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The Employment Effects of Sustainable Development Policies

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ABSTRACT

As ecological economists we research passionately those issues that will give us a clearer understanding of the complex interaction between the economy and the environment. We believe this to be vital for implementing environmental policies that will have fewer unanticipated or irreversible side effects. However, this paper will argue that whilst we are absorbed in this task, we are tending to ignore some of the simpler political realities associated with attempts to implement sustainable development. When governments reduce access to a threatened natural resource such as groundwater or forests, those who do not share the ecological economist's views, or those who simply have not stopped to think about it, see only the immediate impacts of the loss of jobs and reduced income multiplier effects in regions. Media reporting of only the most explosive aspects of issues exacerbates a loss of popular support for conservation measures. The debate surrounding the Tasmanian timber industry in the 2004 federal election in Australia provides a graphic example.

Acknowledging this phenomenon, this paper argues that it is time for ecological economists to bring the employment impacts of sustainable development policies to the forefront of the research agenda. As a contribution in this regard, the paper examines, at both the macro and micro level, the evidence on the employment impacts of sustainable development policies. The paper speculates as to winners and losers in the job market and examines options that may serve to ameliorate negative employment impacts. The paper concludes that a better understanding of the issues, clear and consistent structural adjustment policies, and especially forward planning to anticipate problem areas (e.g. disposing of budget surpluses in ways that can defuse structural adjustment issues) must replace piecemeal, 'knee-jerk' reactions to local political or environmental crises.

Therefore, it is the political economy of implementing policies designed to achieve a sustainable scale of economic activity that is vitally important. Insufficient attention to the political sensitivity of job losses will, we believe, jeopardise the attainment of sustainable scale.

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INTRODUCTION

If there is one criticism that might be made of the work of ecological economists in general, it is the relative lack of attention devoted to economic policy; specifically policy initiatives to smooth the progress to sustainable scale. Where there has been discussion of policy it has tended to be at an abstract level without giving any real consideration to the political economy of implementation.

Take the preservation of old growth forests, for example. This is a priority for ecological economists, not least, because we have only just begun to understand the valuable ecosystem services they provide. We continue to research such vital areas believing that it will help policymakers to recognise the short-sightedness of cutting down old growth forests, particularly when they are to be used for wood chips. Yet a key dimension is largely absent in our theorising; viz. political reality. As Joan Robinson is generally attributed with saying: 'The answer to every economic problem is a political question', an observation that, ironically, she makes in her critique of the neo-classical paradigm, given this particular brand of economics was developed specifically to ignore such questions. Ecological economists must be wary of falling into the same trap.

Recent events in Australia provide us with a stark reminder of this. If, in one of the richest countries in the world, an area of old growth forest in Tasmania can be sacrificed for wood chips, and this is allowed to happen purely for short term political gain, then the ecological economics scientific community clearly needs to work a lot harder to get its message across. In the Australian 2004 federal election campaign, the issue was presented, rather melodramatically in the media, as one of 'jobs versus the environment'. It was 'jobs' that won the day.

The Tasmanian case provides a graphic example where attempts to preserve natural capital – one of the 'prudent minimum conditions' of sustainability theory (strong sustainability) (Costanza 1992) – did not even 'get to first base' because the employment issues were not addressed. This should be of no real surprise given that one of the key macroeconomic variables that governments all around the world focus upon is employment. Yet, within the ecological economics scientific community, the discourse on the subject is quite limited. Clearly, the scarcity of academic literature is not an indication of the importance of the topic. Structural unemployment is inevitable if societies are to become ecologically sustainable, and most will agree that winning popular acceptance of sustainable development is unlikely if it means individuals and, in some cases, whole communities have to sacrifice their livelihoods and self-respect to achieve it.

Structural adjustment of economies is hardly a new phenomenon and, if anything, in an increasingly dynamic, economically-integrated world it has become more frequent. People have lost their jobs because of technological change, because of trade liberalisation as tariff barriers have tumbled, and because of globalisation as business processes have been outsourced to lower cost centres in the developing world. Structural adjustment arising from a commitment to sustainable development policies is no different in that some jobs will be lost – not only in the extraction sectors – and others will be created elsewhere. What does make it different, however, is that whereas the free-marketeers pay little attention to the effects of social dislocation arising from

the liberalisation of international trade and investment, ecological economists consider distributive justice to be of paramount importance. One would expect, therefore, to see measures introduced which attempt to make structural adjustment proceed more smoothly, with the minimum of political fall-out.

Prompted by the events in Australia, we asked ourselves several interrelated questions about the employment effects of implementing sustainable development policies: At the macro level, is an increase in unemployment inevitable? How can we make judgements about this and what macroeconomic, institutional or cultural factors might permit or prevent it? What does a more ecologically benign development strategy look like exactly? What principles need to be observed and what policies must be in place? What industries and which firms will be laying off workers and where might new jobs be created? Finally, what are the defining characteristics of a structural adjustment policy capable of smoothing the progress to a sustainable scale in a just and efficient way?

This paper represents a modest attempt to address these questions, but perhaps more importantly, it is an appeal to others to share this research agenda to increase our collective knowledge so that situations like the one described in Tasmania may be avoided in the future. In the section following this introduction (section 2), we begin by re-iterating what we know from ecological economic theory about the sort of economic policies required to move an economy towards a more sustainable scale. In section 3, we turn to the macroeconomic implications of the employment impacts of such policies. This then leads us in section 4 to an examination of microeconomic, or firm level initiatives, and how changes in firms' business models; specifically, what they produce and how they are organise, might impact upon employment. Section 5 of the paper considers the implementation issues associated with structural adjustment if an economy's transition to more sustainable development is to be managed effectively. In doing so, this final section examines what, if anything, we have learned from those European economies that appear to be leading the way in this regard. The paper concludes that the political difficulties associated with structural adjustment to an ecologically sustainable economy can be significantly ameliorated with forward planning on the part of the state, and a commitment to dispose of budget surpluses in a strategic manner rather than simply providing tax cuts to high and middle income earners as is the current trend in Australia.

AN OVERVIEW OF POLICY PRESCRIPTIONS FOR SUSTAINABLE DEVELOPMENT

While there is considerable latitude for the design of policy instruments that advance ecologically sustainable development, there are some important basic principles which policy makers might usefully observe (Daly and Farley, 2004: 360-363). These include: (1) keeping one independent policy instrument for each policy goal (e.g. not expecting the market to produce both efficient allocation and sustainable scale); (2) permitting micro-variability within the macro limit (e.g. allowing firms as much scope as possible to adjust to their individual circumstances); (3) leaving a margin for error in setting biophysical limits; (4) being cognisant of historical context and introducing policies gradually; (5) designing policy instruments to adapt to unforeseen circumstances; and (6) aligning the domain of the policy-making unit with

the domain of the problem the policy is supposed to address (e.g. a local problem invariably requires a local solution).

With these six guiding principles in mind, the goal of policy makers is sustainable scale. In simple terms, if the marginal benefits of economic growth are greater than the marginal costs of growth, the scale of economic activity is excessive. The benefits of growth accrue in the form of the welfare provided by goods and services, while the costs of growth include private industry costs and environmental costs associated with the utilisation of non-renewable resources, exploitation of renewable resources beyond their regenerative rates, and any diminution in the capacity of the earth's sinks (the oceans, atmosphere, rivers, land-fills). When optimal scale is exceeded, the earth's ecosystem (containing the economic subsystem) is 'full' (Daly and Farley 2004).

If it is accepted that optimal scale has been exceeded and the ecological life support systems are close to collapse – or even if we do not believe this but wish to observe the precautionary principle – the basic theoretical requirement of sustainability policies must be to limit the throughput within the economic system (Daly and Farley 2004). Throughput is the total resource consumption, the flow of raw materials and energy through the economy into the global ecosystem's sinks. Limiting throughput in order to sustain natural capital (the basis of all man-made capital), preserves options for future generations.

Attempts to control throughput can take place at two points: the point at which throughput enters into the economic system (e.g. resource extraction quotas) or where it exits the economic system back into the containing environment (e.g. pollution taxes). Depending on how an input is sourced and used, and its impact on the environment, a range of policy options is available.

In theory, depletion controls are easier because the number of entry points of a natural resource into the economic system is less than the number of places where pollution could occur (Daly and Farley 2004: 365). Input quotas have another advantage over pollution taxes in that, as population and consumption levels increase over time, this puts extra pressure on a resource which, in turn, may necessitate the raising of pollution taxes, with the attendant political difficulties. In the case of direct controls on inputs, on the other hand, any increases in demand automatically translate into higher prices within the economy as higher demand is constrained by fixed supply. An added benefit is that there is greater certainty regarding the amount of a resource being used.

In practice, however, policy-makers are bound by the legislative and public policy milieu in which they operate and, in keeping with policy design principle number (4) outlined above, they will be sensitive to historical context and what is socially and politically palatable. In a post-Thatcherite, market-oriented world, this equates with a general philosophical aversion to command-and-control type policies. This is not to rule out this type of policy option completely, but at this historical juncture, policy instruments that harness the market mechanism gain most approval.

For example, cap and trade pollution permits are currently very popular as environmental policy instruments (OECD 2002, 2004). This is an instrument that works

at the throughput exit point, but it does at least place an upper limit on the amount of pollution, thereby providing an element of certainty in that regard. It is also a policy instrument that satisfies design principle (2) in that firms can manoeuvre under the overall limit, those finding it too costly to change techniques trading with those that can abate at a lower cost. Within the upper limit placed on pollution permits, if there is an increase in firms wishing to pollute (or if existing firms wish to expand their pollution rights), stronger demand for permits should translate into higher prices for permits. Indirectly, these higher prices then raise the cost of using the resource or process causing the pollution.

Taxes, quotas on extraction, and cap and trade permits all require carefully designed government legislation but they are still termed 'market-based instruments' because they rely on the forces of supply and demand to effect change. As von Weizsäcker *et al* (1997: 143) put it, they rely on the 'creative use of market forces … to harness their ingenuity, rapid feedback and diverse, dispersed, resourceful, highly motivated actors' – the actors being profit motivated businesses and want-satisfying consumers. As noted above, all these policy instruments for limiting throughput will cause the price of the respective resources to rise when demand for them presses against a limited supply. The amount by which each resource will rise in price will depend on the demand for it and the (constrained) amount available. Reluctant to bear this higher cost, businesses and households will search for ways of using lesser quantities of the higher priced resources. The search for new technologies that avoid using the resources, or use less of them, will then begin when existing machines and other forms of man-made capital need replacing or become uneconomic. As these decisions take place – across all sectors of the economy – the structure of the economy gradually changes.

Interestingly, some recent empirical studies have added force to the theoretical justification for raising the price of throughput as a central tenet of sustainability policy. A team of physicists and economists (Kummel *et al* 2002; Kummel *et al* 2000; Hinterberger *et al* 2002; Spangenberg *et al* 2002) have investigated the contribution to total production of various inputs over a long period of time in several countries. Assuming a fairly simple production function ($Q = f(K, L, E)$ where K = man-made capital, L = labour and E = energy) for a nation as a whole, they collected data on quantities of inputs – physical units of energy, hours of labour, and amounts of capital – and on total outputs, and estimated the contributions of each factor to value added.
The results of their research showed that the contribution of energy is much higher than previously thought. The contribution of labour, on the other hand, is much lower. The key point to observe here, though, is the impact of the distorted relative prices of the inputs. Historically, the price of energy has not reflected its true cost, so it is inevitable that its contribution to value-added should be high. It is equally inevitable that the owners of capital have benefited considerably from this. Labour, too, has been a beneficiary of the surplus value – albeit to a lesser extent – in that it has been possible for its price to be higher, relative to energy at least. This 'bounty' in production, contributed by energy, but accruing to other factors has become a convention that is no longer tenable. There are now good reasons why this practice should change: first, it encourages over-exploitation of energy and the concomitant loss of eco-system services; and second, it has created strong incentives to develop technologies which favour energy at the expense of labour.

With respect to the over-exploitation of energy, which has in the past been fossil fuel energy, Kummel *et al* (2002: 12) note that there have been new inventions in recent years, described as a 'rich basket of hardware and software that can minimise energy consumption, emissions and costs', that have not been able to compete successfully with the fossil fuel based energy. Ecological economics theory tells us that, with taxes on these fuels, the more sustainable energy options are afforded a much better chance of competing.

Intuitively, this bounty in production offered by energy resources must also apply to the factor of production land more broadly, the same principle applying to other natural resources that are used up incidentally or at an artificially low cost. The prices of services offered by natural capital assets like forests and waterways (including products for use in production processes) understate their true value added because they have been superabundant in the past. The invention of technologies to replace labour, which has occurred steadily since the late 18th century is, of course, described in the literature as a 'rapid increase in the productivity of labour'; that is, an ability to produce far more output with much less labour. As the invention of technologies such as this is no longer desirable, a strong case exists for making energy and other natural resources more expensive in order to reflect their true value added.

Kummel *et al* (2002) also argue that the natural resources of the earth belong to all its inhabitants, and everyone is entitled to a share of the proceeds derived from taxes that price resources closer to their true contribution to production (see Groscurth 1998: 240). That is, even if people do not work, they are entitled to a lump sum share of the proceeds from the earth's bounty. To refine this suggestion a little, given the importance of political perceptions of the trade-off between employment and the environment and, indeed, the high social costs of unemployment in its own right, if part of the proceeds of taxes (and other measures) on throughput are applied to lowering the costs of labour to employers, then incentives to retain labour will be stronger. Ecological tax reform (ETR) – taking taxes off 'economic goods' and increasing taxes on 'economic bads' (Repetto *et al* 1992; Lawn 2000) – also referred to as 'tax shifting' (Brown 2001), aims at the simultaneous realisation of environmental and other policy goals by changing the composition of taxes but not the overall level of taxation. Shifting the tax burden from labour to natural resources represents a particularly attractive proposition in that two of society's ills (unemployment and environmental degradation) can be addressed concurrently in a revenue-neutral way (the so-called 'double dividend' argument).[2] Widely accepted among the ecological economists, the challenge is to convince those outside of the scientific community of its merits.

THE MACROECONOMICS OF SUSTAINABLE DEVELOPMENT POLICIES: THE EMPLOYMENT EFFECTS

Intuitively, ETR policies appear an attractive proposition. Taxing throughput and recycling the proceeds to lower the cost of labour to employers presents the 'win-

[2] Note, however, that ETR is a policy 'package' rather than a single policy. In keeping with policy design principle number (1), the objective of natural resource conservation is to be met by policy instruments (tradable permits, depletion quotas, and so on) that cause the price of materials and energy to rise. Over time, decisions made in the market then 'process' these changed price relativities. The objective of assisting employment is to be met by a policy of deliberately reducing the taxes on labour (e.g. lowering payroll tax, or other non-wage costs employers must pay to hire labour). Again, the market then takes account of these altered factor price relativities.

win' scenario of providing a disincentive to pollute and deplete while simultaneously providing an incentive to employ labour. Verification of this proposition using economy-wide econometric models is possible, and although such models are very much dependent on the parameters used and the assumptions they contain about the workings of an economy, they are instructive when running simulations because they can often reveal useful insights, where partial equilibrium analysis cannot.

Modelling studies are surveyed in McEvoy *et al* (2000), Jackson (2000), Jacobs (1994) and Bosquet (2000). In general, it seems that economic instruments which link revenue recycling to lowering labour costs for employers, do confirm positive employment effects (McEvoy *et al* 2000: 30). Although it is infrequently mentioned, one insight that many studies do reveal is that it matters very much what is assumed about the starting conditions in an economy, particularly about the existing tax and subsidy distortions. This seems logical, and one is reminded about the urgent need to address, or at least take account of, the very large subsidies that many countries have on energy and other materials (see OECD 2003) before designing ETR type policies.

Bosquet (2000: 20) confirms that reviews of studies show 'with various degrees of assuredness' that ETR can achieve 'both environmental and economic improvements'. He then expands the investigation by reporting on the results of 139 simulations from 56 studies. From this group, Bosquet (2000) again concludes that when environmental taxes are used to lower the costs of employing labour, significant reductions in pollution are achieved and there are small gains in employment. However, Bosquet (2000) cautions that no model is capable of predicting accurately the complexity and subtlety of a real world economy. He also notes that models do not take into account the 'dynamic effects' of ETR programs. These cannot be treated as insignificant as it is inevitable that businesses will adjust to new factor price conditions as new technologies emerge (something discussed further in section 4 of this paper). In 2002, Spangenberg *et al* (2002) ran several simulations using a new, large, input-output model of the German economy which, unusually, also captures energy flows, material consumption and land use. Again the conclusion of this study is that carefully orchestrated ETR type policies can be effective – at least in the short to medium term. Thereafter, economic growth tends to catch up with the resource efficiencies achieved by the conservation measures initially modelled, and higher taxes are needed to ensure successful environmental outcomes.

The Spangenberg *et al* (2002) study, and the related studies by the team of economists and physicists mentioned earlier (Kummel *et al* 2002; Kummel *et al* 2000; Hinterberger *et al* 2002; Spangenberg *et al* 2002), include some useful theorising as to a broad framework of quasi-quantitative macroeconomic conditions that are necessary if a set of environmental policies are to conserve natural resources whilst also avoiding unemployment in an economy. These are worth outlining here because they can be useful in gauging whether an economy is heading in the right direction ('they can be a compass' Spangenberg *et al* (2000:3)) and they also contain useful insights suggesting how social changes (such as reduced working hours) can reinforce the positive results. The theory centres on a 'minimum sustainability condition' derived, following Hinterberger (2002:119), where Y is output and R is natural resources, such that Y/R is output per unit of natural resource or, as we refer to it, the productivity of natural resources. For natural resources to be conserved, therefore, a percentage change in output must not exceed the percentage change in resource efficiency otherwise the

savings in resources will simply go to satisfy higher output. This condition is written in equation [1] as follows:

$$\Delta Y < \Delta(Y/R) \qquad [1]$$

Although it might be possible to achieve 'Factor Four' resource productivity (von Weizsäcker *et al* 1997) or even 'Factor Ten' (Hawken *et al* 1999), the laws of thermodynamics place a finite limit to the increase that can be achieved (Georgescu-Roegen 1971, 1976) and, clearly, this places limits on the increase in output, ΔY, if natural capital is to remain constant.

To bring employment into the equation, L is the total active labour force, so that Y/L is the output per unit of active labour, or the average production of labour. The average production of labour can be defined as the average output per working hour, Y/h, multiplied by the average working hours per person employed, h/L. Crucially, the number of people employed in an economy will only grow if the rate of increase in output, ΔY, is higher than the rate of increase in average production per person employed, $\Delta(Y/L)$. (So, for example, if the measure of average production turns out to have increased over a period of time, but the rate of increase of output has not matched this increase then it follows, *ceteris paribus*, that the number of workers must have declined, otherwise, when average production goes up, total production, $Y/L \times L$, must also go up. If it has not, there must be less L.) Therefore the condition for employment, L, to increase in an economy is:

$$\Delta Y > \Delta(Y/L) = \Delta(Y/h \times h/L) \qquad [2]$$

Combining the two relations, the necessary condition for conservation of natural resources, and the necessary condition for employment to increase is the *minimum condition for socio-environmental sustainability:*

$$\Delta(Y/L) < \Delta Y < \Delta(Y/R) \qquad [3]$$

The analysis is useful in indicating that these are the magnitudes that must be monitored to ensure that an economy is on a sustainable path, and on a path that does not also increase unemployment. It may be noted that, in the real world, substitution of new technologies which favour the employment of labour compared to existing technologies (e.g. renewables compared with fossil fuels) (Saddler *et al* 2004: 86), will decrease the average product of labour, Y/L (more people are employed at the same output), and therefore assist in meeting the minimum condition. Similarly, early retirement or reducing the number of hours worked in a week will reduce the number of hours worked *for any given L,* so that the average product of labour will fall, assisting further in meeting the minimum condition for socio-environmental sustainability.

This analysis would also appear to confirm that the social and cultural changes causing many people in developed countries to rethink their whole approach to work will assist sustainability. In an era of relative abundance, there is growing evidence that people are opting out the 'rat-race' fuelled by the 'consumer society' (what Hamilton 2003: 147-173 refers to as 'downshifting'), and opting for simpler, more fulfilling lives. Such a philosophy is highly congruent, of course, with the notion of a sustainable, just, and efficient economy.

EMPLOYMENT EFFECTS OF SUSTAINABLE DEVELOPMENT POLICIES AT THE FIRM LEVEL

Economic instruments such as cap and trade pollution permit schemes, carbon taxes, royalties, or quota controls on extraction of resources will all raise the costs of raw materials and energy used in business processes. Business managers will seek to lower costs by searching for efficiencies in the use of these resources. Some firms in the resource extraction sector, for example, if denied access to a resource may have to close down or significantly downsize operations. The same might be said of the fossil-fuelled energy sector. Meanwhile, other firms in the supply chain of affected firms will also face reduced demand for their services. Multiplier effects of these cutbacks can be particularly severe in certain communities where the local economy is highly dependent upon the industry that is being downsized. These communities are typically in rural areas where alternative forms of employment may be difficult to find and, in such cases, the only options for retrenched workers may be reskilling or relocation. Such a scenario, of course, is characteristic of the Tasmanian forestry example which inspired this paper, and this is an area where strategic initiatives at a macro level are so critical; a topic that we discuss in more detail in the next section.

In terms of the employment effects of sustainable development policies on business not directly connected with the resource extraction sector, a business strategy that seeks to economise on raw materials and energy inputs can generate cost savings, and to that extent, jobs can be retained or even increased. This does assume, of course, that businesses are currently quite profligate in their consumption of raw materials and energy, and not everyone is convinced that this is the case. Pearce (2003: 57-8), for example, expresses some scepticism about the 'win-win' arguments of those who argue that firms becoming environmentally responsible will also find it profitable to do so. He acknowledges that there will be a few simple things like energy savings, but does not believe there are 'substantial and pervasive' cost efficiencies to be realised, and thinks it unlikely that there is an 'entire managerial class unaware that it is losing money by not taking the environment or social concerns seriously' (Pearce 2003: 58).

Von Weizsäcker *et al* (1997), Hawken *et al* (1999), and WBCSD (2002), on the other hand, argue strongly to the contrary. These authors cite numerous instances where business in the private and public sectors could greatly increase both energy and material productivity, and profit by doing so. Examples proffered by von Weizsäcker *et al* (1997) include architectural designs which incorporate solar heating, natural ventilation and lighting and better insulation; the retrofitting of buildings to include these same architectural designs; super windows which lower air conditioning costs; lower energy consumption appliances; and many simple 'low-tech' suggestions like fatter and straighter pipes for industrial pumping systems (Hawken *et al* 1999: 117). Changing the funding arrangements of public gas, water and electricity utilities such that these bodies are rewarded for selling *less* of the resource instead of more, is another area detailed at length in von Weizsäcker *et al* (1997), and Hawken *et al* (1999).

All the technologies for the efficiency improvements described above are already in existence, which naturally begs the question as to why they have not been adopted on a wide scale. Possible explanations suggested by von Weizsäcker *et al* (1997: xxvi) include: transactions costs (obtaining the necessary information); discriminatory financial criteria (where renewable energy sources, for example, must

generate a return on investment in just a few years where public electricity utilities, on the other hand, are given a 10 to 20 year payback period); and social inertia or apathy (where householders, for example, may be disinclined to weatherproof their homes). The overriding reason for not proceeding with efficiency improvements, however, is that it simply does not pay in the short term. Virgin materials often have a cost advantage over recycled materials, while the regulations and incentive structures for production technologies or factory building design, for example, were devised at a time when material resources were abundant. Such price distortions would be removed, of course, with the introduction of ETR-type policies.

ETR policies notwithstanding, De Simone & Popoff (2000) point out, using examples of major companies, that firms' adoption of more environmentally benign ways of doing business has not only improved their natural resource productivity, but reduced their operating costs because of lower insurance premiums, and through preferential and cheaper access to capital. In some cases, market share has increased because of the improved company image among consumers. Arguing in a similar vein, Nieme & Hatfield (2000: 12) list cost savings amounting to many millions of dollars achieved by several major US firms adopting sustainable practices. Studies such as Nieme & Hatfield (2000) argue that these considerations are relevant to the employment effects of sustainable policies because, where cost savings are forthcoming, they increase the potential size of the wage fund and the capacity of firms to retain or even increase their employment of labour. If ETR policies recycle revenues in a way which lowers the cost of labour to employers even further, these incentives will obviously be stronger.

In addition to the debate about the adoption of known technologies, there is a growing literature on 'dynamic efficiencies' – the design and development of new technologies over a period of time prompted by the permanent change in relative prices which environmental policies bring about. Known in the literature as the 'Porter hypothesis' (Jackson 2000: 39), it is suggested that there are 'win-win' opportunities in this non-optimising world because regulation leads to 'innovation offsets'; that is, innovative ideas inspired by the desire to lower the costs of complying with new environmental regulations, which create new and cheaper ways of doing things. These innovations can 'not only lower the net cost of meeting environmental regulations, but lead to absolute advantages over firms in foreign countries not subject to similar regulations' (Porter & van der Linde 1995: 98, as cited in Jaffe *et al* 2003: 486). Much of the debate on this seems, again, to centre on the extent to which commentators accept the notion of a business world characterised by second-best conditions with imperfect knowledge. For those with neo-classical leanings, this is an intellectual stumbling block because the business world they conceive of is one characterised by profit-maximisers with few inefficiencies to start with. As the likes of Hawken *et al* (1999) have demonstrated, however, the scope for design efficiencies and the allied opportunities for profit are considerable. Moreover, environmental consciousness on the part of business entrepreneurs, while desirable, is not a necessary precondition.

Jaffe *et al* (2003: 506) draw two conclusions after considering the empirical evidence: first, that market based instruments for environmental protection provide better incentives than command-control approaches for 'the cost effective diffusion of desirable, environmentally-friendly technologies'; and second, that 'empirical studies suggest that the response of technological change to relevant price changes can be

surprisingly swift in terms of patenting activity and the introduction of new model offerings – of the order of five years or less'. These authors add the caveat that much wider diffusion of technologies can take longer depending on the rate of retirement of previously installed equipment, and that since there are many long-lived assets in an economy it is important to take a longer term view – decades – when aiming for improvements (Jaffe *et al* 2003: 506).

Both von Weizsäcker *et al* (1997) and Hawken *et al* (1999) urge businesses to rethink their current operations with a view to seeking natural resource efficiencies by designing products that are more durable, and then leasing these products, rather than selling outright. Hawken *et al* (1999: 139) give the now famous example of the company, Interface, which changed its business model from selling carpet to leasing floor-covering services, recognising that five billion pounds of carpet in landfill was 'throwing … energy and money into holes in the ground'. Moreover, replacing only worn carpet reduced carpet material required by about 80 per cent. Numerous other examples of the switch to leasing models are given in Hawken *et al* (1999) including Carrier, Electrolux, Xerox, and Dow Chemical Company. These authors envisage a future where companies wishing to sell rather than lease will be treated with suspicion as to what is wrong with the product.

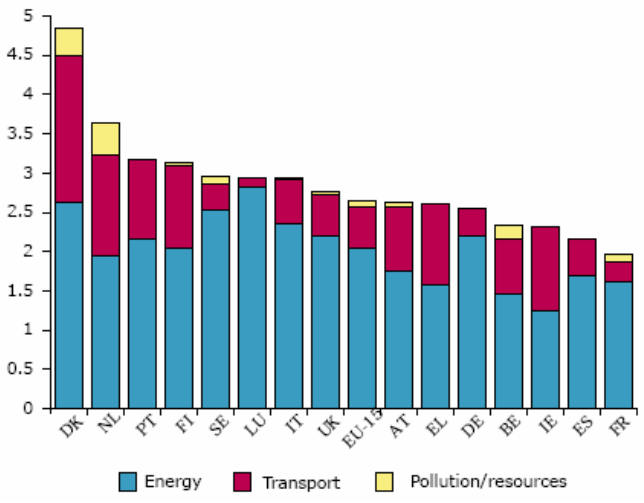
If incentives to conserve material and energy do change business models in this way, it is inevitable that employment in retailing of newly manufactured goods will decline, but this will be offset by the growth in employment of those involved in maintaining leasing agreements, repair, maintenance, customer advice and upgrading of products. Hawken *et al* (1999) predict that companies will compete to provide first rate services to their customers. One aspect of an increase in the 'service economy' is that the jobs of installation, maintenance, and upgrading must remain in the local economy; a factor to consider, perhaps, when contemplating policy to ameliorate structural unemployment arising from the downsizing of the Tasmanian timber industry, for example.

SUSTAINABLE DEVELOPMENT POLICIES AND STRUCTURAL ADJUSTMENT

There is little doubt that the Europeans lead the world when it comes to sustainable development policies. The Scandinavians, in particular, were among the first countries to experiment with ETR, Finland and Sweden commencing with their tax shifting in the early 1990s (Fischlowitz-Roberts 2002). Prior to enlargement in 2004, all European Union (EU) member states have embraced ETR to a greater or lesser extent. As Figure 1 illustrates, energy taxes figure prominently, accounting for more than three quarters of total tax revenue generated from environmental taxes within the EU-15.

Denmark and the Netherlands lead the way in the amount of taxes being shifted. Germany, meanwhile, is making a determined effort at ETR implementing it in several stages. Between 1999 and 2003, the federal government increased taxes on petrol, diesel and electricity, the revenues from which are returned to taxpayers almost in entirety in the form of gradual reductions and stabilisation of employer and employee contributions to pension funds.

Figure 1: Environmental tax revenues 2002 (% of GDP)



Source: Eurostat, 2004 (Adapted from EEA, 2005)

With such a high unemployment rate in Germany (and elsewhere in the EU), measures to reduce the cost of employing labour are obviously very welcome. To this end, a study conducted for the European Commission by Heady *et al* (2000), presenting a review of model calculations of the impact of a switch in taxes from labour to energy or carbon, concludes that almost all models show a positive impact on employment, albeit differing in size and impact. Such research findings are encouraging, but with unemployment levels hovering around 10 per cent, and tax shifting remaining quite small scale – accounting for little more than 5 per cent of total revenues from taxes and social contributions (EEA 2005: 40) – more incisive action may be warranted.

It may be pure coincidence that the two countries in the EU most committed to ETR – Denmark and the Netherlands – are those with the lowest unemployment rates. Other EU countries have implemented active labour market policies (ALMP) like they have, but what is significant is that both countries have taken steps to increase the flexibility of their labour markets without sacrificing social equity. Implementing structural reforms in the labour market will help to address the unemployment problem at one level, but the preparedness on the part of the governments in these two countries to reduce structural problems in the tax and benefit systems appears to be paying off. Well-targeted labour market reforms – including financial inducements for employers that hire long-term unemployed, and benefit sanctions for those reluctant to accept offers or training positions – ensure that disincentives to employ labour are reduced and job search behaviour is enhanced. Most importantly, the removal of structural rigidities in the labour market does not mean cutting of unemployment benefits, something atypical of labour market reform in other countries around the world. The significance of this point is that labour market reform has had broad political support, causing structural adjustment to be far less painful (Becker 2000; van Oorschot & Abrahamson 2003; Gaard & Kieler 2004).

Unemployment in Europe is a very complex matter that requires a range of policy instruments, and while there is clearly no ‘magic formula’, the notion of socially

inclusive structural adjustment should have great appeal. The standard response of orthodox economists is that such a strategy is quite fatuous because of the implications for the government budget. The fact remains, however, that this did not stop the Danish and Dutch governments from proceeding along these lines, and both started with sizeable budget deficits (OECD 2005). What makes socially inclusive structural adjustment doubly attractive, however, is that if ETR is the driver of the restructuring process, it can be revenue-neutral. The larger the amount of taxes shifted, the greater the scope for restructuring. So, in Germany, for example, where the labour market remains quite inflexible and unemployment stubbornly high, ETR has been further developed recently to focus on the removal of 'environmentally questionable tax reductions and subsidies' (EEA 2005: 41). If these savings can be redirected to finance a more radical labour market reform programme, this could be the element of dynamism required to bring down unemployment levels.

In summary, with careful planning, there is no reason why structural adjustment in an economy cannot be a wholly constructive process, so long as strategic intervention on the part of the state ensures that all the stakeholders are adequately compensated. There is little to be gained by following a 'scorched earth', Thatcherite-type policy towards structural adjustment such as that pursued by the British government in the 1980s. The mass closure of pits in concentrated areas brought about huge negative multiplier effects creating an industrial wasteland, huge social and political unrest, and a massive bill for state welfare; the latter being largely funded from the North Sea oil revenues. These funds might have been more effectively utilised had they been channelled into a programme that facilitated gradual closure of coal mines over a longer period of time while simultaneously seeding new industries to absorb rising surplus labour.

SUMMARY AND CONCLUSIONS

The analysis in this paper has made it plain that attempts to conserve natural resources will have unfavourable employment impacts not only for those immediately connected with the industry in question, but also for those indirectly affected as a result of the removal of price distortions that previously favoured the over-exploitation of natural resources. If, however, the maintenance of employment levels is a key element of ETR policies, then rising unemployment need not be a feature of natural capital conservation. Crucially, without such policies, it is highly unlikely that conservation efforts will win political and public support. Managing the transition to a more sustainable path for an economy represents a major challenge, but structural adjustment need not be as painful a process as that engineered in the UK by Margaret Thatcher during the 1980s. In keeping with policy design principle number (4), it is important to be mindful of historical context and to proceed gradually.

It follows from this that the pursuit of strong sustainability as an objective, must involve forethought as to how to proceed in stages over the long term, keeping in mind the flexibility, adaptability and micro-variability of design principles (2) (3) and (5). Hamilton & Denniss (2005) suggest that a pragmatic, politically astute approach to developing environmental policy would be to follow the model which the Australian government has used since the early 1990s to introduce policies to eliminate uncompetitive practices across all sectors of the national economy – commonly known

as National Competition Policy (NCP). In addition to staging the process sequentially, new agencies were created for the development and implementation of the policy, and a system of financial rewards and penalties was designed in order to entice state and local governments to cooperate. Hamilton and Denniss (2005: 50) conclude that:

> 'National Competition Policy has succeeded, on its own terms, despite the trenchant opposition of large numbers of voters, workers, unions, companies and State Governments. It did so, in part by identifying winners and losers, harnessing the support of the likely winners and compensating the most politically difficult opponents.'

The forethought required for environmental policies, it must be said, appeared to be notably absent in the apparent 'knee-jerk' reactions of both of the major political parties during the 2004 federal election campaign in Australia. It also appears to be absent in the current Australian government's environmental policies which, whilst concerted at both state and federal levels in some areas (e.g. water), nevertheless appear to be reactions 'where the noise is loudest' rather than being part of a pre-announced, well advertised, thoroughly explained, and comprehensive ETR type strategy.

Such a strategy would aim at a macroeconomic target to maintain employment overall, but for those who do become unemployed during the restructuring of the economy, generous welfare assistance to those affected is vital as is the financing of well-targeted labour market programmes that facilitate transition back into waged employment or some alternative socially-fulfilling enterprise. In the Australian context, after 14 consecutive years of economic growth, and at a time of historically low unemployment, it is supremely placed to pursue a radical, socially inclusive structural adjustment programme, supplementing the funds generated by ETR from the current fiscal surpluses. Such a scenario is one many of the European countries could only dream of.

Ultimately, it is not a case of *whether* policies to protect the environment will proceed, but *when*. The choice is between accommodating change now with carefully considered and strategically implemented policies that produce sustainable scale in a just and efficient way, or adopting a *laissez-faire* approach where the prospect of minimising environmental, economic and social disruption in the future is much lower. If the Australian government elects to take the latter course then, sadly, those connected with the Tasmanian logging industry will continue to be political pawns until the game is played out and they are cut adrift – Thatcherite-style – to fend for themselves.

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