environment results in cash flows, although it may well do. To the economist, economic value arises if someone is made to feel better off in terms of their wants and desires. The feeling of wellbeing from contemplating a beautiful view is therefore an economic value, as is the feeling of wellbeing I get from an unblemished glass of Talisker or Gewurtztraminer. Positive economic value – a benefit – arises when people feel better off, and negative economic value – cost – arises when

they feel worse off. It is as simple as that. Would that some of our critics took the trouble to investigate the meaning of economic value.

There is, of course, the view that we ‘cannot value the environment’. But the meaning of this objection is not always clear, and confusion has arisen because economists have themselves used slipshod language. What economic valuation does is to measure *human preferences* for or against changes in the state of environments. It does not ‘value the environment’. Indeed, it is not clear exactly what ‘valuing the environment’ would mean.<sup>4</sup> In measuring preferences, economists do no more than market researchers do when assessing the market for existing or new products. Few people regard market research as unscientific or invalid.

Once the nature of economic valuation is clear, continued objection must mean one of the following things:

- (a) the exercise of seeking measures of individuals’ willingness to pay for environmental quality is itself somehow flawed. There are indeed technical problems in validating the measures obtained – i.e. in determining whether they are ‘true’ valuations or not (see below);
- (b) that the fate of environments should not be determined by human wants at all;
- (c) that human wants matter, but are not the *only* source of value. For example, there exists something called ‘intrinsic’ value, value ‘in’ things rather than ‘of’ things.

Proposition (a) is not the dominant reason behind the objections to valuation. Proposition (b) is clearly untenable if there is to be any semblance of democracy, and, in any event, would rule out the objectors’ preferences as well (unless they can justifiably claim to be speaking uniquely ‘on behalf of’ the environment in some selfless sense). Proposition (c) appears to explain much of the objection, but it is invalid as an objection to *economic* valuation. Economists do not deny that ‘other’ values exist. They make no claim to be working with other values, only economic values – i.e. preference-based valuations. Intrinsic and economic values may therefore co-exist. Practical issues do of course arise, since *someone* still has to say what these intrinsic values are and how they trade-off against other values (e.g. the rights of trees to exist and the rights of people to a livelihood).

There *are* of course criticisms of actual valuation procedures, and of the legitimacy of some responses, particularly where the valuation exercise relates to environmental assets of which the respondent has little or no direct experience. But as in any social science in which the laboratory is the real world of human behaviour, we cannot expect accuracy in the sense of the physical sciences. Valuations do vary with the degree of information and disinformation in the possession of the respondent, but then so do political preferences and so do decisions to buy goods in the supermarket – just think of eggs and Perrier water. The fear may be that the economist will deliberately bias the results of such a

valuation exercise. That is a risk, but it is a risk that can be minimized by proper scientific enquiry and cross-examination.<sup>5</sup> Accuracy can also be tested in other ways and the literature is replete with such tests.

Let me offer one very real-world reason why valuation matters. In the rich world and poor world, politicians and their advisors are engaged in the activity of trading off environment against economic activity. That is a daily experience. Defending the environment means presenting the arguments in terms of units that politicians understand. For the development option it is simple. It is a matter of jobs, or exports, or simply giving people what they invariably want – a better material standard of living. The environmental case looks weak in terms of those units of importance – it seems to detract from employment, it cannot be exported and it does not result in cash flows. Assembling the case for the environment, then, means assessing what people want. That means looking at opinion polls, hearing views at public inquiries, responding to the environmentalist lobbies, and so on. It can also mean finding measures of public preference for the environment expressed in the same units as the development option – money. The economic valuation exercise appears as another input to the information gathering and decision making process. In short, the problem for the politician is one of deriving evidence that the trade-off of environment for development is worthwhile. I have never suggested that economic valuation is the *only* criterion for making decisions,<sup>6</sup> nor does *Blueprint* say this. But adducing evidence that the environment does matter in economic terms is important, especially as the record of decision-making in the absence of such valuations is hardly encouraging for the environment.

One wonders, for example, what might have happened if the M3 motorway inquiry in the UK had sought a valuation of the option of a tunnel as opposed to a surface road over the South Downs. This was the option finally chosen, which will destroy a significant environmental asset. The extra cost of the tunnel is £92 million, or, say, £7.5 million p.a. as an annuity over 50 years. A valuation exercise could at least have asked whether people were willing to pay this extra to preserve the down.

The valuation issue is important, but it is perhaps worth pointing out that even if valuation is rejected, there remains a powerful case for the rest of the ‘middle way’ approach to a green economy.

### Scale

*Blueprint* does discuss the issue of scale in terms of the size of the economy. It does not discuss population size. The reasoning here is simple. It was a report about the UK economy and UK environment, not about the global environmental problem or the developing economies. It is, of course, perfectly legitimate to raise the question of what an optimal population size is for the UK. Currently at 56.2 million, the UK population will now stabilize, subject to immigration.<sup>7</sup>

Perhaps it should be less, but it is not at all obvious that deliberately reducing it further will produce net benefits given the existing and projected age structure of the population.<sup>8</sup>

As to economic growth, the available evidence is that stricter and stricter environmental programmes will have some impact on economic growth as traditionally measured.<sup>9</sup> But to argue that growth and environmental quality are compatible, provided the right mix of policy measures is adopted, is very different from arguing that environmental quality costs nothing in terms of GNP. The latter is probably an untenable proposition in developed economies, though very tenable in the developing world. Indeed, as *Blueprint* argues, growth and environment are complementary in much of the developing world, just as the Brundtland Commission argued.<sup>10</sup> Of course, debating the nature of the trade-off between growth and environment is misleading given that we now have widespread agreement that change in GNP is not a satisfactory measure of economic progress. but, like it or not, 'real wealth versus the environment' is how many politicians still characterize the issue.

### Market Based Instruments

One important argument in *Blueprint* is that decoupling of growth and environmental impact is feasible by changing the mix of environmental policy instruments. In particular, the aim should be to adopt measures such as:

- \* pollution charges, whereby polluters are taxed according to polluting outputs, emissions, or polluting inputs;
- \* tradeable emission reduction certificates;
- \* deposit - refund systems to encourage recycling;
- \* financial assistance where external benefits are concerned, e.g. hedgerows;
- \* the removal of environmentally harmful subsidies, such as those contained in the European Community's Common Agricultural Policy.

The purpose of these *market based instruments* (MBIs) is that they enable the true cost of production to be reflected in market prices, where the true cost is measured by:

$$P = MC + MEC + MUC$$

and:

P = price

MC = marginal (private) costs of production

MEC = marginal external cost of production

MUC = marginal user cost, i.e. the value of future benefits forgone by using a resource now.



The MUC component is relevant when thinking about the proper pricing of natural resources. For products, MUC is assumed to be included in the pricing on inputs used to make the product.

Of course, if there is to be 'ideal' pricing, MEC requires a measure of the value of the environmental damage done by the product, so we are back to the valuation issue. In practice, I would expect most pollution charges to be aimed at pushing the market in the right *direction* rather than at securing an optimal outcome. This, indeed, is the way environmental taxes have begun to be developed in Scandinavia and continental Europe.<sup>11</sup>

As far as tradeable emission reduction certificates are concerned, they work by setting quotas for emissions or 'harvests' of natural resources. Anyone emitting or harvesting less than their allocated quota secures a 'credit' which they can then sell. The price of the credits in the market place will, under some circumstances, tend to equality with the optimal tax that would be imposed if the tax solution were imposed.

The challenge, then, is to find the right 'mix' of command and control and MBI approaches to securing environmental quality. It is not an issue of *all* command and control or *all* MBIs.<sup>12</sup> The main reasons for seeking a better mix are:

- \* MBIs serve to keep down compliance costs. With the real prospects of rising environmental standards and hence costs of control, this is important;
- \* MBIs serve to 'force' technology on a continuous basis, i.e. the polluter has a repeated incentive to look for cleaner and cleaner technology.

While both these points are standard textbook observations, they have empirical support in the experience so far obtained with the use of MBIs. Table 1 shows a listing of the ratios of compliance costs for command and control solutions and efficient market based approaches. Without doubt, Table 1 exaggerates the benefits of MBIs, but even if we accept the low ratios, we see that existing environmental policies could be of the order of twice as expensive as MBI approaches.<sup>13</sup> Other writers have shown that technological change has been faster under MBI régimes than under traditional 'command and control'.<sup>14</sup>

## SUSTAINABLE DEVELOPMENT: CAN IT BE ACHIEVED?

There is one apparent weakness with the middle-way approach to securing sustainable development: we do not know if it will work. But then, we do not know that anything else will work either. What we do know is that the current path has all the signs of being *unsustainable*. If we begin to ask why, we can readily see that it reflects two underlying 'failures' - the failure of the market place to account for the environment, and the failure of governments to manage

Study	Pollutants Covered	Geographical Area	CAC Benchmark	Ratio of CAC Cost to Least Cost
Atkinson and Lewis	Particulates	St. Louis	SIP Regulations	6.00 <sup>a</sup>
Roach <i>et al.</i>	Sulphur dioxide	Four corners in Utah	SIP regulations Colorado, Arizona and New Mexico	4.25
Hahn and Noll	Sulphates standards	Los Angeles	California emission	1.07
Krupnick	Nitrogen dioxide regulations	Baltimore	Proposed RACT	5.96 <sup>b</sup>
Seskin <i>et al.</i>	Nitrogen dioxide regulations	Chicago	Proposed RACT	14.40 <sup>b</sup>
McGartland	Particulates	Baltimore	SIP Regulations	4.18
Spofford	Sulphur dioxide	Lower Delaware Valley	Uniform percentage regulations	1.78
	Particulates	Lower Delaware Valley	Uniform percentage regulations	22.00
Harrison	Airport noise	United States	Mandatory retrofit	1.72 <sup>c</sup>
Maloney and Yandle	Hydrocarbons	All domestic DuPont plants	Uniform percentage reduction	4.15 <sup>d</sup>
Palmer <i>et al.</i>	CFC emissions from non-aerosol applications	United States	Proposed emission standards	1.96

CAC = command and control, the traditional regulatory approach; SIP = state implementation plan; RACT = reasonably available control technologies, a set of standards imposed on existing sources in non-attainment areas.

<sup>a</sup> Based on a 40 micrograms per cubic metre ( $\mu\text{g}/\text{m}^3$ ) at worst receptor.

<sup>b</sup> Based on a short-term, one-hour average of  $250 \mu\text{g}/\text{m}^3$ .

<sup>c</sup> Because it is a benefit-cost study instead of a cost-effectiveness study, the Harrison comparison of the command-and-control approach with the least-cost allocation involves different benefit levels. Specifically, the benefit levels associated with the least-cost allocation are only 82 per cent of those associated with the command-and-control allocation. To produce cost estimates based on more comparable benefits, as a first approximation the least-cost allocation was divided by 0.82 and the resulting number was compared with the command-and-control cost.

<sup>d</sup> Based on 85 per cent reduction of emissions from all sources.

TABLE 1.

Relative Costs of Command and Control and Efficient Policy Instruments

the economy with the environment in mind.<sup>15</sup> Correcting these two failures must therefore raise the chances of getting on to a sustainable path. That means the correct pricing of goods and resources, better appraisal of capital investments, the ‘environmental training’ of macroeconomists, and registering the change by redesigning the presentation of statistics about economic progress. *Blueprint* dealt with all of these issues.

It may be that the ‘middle way’ is insufficient. Maybe the problem of scale dominates and as fast as we lower the coefficient between growth and environment the scale effect will put us back on some path to doom. We do not know because we have not tried. The problem is that we have not tried the alternatives either. Relying on some spontaneous spiritual green uprising could be risky - it may not happen. Relying on forcible change in attitudes presupposes two imponderables: that people will take it, and that the costs in terms of the suppression of human freedoms are outweighed by the benefits of extended survival. I hope we do not have to make that choice. For the foreseeable future, my view is that we do not have to.

## NOTES

This paper constitutes the substance of an address given to the IBC Technical Services Seminar on "Environmental Economics" in London on May 18th, 1990.

<sup>1</sup> An elegant statement of this viewpoint is in Daly and Cobb, 1989.

<sup>2</sup> See O’Riordan and Turner, 1983.

<sup>3</sup> Pearce, Markandya and Barbier, 1989.

<sup>4</sup> An illustration of the muddle that non-economists get into on economic valuation is provided by John Adams’s (partial) review of *Blueprint* (Adams, 1990).

<sup>5</sup> The fear of manipulation of results seems to underlie some of the concerns in Bowers, 1990. Bowers’s other concerns seem to relate to ‘accuracy’, but he nowhere refers to the various tests of accuracy, e.g. using different valuation techniques and comparing the results with theoretically expected differences in outcome, or making tests with real money. These are the subject of a substantial literature.

<sup>6</sup> Yet this is how a significant number of commentators have construed *Blueprint*. Perhaps the misconception arises from a limited reading. Some evidence for this can be adduced from the fact that many comments were made before the book version of the report was published, and by people who physically did not possess a copy of the original report to the Department of the Environment!

<sup>7</sup> It is projected to be 55.9 million in 2025. See World Resources Institute and IEED, 1989.

<sup>8</sup> Bowers (1990) remarks that ‘The Pearce Report is silent on population issues’. The UK orientation of the Report explains why. Global environmental issues are dealt with in Pearce, 1991. Sustainable development in the developing world is the subject of a further volume by the *Blueprint* team (Pearce, Barbier and Markandya, 1990).

<sup>9</sup> Pearce, Markandya and Barbier, 1989, chapter 1. *Blueprint* does *not* argue that environmental policy has zero cost in terms of GNP. It says we can have growth in GNP

and a non-deteriorating environmental quality, not *maximal* growth and a non-deteriorating environment.

<sup>10</sup> World Commission on Environment and Development, 1987.

<sup>11</sup> See Pearce and Barbier, 1990.

<sup>12</sup> See *Blueprint*, where on p.170, for example, we cite the challenge as being: ‘environmental policy now needs to be *supplemented* by more market-based approaches’ (my emphasis). A number of critics seem to think we recommended wholesale substitution of MBIs for the existing system. Bowers (1990) points out, in general correctly, that tradeable certificates may have limited use in the water pollution case. A case study of an actual (and very limited) use of water pollution trades is given in Hahn, 1989. Bowers seriously understates the case for tradeable certificates by ignoring, totally, air pollution.

<sup>13</sup> The exaggeration arises because the MBI solutions are simulated using programming approaches and these are widely held to produce unachievable ideals.

<sup>14</sup> See, for example, Tietenberg, 1990.

<sup>15</sup> One more oddity of Bowers’s review of *Blueprint* is that he appears to believe that it deals only with the failure of markets. Yet the early chapters are all about the necessity of reworking macroeconomic control of the environment to include environmental impacts, i.e. correcting ‘government failure’.

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