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What Is so Sustainable about Services?

The Truth in Service and Flow

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Over the last 15 or so years, many have argued for a shift from products to services on the grounds that a service economy would be significantly more sustainable than our current product-ownership oriented one. But amongst those who have sought to elaborate and operationalise the idea, awareness is growing that there is something wrong with it. This paper contrasts the original, commonsense reasoning which makes the idea of a service economy seem plausible in the first place with the way it has typically been elaborated in the literature. This brings out what is wrong – in the move from bright idea almost anyone could have to an elaborate set of strategies for 'dematerialisation', the original, commonsense understanding of the end user is tacitly supplanted by a leaner and meaner conception of human rationality deriving from neo-classical economics, decision theory and the like. The shift to service is now seen as a business model which seeks to deliver the very same ends in 'smarter' (significantly more sustainable) ways. But this only externalises something internal to

the original idea: the political character of the shift, in which users and consumers re-configure their preferences and expectations to accommodate the fact that service purchase could never ensure the same kind of 'convenience' as product purchase. The problem of re-jigging expectations and preferences – of self-transformation – then reasserts itself from outside, as a threat to the *economic* sustainability of services.

The conception of human rationality implicit in the original commonsense idea is contrasted with the leaner one imposed on it by many of its proponents and much of the literature. In conclusion, a further sense in which service and flow might contribute to sustainability is identified – one which transcends the idea of 'dematerialisation' but remains invisible if one thinks of the shift to services not as a political transformation of society and self, but as the implementation of a clever business model.

In their influential book *Natural Capitalism: The Next Industrial Revolution* Hawken, Lovins and Lovins call for "a fundamental change in the relationship between producer and consumer, a shift from an economy of goods and purchases to one of *service and flow*." According to them, an economy based on service delivery rather than product ownership "can better protect the ecosystem services upon which it depends."[1] The basic idea is simple: people typically want only the services provided by products, not the products themselves. They typically want photocopies, not photocopiers, access to diverse places, not cars, clean clothes, not washing machines, sawn logs, not chainsaws, and so on. So people could have the things they want if they simply bought the services when they needed them rather than buying the material things which provide the service. If, however, the economy were arranged around service provision, then the same material things could have multiple users, could be more durable and could be better maintained since the service provider would have an interest in a longer rather than a shorter product life, and so on. A service economy would reduce the materials and energy intensity of economic activity. To use the jargon of the literature, it would 'dematerialise' this activity.

Over the last fifteen years the thought that significant improvement in sustainability could be achieved through 'dematerialisation' has generated a flurry of activity and acronyms. The European Union, for example, has sought to operationalise the idea by developing so-called function-oriented business models or product-service systems (PSS). A product-service system is defined as some mix of tangible products and intangible services designed to shift some aspect or degree of end use purchase from product to service. Since not all forms of production and consumption can be as shifted as radically from products to services as others, there are several forms of product-service system. Thus, Arnold Tukker, whose critical evaluation of product-service systems we shall be looking at

more closely, distinguishes eight types, ordered according to how much of end use purchase each shift from product to service. Even so, a central motivation for all forms of product-service system is the conviction that the production and consumption of services is inherently more sustainable than the production and consumption of products. Clearly, if this conviction is right, and if production and consumption can be reorganised along services lines while remaining economically viable, an economy based on services will provide greater *economic* incentive to engage in more sustainable behaviour than one based on product sale and ownership.[2]

It is not obvious, however, that this conviction is correct. In its Fifth Framework Programme the EU set out to explore the presumed benefits of product-service systems, partly by setting up the Sustainable Product Network Development Network (SusProNet).[3] This network of academics, business representatives and other professionals was charged with investigating ways of realising the potential assumed to be inherent in product-service systems for designing economically viable systems with "factor 4–10 sustainability improvements."[4] Unfortunately, SusProNet has not been able to confirm that product-service systems could ever synthesise economic and ecological sustainability. Others have endorsed this kind of conclusion, arguing that a re-orientation away from products to services achieves no significant improvements.[5] Others again have asserted something stronger: in some cases, the shift from products to services only makes for greater unsustainability.[6] In short, while many forms of product-service system can be shown to have *some* potential for improving sustainability, "it has also become clear that the PSS in general is not a panacea for reaching radical factor 4 or 10 environmental improvements."[7]

In a way, this is not surprising. Firstly, when the service idea first occurs to one, it typically does so with regard to such readily visible products as domestic hand power tools. With regard to many such items, e.g. electric drills and the like, the significant environmental burden is presumably located in manufacture and disposal rather than use. Yet this need not be the case. It is at least possible, indeed in the case of things like aeroplanes highly likely, that the significant environmental burden will lie in the operation of the product. The mere possibility of this suffices to show that one cannot move automatically from the easy case of power tools to the general claim that a service economy will be significantly more sustainable than one based on product ownership.

Secondly, the gains in sustainability brought about by the lesser number of better made and better maintained things could well be offset by things people have to do in order to access when needed or desired the service provided by these things, e.g., getting the power tools from the hire firm and then back, getting all the other materials needed in order to use the power tools, and so on. After

all, if power tools are not generally owned individually, then various other items associated with their use – drill bits, power leads, clamps, work benches, vices and many other things – will surely also not be owned individually. This will certainly tend to become true the more the idea of service and flow catches on. What one argues for power tools, one could argue for glue: surely it would be better to hire a robust glue dispenser, paying only for the glue actually used, rather than buying all those tubes which end their days half used as shrivelled lumps in the tool box.

This second consideration points to one very obvious reason why people like to own items of capital equipment even though such ownership means massive under-utilisation: the sheer convenience. To this extent, it is just not true that a car which stands for 85% of its life in the driveway is not delivering the intended service. It is delivering a service, indeed, precisely the service its owner paid all that money for: it is standing there, conveniently available anytime its owner wants it. Here we see the need to distinguish carefully between provision of service and use. Something can still be delivering a service quite effectively even if it is not actually being used. The *service* provided by something includes its *accessibility* to a potential user, that is, its being so positioned in a user's life that this latter is able to use it in an effective and timely manner.

Because product ownership accomplishes this positioning very well, it is in one way quite wrong to describe it as 'inefficient' or 'wasteful'. To appreciate this point, however, is to recognise that in many cases a service system which genuinely replicated the service provision of product ownership would inevitably approximate to, perhaps even exceed, the unsustainability of the latter. Imagine, for example, what it would take to ensure that a hire car was as readily available as the car one owns. It is in fact highly unlikely that the intensity of providing services directly would differ significantly from that of providing them through product ownership *if direct sale of service sought to replicate delivery of service through product sale*.

At the very least, then, an unqualified enthusiasm for service and flow is misplaced. Yet it would be wrong to take the considerations just advanced as a reason for rejecting the whole idea. Even if these considerations show that one cannot naively assert that a service economy is more sustainable than a product-oriented one, still there is something very plausible about the idea. Something must be right about it. We do well, therefore, to explore it a little in order to determine what initially made it so compelling.

This, then, is what I propose to do: first, in § 1, I will go back to the kind of everyday reasoning which first generates the thought that a shift from products to services would bring significant gains in sustainability. I want to identify just what people are envisaging, or at least what they are allowing for, when, in everyday, non-theoretical contexts – down the pub, in the student union, etc.

– they reflect upon current economic life and conclude that if it were organised along service lines, its environmentally destructive aspects would be significantly ameliorated. In particular, I wish to identify how such everyday reasoning tacitly understands the shift to service it recommends.

I will then contrast this with how proponents of dematerialisation and much of the literature construes service and flow. I take Tukker as my representative case precisely because his conclusions about dematerialisation are negative. I shall argue that these negative results have very much to do with how he understands strategies of dematerialisation through services. For he, like many proponents of service and flow, as well as much of the literature, takes what Heiskanen *et al.* call, perhaps unfairly, "an engineering and mainstream economic approach."[8]

This contrast between initial bright idea which someone on the street might have and the theoretical elaboration thereof will bring out a significant difference between the original pre-theoretical kind of reasoning in which the initial plausibility of service and flow emerges and the way it is conceived by its proponents and in the literature. In particular, it will show that something crucial to understanding the plausibility of service and flow gets lost in translation from the pre-theoretical to the theoretical.

Then, in § 2, I will show that this loss arises because in the move from the everyday argument to theoretical elaboration the rich conception of human rationality implicit in everyday reasoning has been displaced by a considerably leaner and meaner one. These two competing conceptions of human subjectivity and rationality are then compared and contrasted in order to reveal their consequences: on the one hand, a rich, decidedly political conception of the shift from products to services which readily explains why one should regard such a shift as yielding significant gains in sustainability; and on the other, a conception of the shift as a business model with no capacity to bring out what is right in the idea of service and flow. Finally, in § 3, I will argue that when one thinks of the transition from products to services as the implementation of a business model, one misses a sense in which the shift to services might enhance sustainability that goes beyond mere dematerialisation.

§ 1: Back to Gut Intuitions

What exactly is one committing oneself to when, having observed that items such as power tools do not really get used that much at all,[9] one declares, in everyday fashion, "It would be far less wasteful and less environmentally destructive if instead of many individuals having access to many under-utilised power tools through individual ownership of them, access were provided to considerably fewer, better utilised tools through some kind of service system, e.g., a power tool rental service or even a neighbourhood power tool

co-operative." One thing one is definitely *not* committing oneself to: that this service solution is simply a matter of optimising means to the very same ends. That is, in declaring commitment to a power tool service system, one is *not* necessarily committing oneself to the claim that this system will replicate *without remainder* what is accomplished by the current system of product ownership.

One is therefore leaving conceptual room for the possibility that the transition from products to services involves some not too drastic loss of serviceability, in particular, with regard to convenience. And when this is pointed out, one will not necessarily back away from the idea, as if the idea had been shown to be economically unviable, hence impossible. One will acknowledge that – since a service system which literally replicated the level of convenience enabled by product ownership would also replicate the latter's unsustainability – the emergence of the service system presupposes some modification of user expectations downwards – not too intolerable a modification, of course, but nonetheless some.

That some such modification will be required is, of course, also acknowledged in the literature. Of particular interest is, however, just how it is acknowledged. Tukker points out that of the eight basic types of product-service system he distinguishes only those with a high service-sale component will achieve significant gains in sustainability. The power tool service system which almost anyone might propose as a sustainable solution to current power tool use is one such kind. More precisely, it embodies a type of product-service system which falls right in the middle of Tukker's scale, precisely that type which

> in general demands tangible sacrifice by the user. He/she now has to put time and effort into getting access to the material artefact.[10]

Importantly, for Tukker, this fact constitutes a serious and above all an *external* problem. In other words, resolution of it is not conceived as part and parcel of the implementation of the product-service system itself. Consistent with this, Tukker concludes that the demand for tangible sacrifice undermines the competitiveness of this type of product-service system, and thus its viability as a means of achieving better efficiency and sustainability (since these gains will not be realised if the system cannot survive the pressures of economic competition long enough to realise them).

But the demand for sacrifice is *not* a problem, at least not in the same way, for the kind of everyday reasoning described above. When in everyday fashion we judge existing practices of production and consumption to be irrational and unsustainable, we are making an *ethical* judgement. The problem we see in them is

not that they fail to satisfy individual preferences, but that they do so at too high an *ethical* cost: they damage things which deserve our care for the sake of furthering goals which are comparatively insignificant by contrast. Furthermore, a distinctive feature of the kind of reasoning indicated is that when we engage in it, we are not behaving like anthropologists observing an alien culture. The practices of product-oriented production and consumption we describe as 'irrational' and in particular 'unsustainable' are our own. So we are tacitly assuming that the end users engaged in the practices we are criticising are in a position to understand and evaluate our *ethical* criticisms of these practices. We can, however, only rationally make this assumption if in addition we regard ourselves as having reasons for these criticisms good enough to win recognition from these users that these criticisms are correct.

If, however, this is so, then, when we propose that these practices be shifted from a product- to service orientation, we are implicitly understanding this shift to have built into it, as integral part, precisely recognition of the validity of this ethical critique and, in addition, genuine acceptance of the need for what Tukker calls sacrifice. From the outset, we tacitly embed, as part of the shift itself, recognition that in order to realise the ethically motivated goals driving it, 'servicisation' will not necessarily replicate the original levels of convenient availability enabled by product ownership. Moreover, since we conceive the shift as culminating in self-reproducing behavioural practice, we are not envisaging the 'sacrifice' involved as an uncompensated-for loss. Rather, we are imagining the shift as taking place in such a way, under such conditions, that loss is overcome, through *compensation*, as when it is cancelled out, or at least suspended in its painfulness, by the realisation or enhancement of other goods;[11] through *transformation*, as when, through re-definition of what one wants, it ceases to be a loss; or indeed through both compensation and transformation alike.

So from the outset we are assuming the shift from product to service to constitute much more than the introduction of a business model. In the first instance, we understand it to take place against the background of a socio-political process of re-casting and re-ordering notions of legitimate and illegitimate, worthy and unworthy desire in order to create that kind of *ethos*, that understanding of living well,[12] which is required for the *economic* sustainability of the putatively more ecologically sustainable service model. In the second instance, we are assuming that the end users and consumers for whom we are recommending the 'servicisation' of their practices are capable of participating in such a process of transforming existing conceptions of living well into ones more compatible with the envisaged service model. That is, we are assuming them to be capable of evaluating much more than the mere efficacy of means to pre-given ends; we are taking them to be capable of reflecting upon their situation and life-experience

in such a way that their preferences, hence dispositions to behave, fit better with the requirements of ethics. One might say that we are taking them to be capable not just of optimising means to ends, but of optimising ends themselves. From the outset, then, we are assuming that the shift from product to service to involve an ethically motivated search for a way of living tolerably with a reduced level of convenience. So for the kind of commonsense reasoning which gives the idea of shifting from products to services its initial plausibility there is no *outstanding* problem of sacrifice because the problem *does not stand outside*. Rather, recognition of the problem and its solution is understood to be internal to the transition.

At this point, we see *why* Tukker and other proponents of service and flow typically characterise the problem of sacrifice as outstanding, that is, why they do not see the demand for sacrifice and its fulfilment as internal to the transition. They conceive our power tool service system simply as a way of doing smarter *the very same things we have always done*; the transition from products to services is seen simply as a matter of optimising means to the *same*, pre-given ends. Re-working of these ends is thus conceptually excluded from the transition. Proponents of service and flow, say Heiskanen *et al*.,

> have assembled much evidence that *current* levels of well-being [note this: *current* levels] could be achieved with radically lower natural resource use. To put it bluntly, they see dematerialization as an *optimization problem*, which can be solved through systems design and the right incentives.[13]

But this is not how dematerialisation is understood initially, in the commonsense way which accounts for its initial plausibility. For the kind of everyday reasoning illustrated above, the transition from products to services is not *defined* as a matter of achieving the *very same* levels of well-being by alternative, less materially and energy intensive means.[14] From the outset, it is implicitly allowing that the transition also implicates what was called above the optimisation of ends. That is, the transition is understood to be embedded in a process whereby individuals induce, in the light of the empirical, in particular, the environmental realities, a better balance between preferences and ethics, in other words, a new understanding and way of living well. Consequently, the problem of sacrifice is not a threat to the economic viability of more radically service-oriented, hence significantly more sustainable kinds of product-service system since it is assumed to have been recognised and dealt with in the transition to them.[15]

§ 2: Competing Conceptions of the Human Subject

What explains these different ways of understanding the demand for sacrifice – as on the one hand *internal* to the shift to services, on

the other, *external* to it? At issue here are two different conceptions of the end user. More accurately, two different conceptions of us human subjects are at work here, whether we be producer or consumer. Both conceptions are primarily *normative* ones: they do not primarily depict human beings as they actually are, but rather as they are ideally – which is not to say that they do not have empirical consequences for actual humans, consequences against which one can therefore test them. Nonetheless, they are primarily normative in the sense that they constitute conceptions of what it is to be a *rational* or *reasonable* human being and obviously not all *actual* human beings are rational all of the time.

The first conception of human rationality is the one implicit in everyday, commonsense reasoning of the kind illustrated. On this conception it is constitutive of being a rational or reasonable human subject that one be able to re-jig, in the light of experience, individual preferences in accordance with ethical considerations – in effect, to recast aspects of oneself across time. So, in this conception, rationality does not exhaust itself in the calculation of effective means to pre-given ends. While rationality in the end-means sense must be a part of the story, it is only ever a proper part. For on this conception of it, rationality *irreducibly* implicates deliberation about where one's *legitimate* or *worthy* preferences begin and end, given the ethical status of other persons and things. In other words, an *ethical* orientation is a *primitive constituent* of the notion of rationality; it cannot be analysed away in the manner of much decision theory and standard economic theory, which can only accommodate it by construing the notions of preference, desire or end so broadly that the right and the good can be objects of desire or preference. The capacity to determine which preferences, desires or ends *ought* or *deserve* to be realised in the circumstances is co-ordinate with the capacity to determine which ones *can* be realised, hence cannot be subsumed under it.

Now since rational deliberation must be capable, at least ideally, of guiding action, it follows that to construe rationality as irreducibly oriented towards the ethical is to construe any rational agent as irreducibly oriented towards that ideal situation in which the ends which *can* be realised are ones which *ought* or *deserve* to be realised (and *vice versa*). Clearly, there are two dimensions along which the *real* situation of any *real* (more or less) rational agent might be brought into closer alignment with this ideal situation: on the one hand, external circumstance might be modified in order to engender closer alignment, on the other, internal circumstance, i.e., the ethical commitments and prudential interests of rational agents themselves, might be modified. Thus, embedded in the conception of rationality tacitly appealed to in commonsense, pre-theoretical argument for a shift from product to service, is the idea that rational agents can, through reflection on their situation and their life-experience, re-order and re-cast the constellation of their norms,

values and interests in such a way that these latter cohere better with one another. In other words, implicit in the pre-theoretical, everyday understanding of the shift to service is the idea that rational agents are capable of a process of re-casting themselves *and simultaneously their external situation*, thereby coming to a *better* understanding to what it is to live well and indeed a *better*[16] way of living well.[17] Note that for strictly conceptual reasons this process encompasses both external socio-economic reality and internal, psychological reality, as two inseparable, co-evolving aspects or moments, since re-alignment of the one aspect enables and reinforces re-alignment of the other.

The second conception has its roots in the political philosophy of early modernity, the period from Descartes to Kant.[18] It is implicit in neo-classical economics and the various forms of decision theory, however they may conceive rationality more precisely. In the literature on how to shift human behaviour in more sustainable directions, it is known as the 'rational man' conception of decision-making and action.[19] It consists in identifying rationality with the calculation of effective means to pre-given ends, and so cannot really find a place for that re-alignment of norms, values and desire which, in everyday, pre-theoretical contexts, we are typically happy to acknowledge. And so, like Tukker, it ignores it. In the words of Dawnay and Shah, this conception

> stops short of trying to explain where people's preferences come from, so it does not take account of the direct influence of other people's behaviour and social norms. People's preferences are exogenous to the … model (i.e. they are taken as given and are outside of the model). The theory assumes we independently know what we want and that our preferences are fixed. This standard theory is very good at explaining short-term decision-making (I want a green vegetable and choose beans as they are on special offer) but cannot explain longer-term changes in preferences (I now only choose organic food).[20]

This second conception of human rationality displays an important feature: for it, internal consistency is the only standard by which preferences can be judged to be held rationally or irrationally. Individual preferences themselves are not subject to such assessment. To paraphrase David Hume (1711–1776), it is no more irrational to prefer the destruction of the whole world than the scratching of one's little finger. Consequently, this conception must deny what, pre-theoretically at least, we are inclined to assert: that the process whereby sets of individual preferences change over time is a rational process in the sense that it is a matter of learning or growth. Naturally, preferences change over time but one can only give a psychological, sociological or perhaps

neuro-chemical explanation of this – as, for example, when one says that the reason why someone had become intensely religious was that LSD had altered the production of chemicals in their brain. The same applies at the larger, social level: radical social change, in which qualitatively new societies arise with qualitatively new kinds of individual preference, cannot be conceived of as rational, as a process of social learning and ethical improvement. In this sense, then, for this conception of rationality there is no truly *radical* politics in the way there is for the first.[21]

These differences underpin and explain the different ways in which the shift to services is a problem, on the one hand, for the kind of everyday reasoning illustrated above and, on the other, for thinkers like Tukker. Because it works from the first conception of human rationality, everyday reasoning can understand this transition as a seriously political one in which end users and consumers recast their individual preferences. So it can understand the recognition of what Tukker misleadingly calls sacrifice as integrated into the transition itself – not, however, as something one just has to grit one's teeth and accept but as a problem to be overcome in the course of the transition itself, through compensation or transformation of the kind intimated above. Precisely for this reason, everyday reasoning can understand the transition as political in a sense richer than the parliamentary, that is, as more than a matter of politicians working with public servants to devise regulatory frameworks whose carrots and sticks will re-direct behaviour in some desired direction.

The kind of commonsense reasoning which accounts for why we find the idea of service and flow plausible in the first place is thus implicitly committed to a conception of politics which does *not* see it solely as a matter of "systems design and the right incentives."[22] Politics in the parliamentary sense of designing appropriate regulatory frameworks, with their associated carrots and sticks, obviously has an important part to play. But it is only a proper part in the whole story. That this is so is shown by what may be reasonably expected from the carrots and sticks through which a regulatory regime takes effect. As a rule, these could never *create* a self-reproducing behavioural practice with some radically new virtue, such as improved sustainability. For by creating the 'right' regulatory framework, with the right mix of carrots and sticks one cannot as a rule hope to create those 'normal' behavioural dispositions and expectations which, *precisely because they are normal, do not need carrots and sticks* to sustain the practice in the first place.[23] Carrots and sticks can, of course, shift an existing behavioural practice in some preferred direction, but they rarely do so *radically*, that is, transform an existing practice into a new one.[24] 'Normal' behavioural dispositions, expectations and the norms, values and interests which underlie them invariably set limits to what carrots and sticks can accomplish by way of behavioural modification.

In consequence, carrots and sticks find themselves subject to a law of diminishing return, the further they attempt to wrest behaviour away from what is currently normal. For this reason, the further away from the norm they attempt to wrest behaviour, the more tempting or threatening they must be made, which in turn undermines their economic viability. As a result of these kind of *systemic* contraints, the behavioural improvement curve behaviour which tracks the impact of carrots and sticks – standard techniques of demand management, for example – tends to level out at a comparatively early point. In response to an extraordinarily severe drought, the regional city of Goulburn in south-west New South Wales, Australia, has been able to reduce daily water consumption from fourteen to five megalitres per day through standard techniques of demand management (for which they had secured widespread community support through education). In a recent radio interview, however, the Mayor of Goulburn reported that as significant as this accomplishment was, it might not be enough – yet current strategies seemed to be levelling out at the insufficient level just indicated. The fact that carrots and sticks are subject to a law of diminishing return suggests that regulatory and institutional design alone cannot bring a new, self-reproducing behavioural practice about. While often necessary, it is rarely ever sufficient. Rather, it must be embedded in a wider, extra-parliamentary political process of developing that *new alignment of norms, values and interests* which define a new, self-reproducing behavioural practice.

So on this conception of the shift to services, the transition is a decidedly political process of learning and experiment in which users, producers and consumers engage in a process of reflection and negotiation *in which precisely notions of convenience are up for grabs, i.e., for potential sacrifice*. Insofar as they believe that a service system which sought to replicate the convenience of product ownership would fail to achieve sufficient improvements in sustainability, any service system they devise as an answer will not be promoted as a clever way of doing more sustainably the very same things they had previously done. Rather, the service system will emerge as an attempt to engender a more realistic conception of convenience, given the environmental realities. Yet provided the system devised is not gratuitously inconvenient, and in particular, provided the context into which it is to be inserted is so adapted that one can use the system without encountering inconvenience elsewhere, people will not initially experience the loss of convenience as intolerable. Judgements of convenience and inconvenience, at least for moderately rational, moderately mature individuals, always fall within the bounds of what is realistic since a 'convenience' which does not fall within these bounds is in fact mere wishful thinking – like the 'convenience' of being able to move from place to place via the transportation device on the star ship Enterprise. What, however, is 'realistic' is determined

in part by a culturally conditioned and historically evolving social consensus as to what is ethically permissible and empirically possible.

Once moderately rational, moderately mature individuals have determined where the level of *realistic* convenience lies, they can then begin to learn to live without so much as the thought that having such and such at one's finger tips, instantly available for use, is indispensable for living well. At this point, notions of convenience and inconvenience have been revised to accommodate the ethical and empirical facts. At this point, too, talk of the need for sacrifice, *indeed of trade-off*, shows itself to be a misdescription born of that diffidence towards users and consumers to which one is inclined by the construal of service and flow as a mere business model. In fact, there is, in this process, no sacrifice or trade-off in any meaningful sense, but simply the initial response and subsequent learning-to-live-without of a moderately rational, mature human being. Of course, the unspoken premise in all this is that the required social consensus as to the ethically permissible and empirically possible is in place or is at least evolving. But just this political evolution is the transition from the product to the service.

Note now that when one works with the second conception of rationality, the situation looks quite different. In this conception the transition is precisely as Tukker implicitly conceives it to be, namely, the introduction of a particular kind or kinds of business model. So the process in which users and consumers re-jig their individual preferences to fit the changed environmental circumstances is not itself part of the transition from products to services. This issue therefore remains unaddressed and now appears precisely as an *external* problem to which the transition itself provides no answer. Furthermore, the second conception of rationality lacks the conceptual resources for providing a solution to it – except, of course to recommend that government step in to create a regulatory framework which constrains users and consumers to act *as if* they had re-aligned norms, values and desire.

But with this, the initial plausibility of service and flow as a means of securing significant improvements in sustainability evaporates. We now see why: the originally rich conception of human rationality which underpins this plausibility has been supplanted by the leaner and meaner one, and so, under the hand, the transition from products to services has been robbed of its initially rich, political character as a process in which a new form of life, with revised conceptions of convenience and inconvenience, emerges. We are left with a business strategy, a mere variation on a theme of business as usual, which we then discover not genuinely to resolve the conflict between economic and environmental sustainability.

§ 3: Beyond Dematerialisation

The problem with thinking of service and flow merely as a business strategy, that is, a way of doing sustainably the very same things we have thus far done unsustainably, is not just that we lose sight of what makes dematerialisation a strategy for sustainability in the first place. When we think of the shift to services in this way, we also tacitly buy into a rather truncated conception of the *causes* of unsustainability. This leads in turn to a failure to see all that is needed for achieving greater sustainability and, at the same time, to a failure to see all the ways in which a shift to services might, in significantly many cases at least, enhance sustainability. To put the matter a little crudely, we fail to see that such a shift offers more than mere dematerialisation.

A service economy which attempted to replicate to any significant degree the convenience of product sale would not, I have argued, be significantly more sustainable than a product-oriented one. In fact, it might even be more unsustainable. The problem here is that services are not as neatly packageable, hence saleable as products. This is true even in the comparatively straightforward case of power tool use: buying the service of a power tool rather than the power tool itself requires far greater coordination between producer, distributor and consumer. One has to go down to the power tool hire store or co-operative in order to get it, one has to fill out various forms and undertake various legal commitments, one has to return it by a certain fixed date – all assuming that the store or co-operative has the tool needed when it is needed in the first place.[25] Given the sheer number of explicit coordinations required, it is not surprising that many service systems would probably be more unsustainable than their traditional product-oriented competitors *if* they attempted significantly to reduce the number of, or obviate the need for, such coordinations.

The need for this kind of explicit coordination is particularly evident in Tukker's eighth and most radical form of product-service system. In this form, which Tukker calls functional result PSS and rightly describes as the one with "the highest potential for [environmental] impact reduction,"[26]

> the provider agrees with the client the delivery of a result. This category is used in this article, in contrast to activity management/outsourcing, for a functional result in rather abstract terms, which is not directly related to a specific technological system. The provider is, in principle, completely free as to how to deliver the result. Typical examples of this form of PSS are companies who offer to deliver a specified 'pleasant climate' in offices rather than gas or cooling equipment, or companies who promise farmers a maximum harvest loss rather than selling pesticides.[27]

Clearly, this would require that the company selling the service of preventing a harvest loss greater than such and such a percent be right down there on the farm. In effect, the company would have to be continuously present as a co-farmer, which would require ongoing interaction and coordination of activity with the original farmer over a considerable period of time. In fact, it would probably make sense for the company to move in permanently, at least if it had delivered on its initial contracts. Note that it is precisely this kind of product-service system, in the shape of Ray Anderson and Interface, Inc., which lies at the heart of the natural capitalist argument for service and flow.[28]

The lesson is clear: market forces cannot lubricate a service economy as effectively as they can a product-oriented one. Or, to put the same point another way, services are not as good commodities[29] in the Marxist sense as products are; they resist commodification to a greater degree, hence cannot appear as readily on the market as bearers of homogenous, quantifiable exchange value. In order thus to appear, they require more help from a decidedly visible hand.

This has some important consequences. The transition from products to services, at least when understood in the everyday, commonsense way with which I began, and not simply as optimising means to the very same ends, is no doubt part and parcel of the shift to a more sustainable society. We now see, however, that it involves considerable external intervention in the play of market forces. Part of this intervention would obviously come from the state, which would have to be involved in a significant regulatory exercise. More importantly, however, it would have to come from individual producers and consumers, and groups thereof, themselves. The whole economic interaction between producer and consumer would have to be interwoven with a legal, social and ethical interaction to a much greater degree than in a more traditional product-ownership oriented economy.

Now assuming that this is possible at all, that it would not become grossly complex, there is potentially something very sustainable about it, something which, however, goes beyond mere considerations of materials and energy intensity. For it would require economic interactions to be considerably more transparent and considerably slower, and just this, is, from the point of view of sustainability, a good thing. I often decide to go shopping by car because I invariably have some paper to write or a lecture to prepare, thus cannot afford the extra one and half hours which using public transport would cost me. I illustrate the classic contradiction between short term and long term rationality which is surely a principal obstacle to overcoming current unsustainabilities. And the cause of this contradiction is that I have so much on. Clearly, I need to be able to reduce my time poverty, to slow down, so

that pressures of time do not squeeze out the possibility of making more sustainable decisions.

More generally, we need to slow the economy down if we are to preserve or regain the kind of steerability which would reduce conflict between the short term and long term. Arguably, a service economy would have many more brakes inherently built into it – hopefully not too many, of course. If it does, then this would constitute a new dimension at which a service economy would be more sustainable than our current product-based one. Crucially, in order to see this, one must think of the transition to such an economy in the genuinely political way in which pre-theoretical commonsense comes to the idea. One will never see this if one thinks of service and flow as just being cleverer at what we have always done.

§ 4: Concluding Clarifications

This paper has not argued that a product-service system established simply as an alternative way of conducting business-as-usual could never achieve what must be regarded, at least when considered in isolation from effects elsewhere, as significant gains in sustainability. The point has rather been to suggest that this is not *reliably* the case, as a *general rule*. But this much alone suffices to make it legitimate to ask whether recent enthusiasm for product-service systems is justified. This enthusiasm has, after all, been driven by the conviction that 'servicisation' constitutes a *strategy*, hence a *general rule*, for achieving sustainability.

The claim that product-service systems, when understood simply as new business models for doing the very same things, are not inherently more sustainable than anything else has been derived in a two-fold manner: on the one hand, through conceptual, even phenomenological reflection on what makes the general idea of service and flow plausible in the first place; and on the other, from conceptual analysis of the lessons drawn by one significant proponent of the idea from his own reflection on the history of PSS research. In addition, the paper has insinuated that this conclusion can be further confirmed by extending the kind of analysis undertaken here to the kind of empirical work done by Meijkamp.[30] This extension is, of course, yet to be undertaken.

But this negative conclusion is not the only result of the paper. There is something right about the general idea of service and flow, something which, however, gets lost in the transition from initial idea to organised, large-scale research programme. What is initially right about the initial idea is the initially rich, political understanding of what the shift to service is. Initially, the shift is tacitly understood as embedded in a political process which is not simply parliamentary, a process which consists in users, producers and consumers simultaneously re-casting both their understandings and their practices of living well. Precisely for this

reason, the general idea presupposes a more-than-instrumental conception of the rationality of users, producers and consumers. For this reason, too, it is able to construe the shift to service as a transition in which users, producers and consumers learn how to re-jig their expectations of convenience downwards, thereby enabling the *significant* gains in sustainability expected.

This rich, political understanding has, however, got lost in the transition from initial idea to systematic theoretical exploration thereof. In this transition, the idea is seized upon as something which will permit us to do *the very same things* in radically sustainable ways. This then pushes aside the initial rich, more-than-instrumental conception of rationality in favour of an instrumental one according to which rationality exhausts itself in ascertaining effective means to given ends. At this point, the potential for significant gains in sustainability inherent in the idea of service and flow is lost because it is no longer possible to treat the inherently more 'inconvenient' character of service and flow *as precisely its virtue*. The greater degree of coordination required by a service system, and its slower character, relative to its product-ownership competitor, now becomes a vice since the task of overcoming, through compensation and transformation, the inconvenience has been purged from one's understanding of what it is to shift from product to service. Economic and ecological sustainability now stand at odds with one another.

One may well ask why the idea has been seized upon in this way, thereby engendering a research effort which, for all its valuable insights and techniques, is becoming increasingly unsure as to whether 'servicisation' is a viable strategy for sustainability. Why does the general idea come to be seen as permitting us to eat our environmental cake and have it, too? In one way, the answer is easy: the idea has been seized upon and developed by economists and engineers, who are by and large trained to think of users, producers and consumers in end-means terms: economists because this conception of users, producers and consumers is part and parcel of their idealising away from the ethically, legally and technologically mediated chaos of economic life to that orderly abstraction they call the economy; engineers because they see themselves as finding and optimising means of realising the ends desired by their clients.

But to respond thus is more to evade than to answer the question, which now becomes why it should be so tempting to regard economists and engineers as those best able to turn the initial idea of service and flow, indeed of ideas for improving sustainability generally, into workable strategies. Why is our culture so ready to see sustainability as an economic-*cum*-engineering issue? This difficult question cannot be adequately addressed in a paper. Suffice, then, to say that the answer lies in that overly simple ontology of the world to which our modern culture is inclined,

an ontology according to which complex behaviours, whether of animate or inanimate entities, are functions of certain simple behaviours which the entities involved in the complex behaviours would display under certain idealised conditions. When the world is conceived as a whole itself containing wholes in this naively aggregative sense, it seems possible to intervene successfully in it *solely* in the manner made possible by economics or engineering. For these disciplines are at their most successful, both practically and theoretically, when they model phenomena as wholes in this aggretative sense.

In conclusion, let us note an objection one might make to the most decisive claim of this paper. It has been argued that in order to find sustainability in services, one must work with that richer conception of the human subject and its rationality which is implicit in much everyday thinking about sustainability and of course many other practical matters as well. To this one might object that its being thus implicit in everyday practical reason does not entail that the conception is right; perhaps it is just a pre-scientific myth unable to withstand critical examination. No adequate response to this objection can be given here. But such a response would surely proceed from the following thought: we will have every reason for thinking this conception of rationality right if a politics, economics and indeed an engineering based upon it enables us to shift towards a more sustainable society.

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I am very grateful to John Ehrenfeld, Will McNeill and Cameron Tonkinwise for some extremely useful comments and criticisms on the original version of this paper. Here it has not been possible to respond to some highly detailed criticisms made by a strong proponent of product-service systems. This response must be reserved for a larger work which will systematically explore the philosophical foundations of currently topical strategies for achieving a more sustainable socio-economic order.

Notes

1. Paul Hawken, Amory Lovins, and L. Hunter Lovins *Natural Capitalism: The Next Industrial Revolution*, London: Earthscan, 1999, pp. 10–11; see also pp. 16–19 and pp. 134–137.
2. For this reason, "(m)any see PSSs as an excellent vehicle to enhance competitiveness and to foster sustainability simultaneously." Arnold Tukker, 'Eight Types of Product-Service Systems: Eight Ways to Sustainability – Experiences from SusProNet' in *Business Strategy and the Environment*, Vol. 13 (2004), p. 246.
3. Tukker, op cit, p. 247.
4. Tukker, op cit, p. 247. With the phrase "factor 4–10 sustainability improvements" Tukker means the thesis advanced by Ernst von

Weizäcker of the Wuppertal-Institut, Amory Lovins of the Rocky Mountains Institute and many others that it is technologically possible to reduce materials and energy intensity by a factor of at least four and potentially even ten.

5. See R. Welford, W. Young and B. Ytterhus 'Towards Sustainable Production and Consumption – A Literature Review and Conceptual Framework for the Service Sector' in *Eco-Management and Auditing*, Vol. 5 (1998), pp. 38–56.
6. J.S. Nørgård, 'Efficient Technology and Inefficient Economy' in *The Energy Efficiency Challenge for Europe – 1995 Summer Study Proceedings*, Stockholm: The European Council for an Energy Efficient Economy, 1995.
7. Tukker, op cit, p. 258.
8. Eva Heiskanen and Mikko Jalas, 'Dematerialization through Services – A Review and Evaluation of the Debate', The Finnish Environment Report No. 436, Ministry of the Environment, Government of Finnland, Helsinki, 2000, p. 1. It is worth noting that neither engineering nor economics need take what Heiskanen *et al*. call the mainstream approach. Perhaps there can and perhaps there should be a political engineering, in a sense not dissimilar to that in which there is and should (continue to) be political economy.
9. I have been told that the average home power drill is in actual operation for some ten minutes of its product life although I am not sure whether I have remembered this correctly or not.
10. Tukker, op cit, p. 253.
11. 'Goods' in the sense of what is valuable or worthy rather than what is useful or saleable.
12. The notion of living well derives, of course, from Aristotle's notion of *eudaimonia* – see the *Nichomachean Ethics*, Bk. I, Ch. 5 and Chs. 7–13.
13. Heiskanen et al, op cit, p. 1; emphasis added.
14. Indeed, I would argue that this level is not working with the notion of well-being at all, but rather with a notion of the good life, understood as a state in which desire-satisfaction and virtue are in harmony with one another. The notion of well-being is a modern impoverishment of the older and original notion.
15. Research by Renson Meijkamp on car-sharing in the Netherlands (Meijkamp, Renson G. *Changing Consumer Behaviour through Eco-Efficient Services – An Empirical Study of Car-Sharing in the Netherlands*, Technische Universiteit Delft, 2000) provides some empirical evidence for the claim that if the shift to services is understood merely as enabling one to do *the very same things* in more sustainable ways, it will not, as a rule, generate truly significant gains in sustainability. The kind of car-sharing which Meijkamp considered had as its *desideratum* precisely what this conception of service and flow dictates,

namely, the ideal of replicating the convenience of private car ownership: "cars must be available at any time … 24 hours a day, even weekends." Of such systems, which, he says, have been seen as "a striking example of the theoretical concept of Eco-efficient Services" (p. 257), Meijkamp concluded, "The relative [environmental] advantage of Car Sharing schemes mainly results from the use of relatively light weight cars." (p. 255) He then goes on to say that "it is very unlikely that Eco-efficient Services, as a specific kind of innovation in function fulfilment will ever result in an improvement factor of 10, as has been suggested by some authors … ." (p. 259). Available online at: http://www.darenet.nl/nl/page/repository.item/show?saharaIdentifier = tuddare:oai:tudelft.nl:098332

16. That is, more optimal, both in the sense that internal reality, i.e., the rational agent itself, is more coherently rational and attuned to socio-economic and environmental reality; and in the sense that external reality, i.e., the rational agent's socio-economic situation, enables an enduring felicitous synthesis of ethical conformity and desire satisfaction, hence a synthesis which is itself attuned to environmental reality. Aristotle would call this optimality *sophrosyne* – see his *Nichomachean Ethics*, Bk. VI, Ch. 5, 1140b 12.
17. Searching for a more coherent alignment of norms, values and interests is something only a self can do. Indeed, it *pre-eminently* the kind of thing a self does. So to be successfully engaged in such re-alignment of interests, norms and values is to be most truly or fully a self – what Heidegger meant by *Eigentlichkeit*, which is not very adequately captured by the rather more substantive, hence misleading English word 'authenticity'.
18. Its best-known founding father is Thomas Hobbes (1588–1679), the greatest of English political philosophers, who expressly recommended that in order to achieve a truly scientific understanding of socio-political order, we should think of the human subject as an entity possessed of certain 'appetites' setting it in motion and a certain capacity for calculating more or less effective means for satisfying these 'appetites'. Contrary to a popular misunderstanding, Hobbes never thought of these appetites as solely self-directed, that is, as 'selfish' in any strict sense; they could be other-directed, as is a person's desire to protect and promote the welfare of certain other persons, e.g., family members, friends, etc. Indeed, it could include a person's desire to save the whales. For the crucial thing about 'appetites' for Hobbes was that they were *arational affectivities*, i.e., one's likes and dislikes concerning various features of the world.
19. See, e.g.: David Halpern and Clive Bates with Greg Beales and Adam Heathfield 'Personal Responsibility and Changing

Behaviour: the State of Knowledge and its Implications for Public Policy', Issue Paper of the Prime Minister's Strategy Unit, Cabinet Office, Government of the UK, February, 2004; and Emma Dawnay and Hetan Shah 'Extending the "Rational Man" Model of Human Behaviour: Seven Key Principles', Briefing note for the Environment Agency by the New Economic Foundation, Environment Agency (www.environment-agency.gov.uk), Government of the UK, 2005.

20. Dawnay and Shah, op cit, p. 3.
21. This second conception of human rationality displays another important feature: unlike the first, it must attempt to *explicate* the fact that human beings wield and respond to ethical notions. *Any* account of human rationality must be able to *explain* why we humans have a sense of the ethical, that indeed, in a situation in which there is no significant difference in personal cost between doing what is ethical and not doing it, most humans will do what is ethical. Thus, one might argue in evolutionary terms that unless humans had a sense of the ethical and the conditional preference just indicated for doing the ethical, they would never have survived. But advocates of this second, leaner and meaner conception of human rationality must attempt something more than this. They must seek to *explicate* or *analyse* ethical notions in terms of such things as survival of the species, preservation of the individual, or again, happiness or well-being (whereby these latter notions must not be understood as entailing anything normative or axiological since otherwise the account would be circular).

    Hobbes, for example, the first great thinker to wield this notion of rationality in a powerfully explanatory model of social order, attempted to show how political obligation – the fact that, as a member of society, one ought to obey the laws of society – could be understood as a matter of enlightened self-interest: the claim that one ought to obey the laws of society *just is* the claim that it is in one's interests to do so. All hands are agreed that, typically at least, it is in one's interests to obey the laws of society. Hobbes, however, is making a much stronger claim. He is saying that one's political obligation to obey the laws of society *just is* its being in one's interests to do so.

    In general, advocates of this conception of human rationality have always championed *utilitarian* and, more recently, *evolutionary* explications of the ethical. They have typically sought to explicate what ethical words and concepts *mean* in utilitarian or evolutionary terms: *x* is right or good *just means* that *x* facilitates the greatest happiness of the greatest possible number, or again, the survival of the species.
22. Heiskanen, Jalas and Kärnä, op cit, p. 1.

23. In campaigns to improve water conservation and quality run by the municipality of Manly in Sydney, New South Wales, Australia, regulation was needed for some 6% and 10% of the constituencies involved – see Scott Machar and Jane Murray 'Is Regulation the New Education? Alone, no, but together - what a formidable team!', Proceedings of the NSW Environmental Educators Conference 'Vision into Action', Warilla, March 9–11, 2006, p. 4. So for between 90% and 94%, it was not! Between 90% and 94%, if they were not already doing the right or at least prudentially advisable thing, had only to be told what it was.
24. Sticks, in particular, are not means of creating radically new behavioural practices since they are primarily means of minimising free-loading. In other words, their primary function is to maintain the conditions under which that majority of participants in an *existing* self-reproducing practice who are disposed to conform to it without threat of punishment can rationally do so.
25. That service systems depend for their viability on more extensive forms of obligation and liability and more flexible legal systems has long been recognised by earliest proponents of service and flow, e.g., Walter Stahel. For a very recent and extensive statement of his position see his book *The Performance Economy*, London: Palgrave, 2006.
26. Tukker, op cit, p. 249.
27. Tukker, op cit, p. 257.
28. See Hawken, Lovins and Lovins, op cit, pp. 115–118 and elsewhere.
29. This does not really contradict the claim made by Ehrenfeld and Brezet that the use of services "has the distinct character of a commodity." Ehrenfeld and Brezet are not understanding the notion of commodity in the politically economic sense intended here, namely, as a translation of Marx's notion of a *Ware* (ware); rather, they intend the notion to be understood as Borgmann understands it, to whom they explicitly refer at this point. John Ehrenfeld and Han Brezet, 'Towards a New Theory and Practice of 'Sustainable' Product/Service Systems', unpublished paper, 2007, p. 9. This is not to imply agreement with the claim that services are commodities in Borgmann's sense. The direct purchase of service, as opposed to its provision through product ownership, hence product purchase, surely need not exclude learning and lead to de-skilling, with its concomitant loss of autonomy and increased dependence on the service seller. One can imagine a power tool hire co-operative governed by the expectation that hirers will take at least the same care of the tools they hire as power tool owners currently take of the tools they own. Nor it is inconceivable that the power tool one hires could acquire

the same personal significance as the power tool one owns, e.g., the drill in the course of hiring which one met one's future wife. Finally, while modern consumer society certainly does encourage the reduction of things to mere means of desire satisfaction, one must not overestimate how many objects in my life can have more than mere use value for me. For every object in my life with real value for me, for which, therefore, I am prepared to care, there are others which I simply cannot, on pain of irrationality, treat as anything more than a commodity in Borgmann's sense. Now issues of sustainability arise at least as much for these latter kinds of object. So while one can enhance sustainability by promoting a culture of valuing and caring for everyday things, one must also deal with the problem of the unsustainable production and consumption of the merely useful.

Of course, there is fundamental agreement with the general thrust of Ehrenfeld and Brezet. For Ehrenfeld and Brezet also argue that the shift to services will only enhance sustainability if it is not understood as simply a clever business strategy. Thus, they speculate that one might be able "radically [to] extend the idea of product/service systems" by asking, for example, "whether the technological offerings to be found in the market place of affluent communities satisfy the human striving for authenticity, that is the discovery of one's 'true' self." (p. 9) With this, they intimate a understanding of the shift to services in which the re-jigging of preferences is embedded from the outset.

30. In Meijkam, op cit. See note 15 above.