(THEMATIC) EUROPEAN RESOURCE STRATEGY AND SUPPORTING RESOURCE HIERARCHY DISCUSSION PAPER

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This discussion paper proposes a European (thematic) Resource Strategy and supporting Resource Hierarchy to: provide a 'whole-life' framework for the stewardship of natural capital use through the productive economy ■ measure and link natural capital extraction to use ■ bring a supply chain focus to addressing market failures impeding greater resource circularity ■ contribute to delivering progress towards sustainable resource management and the establishment of a vibrant circular economy.

BACKGROUND

1. The Stern Review concluded climate change represented: *"the greatest market failure the world has ever seen";* waste represents the second. Since the Industrial Revolution, most economic activity has followed linear patterns of production and consumption, traditionally supported by cheap and plentiful virgin resources (e.g. coal and minerals etc.), reinforcing the 'take-make-consume-dispose' model.

A PROBLEM OF FOCUS

2. Since its early '70s origins, European environmental legislation importantly centred on the control of waste to protect human health and avoid environmental pollution. The European 'Waste Hierarchy' ranks waste management options according to what is best for the environment, where highest priority is given to waste prevention followed in descending order by: re-use, recycling, recovery, and finally disposal (e.g. landfill). However, whilst subsequent EU-Environmental Action Programmes have brought more policy prominence to sustainable production and consumption, much of the underlying policy emphasis is still on strengthening waste legislation.
3. It is increasingly being questioned whether adequate transitional progress on resource circularity can be delivered through the current European Waste Hierarchy; where policy interventions focus rather dogmatically on ever higher end-of-life recycling targets, but where these exert little influence on the upstream supply chain. Additionally, systemic change within the productive economy cannot be left solely to prevailing market forces. For example, consider recent claims that users of recycled plastic are switching back to virgin polymers, as the former's value falls due to low oil prices.

A (THEMATIC) EUROPEAN RESOURCE STRATEGY AND SUPPORTING RESOURCE HIERARCHY

4. In its 'indicative roadmap'[1] on the circular economy, the European Commission acknowledges one of the main reasons for withdrawing its 2014 Circular Economy Package as a "rather exclusive focus on waste management." Whilst resource is the main subject of the policies and studies referenced, the Thematic Strategy on the Sustainable Use of Natural Resources, as proposed in the previous 6th Environmental Action Programme (EAP), is conspicuously absent. Under one of three main themes, the current 7th EAP aims to *"protect, conserve and enhance the Union's natural capital".*

[1] http://ec.europa.eu/smart-regulation/impact/planned_ia/docs/2015_env_065_env+_032_circular_economy_en.pdf

5. An overarching European thematic natural resource strategy would bring a whole-life perspective to the stewardship of national natural resource use and be central to the sustainable management of Europe's resources. Where economic activity would be decoupled from the rate of natural resource consumption, and embedded resources within closed-loop systems minimise leakage into the biosphere. Metrics (which are currently being developed) would link natural resource extraction to economic use and inform key resource targets reflecting the (un)sustainability of resources, particularly those at risk.
6. A European Thematic Natural Resource Strategy and supporting European Resource Hierarchy (see page 5 for diagram and table of terms used) would bring a whole-life perspective for the stewardship of natural resource use and be central to their sustainable management nationally. However, this proposal has much wider applicability to sustainable resource management from the local through to the international level.
7. Linking resource extraction to consumption is perhaps most meaningful when considered for a specific industry sector (e.g. hydrocarbon flows through the plastic packaging sector), rather than at the individual product level. This proposed resource hierarchy begins with 'unextracted' natural resources. This is important because European legislation and policy needs to develop much better linkages between the extraction of natural resources and their subsequent whole-life stewardship through the productive economy. Decisions made at the design stage (for example eco-design for disassembly enabling later closed-loop recycling) are crucial to all subsequent life-cycle stages in the productive economy.
8. Post-extraction, virgin resources undergo 'conversion' via various manufacturing and production processes. Subsequent tiers in the resource hierarchy broadly adhere to those in the waste hierarchy, where environmental preference reduces as options descend the hierarchy. Whilst waste would not exist in a functioning circular economy, transitionally, some landfill will be required. However, this would increasingly be only after all cascade recycling opportunities have been exhausted.
9. The resource hierarchy would not be intended for rigid interpretation; in instances where independent evidence, such as that from life-cycle assessment studies, demonstrates greater environmental benefits, a lower-tier hierarchy option could take precedence. It is envisaged that through transitional arrangements, an EU-Resource Hierarchy could supersede the EU-Waste Hierarchy.

Metrics for sustainable resource management

10. Major economies are by their nature complex. Assessing progress towards sustainable resource use will necessitate wider data needs than presently available. Robust data and information, underpinned by sound science and accounting methods, are central to evidence-based environmental and economic policy making, smarter regulation and wider market-based interventions.
11. Key resource flows through major national economies are increasingly understood. Employing appropriate supporting metrics would enable natural capital extraction to be better compared with proven reserves, indicating the extent of UK/European (un)sustainability in key areas of resource use (e.g. hydrocarbons). Importantly, the EU's 2011 Roadmap to a Resource Efficient Europe identifies the need for robust indicators to measure economic performance whilst reducing pressure on natural resources, as well as to assess the consumption of key global natural resources. This is seen as vital to structuring targets for natural capital (or

natural capital) flows. Annual environmental accounting would enable Member States' to report progress towards sustainable resource use, indicating Europe's contribution to global resource depletion.

12. In England, the Natural Capital Committee[2] (NCC) has been asked to advise on "when, where and how natural assets are being used unsustainably". It is currently developing a system of measurement for natural capital and contributing to the development of an accounting system, working with the Office for National Statistics (ONS) and UK Department for Environment, Food and Rural Affairs. In addition to measuring natural capital, metrics will also need to identify which assets are at risk.

13. One particularly challenging aspect will be how to reconcile the loss in one area of natural capital (e.g. species and sub-soil assets) by the extraction of another (e.g. minerals.) Better data on exports/imports would also enable 'net resource migration' to be quantified and progress towards resource security identified. In turn, greater resource circularity during production and consumption reduces pressure on natural capital reserves, such as hydrocarbons.

14. The sustainable management of resources also includes recognition of 'environmental limits'. For example, where hydrocarbons are concerned, it is increasingly realised that, unless major economies rapidly accelerate towards embedding carbon, there is an urgent need to restrict carbon dioxide releases into the biosphere. In such cases where environmental limits are the primary consideration over resource scarcity, other choices such as material substitution would be necessary.

EUROPEAN COMMISSION SUBMISSION

15. Functionality is central both to the European Commission's awaited Circular Economy Package (promised later this year) and its longer-term vision for 2050, as laid out in the 7th Environmental Action Plan. This concerns living within the planet's ecological limits, where prosperity and a healthy environment stem from an innovative circular economy.

16. The UN Environment Programme projects[3] global demand for raw resources could treble by 2050 under a business as usual scenario. Their 'moderate contraction and convergence' scenario, with significant decoupling of virgin resource consumption, still implies roughly a 40% increase in annual global resource use with associated environmental impacts. Concurrently, other priorities will need to be met including: climate change adaptation, enhancing biodiversity and protecting our last remaining wild places.

17. In summary, this evolving proposal is intended to initiate discussion and stimulate lively debate, on the ongoing role for a Thematic European Natural Resource Strategy and supporting Resource Hierarchy, in delivering sustainable resource management. As such, its use could potentially help bring a coherent focus to European/International policy thinking.

[2] https://www.naturalcapitalcommittee.org/

[3] http://www.unep.org/resourcepanel/decoupling/files/pdf/decoupling_report_english.pdf

18. On 21st April 2015, the original idea for a new European Resource Hierarchy was submitted to European Commissioner Karmenu Vella for consideration by DG-Environment, Maritime Affairs and Fisheries. This is now a part of a wider proposal and is subject to ongoing development for a European natural resource strategy and supporting resource hierarchy. Without this overarching strategy, I have concerns there will not be sufficient legislative and policy coherence to address supply chain blockages and deliver more sustainable management of Europe's natural resources. Systemic change within the productive economy cannot be delivered through prevailing market forces. For example, consider recent claims that users of recycled plastic are switching back to virgin polymers, as the former's value falls due to low oil prices.

DIAGRAM: EUROPEAN RESOURCE HIERARCHY

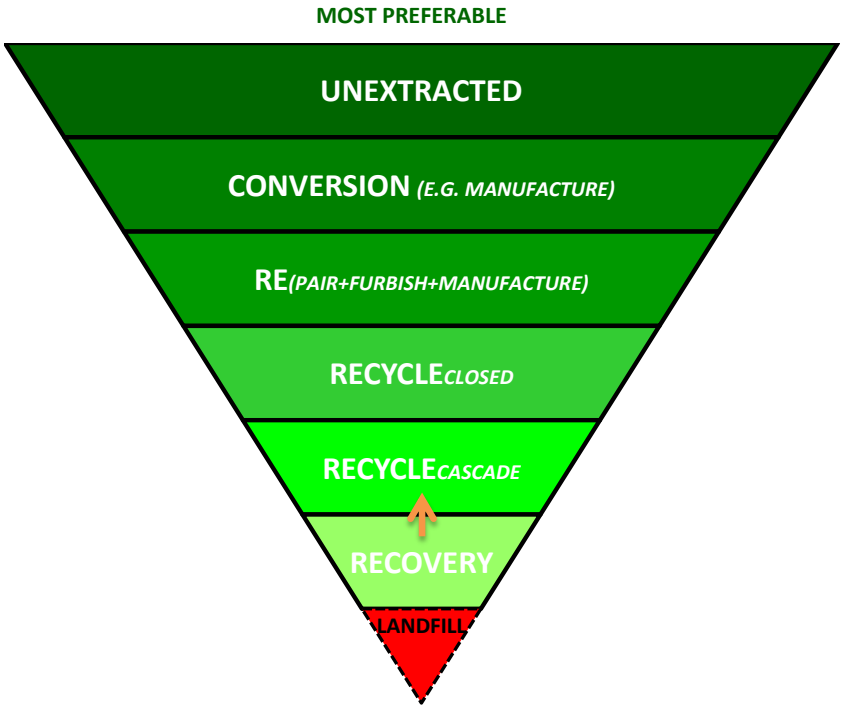

TABLE OF TERMS

RESOURCE HIERARCHY TIER	DESCRIPTION
UNEXTRACTED	Virgin resources in the biosphere; unextracted natural capital reserves (e.g. minerals and ores) whether proven, or otherwise.
CONVERSION*	Conversion of extracted resources into products and services via manufacture.
RE*(PAIR+FURBISH+MANUFACTURE)*	Products that undergo reuse, repair, refurbishment or remanufacture, resulting in their retained use within the productive economy.
RECYCLE*CLOSED*	Closed-loop recycling within the original manufacturing facility or sector, for the same or similar purpose.
RECYCLE*CASCADE*	'Cascade recycling' or 'down-cycling': resources recycled after product 'end-of-life' in different value streams. As resources descend the cascade their value declines (entropy increases.)
RECOVERY	Nutrient leakage into the biosphere is minimised by restricting energy recovery to resources from which all further cascade recycling opportunities have been exhausted. The arrow to RECYCLE*CASCADE* from RECOVERY represents subsequent use in manufacture (e.g. inert ash used as in secondary aggregates.)
LANDFILL	In a functioning circular economy waste does not exist and no resources would be landfilled, other than for subsequent storage/ mining. Transitionally, some landfill will be required, but only when all cascade recycling opportunities have been exhausted.

***** *In practice, additional interim steps exist: 'extraction' takes place before conversion and 'use' and 'reuse' before RE(pair+furbish+manufacture); these are not shown above for simplicity.*

THE EUROPEAN RESOURCE STRATEGY AND RESOURCE HIERARCHY: SUPPORTING NOTES

A European Resource Strategy and European Resource Hierarchy:

- ✓ Proposes a fundamental policy shift towards a whole-life resource framework, rather than use of end-of-life product measures aimed at ascending the EU-Waste Hierarchy via strengthening waste legislation.
- ✓ Should not be applied from an end-of-life waste viewpoint; instead it adopts a cradle-to-grave approach to resource use in the productive economy, starting before new products and services come onto the market for the first time.
- ✓ Centres on resource use presented in descending order of preference; starting with unextracted virgin resources (i.e. technical and biological nutrients) existing in the biosphere. Ascending the European Resource Hierarchy is preferable from a sustainable resource management perspective.
- ✓ Is intended for practical interpretation and use by policy and decision makers at a national, European and International level.
- ✓ Reflects the need for a policy transition from recycling targets to resource targets that better reflect extraction and depletion rates for natural capital flows, and their leakage away from the productive economy.
- ✓ Is intended to catalyse greater legislative and regulatory harmonisation between the needs of business and the protection of the environment, where the sustainable management of natural capital reserves are concerned.
- ✓ Will require both legislative and policy harmonisation and transitional arrangements away from the EU-Waste Hierarchy and the production of guidance for interpretation by individual Member States.
- ✓ Will still require necessary controls to protect human health and avoid environmental pollution. However, minimal restrictions associated with waste legislation would be expected above cascade recycling activities.
- ✓ Is not intended to be interpreted rigidly. In instances where independent evidence (e.g. Life-Cycle Assessment studies) can show that greater environmental benefits result, a lower-tier hierarchy option can take precedence.
- ✓ Resources are deemed to reside within the productive economy when located at any level between conversion and recovery.

ABOUT THE AUTHOR

Dr Stuart McLanaghan is a sustainable biz professional. He played a pivotal role in developing the world's first circular economy standard - BS 8001 and has advised the UK Prime Minister's Strategy Unit, Cabinet Office on new and emerging technologies to deliver the EU-Landfill Directive. A BBC Food Hero, he developed 'fells to plate' traceability for wild meats for Waitrose. Advisor to UK Prime Minister's Strategy Unit (Cabinet Office). Stuart has a PhD in environmental management from Imperial College, London and is a Chartered Waste Manager.

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