

25 The actions of individuals

Lifestyles, behaviour and individual choices

Sustainability always involves dialogue between the trinity of business, government and individuals (as voters and consumers). So what's the role of individuals in bringing about a material efficiency?

All discussions about moves towards a more sustainable future end up caught in a loop with three players: businesses, the government and individuals. Should businesses “take responsibility for their actions” and clean up their act? Should government lead and set rules so that individuals and businesses operate in a more sustainable manner? Should individuals vote with their wallets and ballots to direct businesses and governments to take more sustainable decisions? Always the balance of responsibility between these three is at the centre of discussion about change, and the role of many of the other organisations illustrated in our map of “who’s involved” in chapter 6, in research, education, journalism and lobbying for example, is to keep illuminating, probing and pushing to try to support simultaneous action from all three. In our experience, all three parties are willing. The most informed experts on the environmental impacts of steel and aluminium production are within the industry, and have ideas for improvement but can’t apply them: if they put costs, up their customers will shift to cheaper producers elsewhere with worse environmental performance. Within government, we have expert scientists informed by the most up to date measurements, giving balanced and accurate opinions to politicians but, even if willing, they cannot put forward policies which decrease the chance that they will be voted back in next time. Meals around the world are shared by concerned individuals, aware of the issues, concerned for their grandchildren, but often unsure about meaningful actions, and short of time to seek out alternatives to mainstream commercial norms.

So having looked at business and policy, this chapter is about you—you as an employee, you as a consumer, you as a voter. What can you do to help bring about the change we’ve put forward in this book?

Your purchasing decisions: are you buying a... ...building?

- Is there an existing building that meets your needs? Re-using whole buildings is much simpler than arranging deconstruction and new design.
- If no existing building is quite right, tell the design team that both embodied and use phase energy reduction must take priority in all subsequent decisions. If they're not confident about embodied energy, point them towards existing reliable sources of data (such as the ICE database, available online) and re-use as much as possible of previous buildings on the site. Make sure that unwanted old components are extracted carefully and sold for reuse.
- Specify reused steel and plan ahead to allow fabricators time to source steel for reuse. Give the design team time and flexibility to accommodate the material found by the fabricator.
- Alternatively, rather than using standard reused components, you could design an iconic lightweight building and save up to a third of metal.
- Make sure that the building can be disassembled for reuse at the end of its useful life, for example by including a deconstruction plan as part of design.
- Think about what you (or subsequent owners) are likely to want from the building in future: is your business expanding; will you need different access, different ceiling heights or different floor plans in future? Engage the design team in discussions about how the building could be adapted to meet these uncertain future needs.
- In all cases try to eliminate excess loading allowances and materials specified 'to be on the safe side': meet the building regulations without exceeding them. Plan carefully with the contractor to make sure that materials are not over-ordered. Be willing to bear a slightly higher cost and tell the fabricator not to "rationalise" the beams specified. Likewise, insist that the mix and geometry of concrete elements are not greater than necessary. Investigate with the contractor the time, cost and material savings possible by using pre-fabricated components which can be reused later.

- If you choose to use steel or aluminium for aesthetic components (e.g. fixtures and fittings or an aluminium curtain wall) ensure that they are protected against corrosion and will remain attractive over a long life.
- Once it's built be sure to maintain your building. Make sure the building design drawings are kept secure, are updated if you make any modifications and passed on to future owners so that they can modify the building with confidence.

...infrastructure?

- Take a look at our suggestions for buildings; many of them apply to infrastructure too, but even more so as we usually want infrastructure to last as long as possible; use whole-life-costing to aid your decision-making, and make sure you really understand the consequences of purchasing based on lowest initial capital outlay, even if that's your normal practice.
- Consider capacity carefully: can the infrastructure be modular so that capacity can be added incrementally, or removed and used elsewhere as demand changes over time?
- The lifespan of current infrastructure in the UK is far shorter than intended due to poor workmanship during original construction. Negotiate guarantees and terms that ensure contractors are motivated to achieve the quality standards required to guarantee long-life.
- Design condition monitoring from the start, and use it intelligently to inform maintenance.

...industrial equipment?

- As with commercial buildings, make sure you value your options over a long time span; at the least you should compare them over their entire useful life. Be sure to include all costs in your decisions: maintenance costs, operating costs and future replacement costs. Make the case for a more durable product by comparing the average cost of ownership. Ensure you have guarantees in the service contract to provide lifetime operation and upgrade.
- Can you specify a modular design that guarantees longevity for the equipment, as new innovations emerge over the next 50 years?

- If your machine is making metal products, how flexible is it, and how well does it fit the whole production chain from liquid metal to product. When you also consider supplier and customer options? Perhaps the products you are making aren't actually what your customers need? Make sure that the machine can, as part of normal operation, separate out any valuable off-cuts and sell them on, preferably for re-use rather than recycling.
- Design the equipment so it can be turned on and off rapidly, does not consume energy when idle, and has correctly specified variable speed electric motors.
- Don't forget to brag about your sustainable material success—you deserve the credit and you will encourage others to follow your inspirational lead.

...private car?

- Do you really need one? Would a bicycle, sharing with a relative, or membership of a car-sharing scheme be sufficient instead. Lobby your MP for improved public transport connections. Set up a car pool with colleagues at work and offer the neighbour's kids a lift to school on the way.
- If you decide to go ahead and buy a car, buy one with the lowest fuel consumption but also keep an eye out for information on embodied energy—most car manufacturers include some information about this on their websites. Be sure to tell the dealership that you're interested in the embodied emissions. Maybe you could suggest that they display this information?
- Now that you've had the car for a while, are you getting attached to it? All those wonderful memories? Can you keep it for longer and upgrade to a lower emitting engine? Maybe that's something you should suggest to the dealership too, or to the car manufacturer?
- Oh and don't forget to follow the maintenance schedule, it's probably in the glove compartment.

...appliances?

- Buy a size that's appropriate for your needs—you probably don't need to walk in to your fridge. If you later find it's too big or small, swap it with someone else with the reverse problem.

- Try to negotiate a guarantee on your fridge, washing machine or microwave, as part of the purchase contract. A minimum of 25 years would be good.
- If it breaks down, see if you can get someone in to fix it and if not, make sure that you tell the supplier how dissatisfied you are and publicise their response. You shouldn't have to buy two fridges in your lifetime.

...packaged product?

- Negotiate contracts so that the supplier must take back all packaging that comes with your goods: most packaging is used before the final consumer, so motivate your supplier to switch to reusable systems.
- At home, can you use your own packaging to avoid the ever-growing collection of plastic bottles in the garage? Choose products with minimal packaging and make sure you recycle it.

The decisions you make when you no longer want your product

- Could someone restore the product to its original condition or upgrade it to meet new requirements?
- Who might want the product in its current state? Could you sell or give it to them? Be sure to pass on any information you have on the product to help with future maintenance, repair or upgrade.
- Can the product be broken down into its component parts and be re-used? Could you yourself re-use any part of the product? Can you use information from the original design to add value to the components, for example where steel has been certified?
- If it must be abandoned, removed or discarded, allow time for de-construction or disassembly to maximise the value of the components and materials that could be re-used.

Decisions you make at work: are you...

... involved with product design?

- Aside from cost and material properties, be sure to take into account embodied emissions in your material choice and educate clients about their significance. Can you reduce the embodied emissions of the product, while also reducing yield losses in its manufacture? Can you re-design it in some other way to reduce yield losses? Can you use re-used materials as part of the design?
- Are you designing the right product? Is your product design constrained by its final use, or by requirements arising in the journey from production to use, as we saw in cooking food cans and installation for line pipe? Are there any opportunities for change?
- What change in future might make your product obsolete? Can you design your product to adapt to these changes? Maybe design it with upgrades in mind or make it modular? If not, make sure to optimise your product over a suitable life: meet but don't exceed requirements and explore all options to design with less material.
- Use the onion skin model of design to make sure that shorter-lived aesthetic components, or components that may fail, or those likely to be superseded can easily be separated from long-lived structural components.
- Include in the design a plan to disassemble the product at the end of its useful life, so its component parts and materials can be re-used or recycled. Document the product's specification and the materials used for each component, and make sure this is accessible to future owners.
- Engage in development of standards or guidelines to ensure they reflect material efficiency.
- Celebrate the low embodied energy and material efficiency of your designs as part of their branding.

... involved in product manufacture?

- Search tirelessly for opportunities to reduce yield losses within your operations, and along the whole production chain, for example tessellating large and small

parts to improve stamping yield. Take a look at the metal that you're buying. Is it the right shape? Could you tell your supplier what shape you really need and see if they can make it for you? Speak to your customers. Are you delivering what they really need? Can you capture more value by reducing their need to shape components?

- Push for research and development into new manufacturing processes that cut yield losses. Blanking and deep drawing cause the biggest waste of sheet metal for both steel and aluminium and can be replaced already by laser cutting and spinning. How can we cut and shape sheet metal at high speed with low yield losses?
- Segregate metal waste for reuse and recycling. Look for opportunities to cut small blanks from skeletons and perhaps try using solid bonding to add value to your aluminium swarf.
- Explore different service contracts with customers so you can add more value downstream while requiring less metal purchasing upstream.

...working in the steel or aluminium industry?

- Aim to exploit all the efficiencies we've identified, including more efficient processes, better management of heat, and heat recovery from hot products and by-products. Seek opportunities to trade low-grade heat for district heating or to low temperature industries.
- Integrate downstream to extract more value from less liquid metal and work towards selling metal as a service not a commodity.
- Recognise that any overall expansion in primary capacity will deny emissions reduction targets, while aiming to expand secondary production. Support better separation and collection of end-of-life waste streams. Support exploration of carbon capture and storage and novel process development while retaining a realistic view of their likely costs and capabilities.
- Support development of the market for re-use by providing re-certification.
- Aim at greater transparency with energy, emissions and material efficiency data, copying the approach we saw at Alunorf with EMAS certification.

...working in the cement industry?

- Pursue every known efficiency and substitution option while exploring carbon capture and storage and novel cements with realistic expectations.
- Begin development of reusable concrete systems—focus on concrete as a provider of service rather than cement as a commodity.

...working in the paper industry?

- Pursue every known efficiency improvement. Explore alternatives to pulping during recycling to reduce down-cycling.
- Explore options for lighter weight paper and technologies for removing print from paper.
- Promote use of novel inks and dyes that can be removed from used paper more easily.

...working in waste management?

- Support improved separation and collection of aluminium, particularly cans and food packaging and develop plastics separation and recycling to maximise value from all plastic wastes.
- Re-prioritise re-use over recycling.

...working in insurance?

- Collaborate in developing new assessments of risk to allow development of a future market in materially efficient products. For example find new appropriate methods to evaluate and trade risks for re-used structural steel, or for lighter weight designs for buildings and vehicles.

...working in marketing and advertising?

- Provide validated information on embodied energy and life-spans as part of product messages.

- Work towards new customer relationships based on longer term service models requiring a reduced flow of new materials.

...working in education and research?

- Develop teaching about scale in global emissions and opportunities to address environmental problems with both eyes open.
- Clarify, evaluate and validate emissions data, and claims about improvements to processes and products.
- Develop novel technologies, systems and business models to support future material efficiency.

...working in accounting and finance?

- Promote appropriate evaluation methods when making material purchase decisions; raise awareness of the different consequences of decisions based on initial capital outlay and decisions based on whole life costing.
- Invest in companies that use materials efficiently and the technologies that enable them.

...working in retail?

- Work with suppliers to put durability labels on products.
- Explore options for refillable packaging.
- Give priority shelf space to durable and reusable products.

...working in government?

- Turn back to the previous chapter!

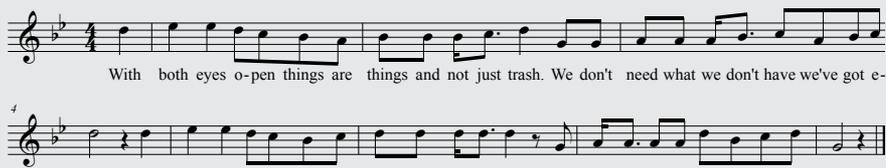
Outlook

The logic behind the current pursuit of options with one eye open is that changing consumer or voter behaviour is the most difficult option, so it's better to try to solve everything within existing industries. But as we've seen, there aren't enough options with one eye open, so we need to open both eyes. This chapter has aimed to demonstrate the very broad range of actions that individuals, as private or employed purchasers or through their professional skills, can take to support the development of future material efficiency. When we examined the difference between the Aquatics Centre and the Velodrome at the 2012 London Olympics site, we found that the Velodrome was twice as light per seat. This difference occurred primarily because development of a light solution was a target early in the design process and became an integral part of the project. The most radical changes required to support development of the material efficiency strategies we examined in Part III could be brought about simply by this approach: if purchasers, at the point they are about to agree to a deal, specify the relevant features of material efficiency that we have outlined in this book, they will in many cases be able to achieve them, with little if any additional cost.

With one eye open we cannot achieve our targets for a sustainable material future. And there's no point hoping that someone will innovate and find a new way to make the materials. They can't. We can't boil water without a threshold level of energy, and the same applies to materials. But with both eyes open, we can do it. It requires change, but we're optimistic. It'll be interesting and enjoyable being part of creating the change, and we're all involved.

With one eye open, we cannot get there, and are just "meeting trouble half way" as Joseph Conrad's Captain MacWhirr would say. Instead we should follow his example and set sail, bow first into the storm: "Facing it—always facing it—that's the way to get through... Face it." With both eyes open, we can face it, and plot a path through the storm. We need to think in a different way, we need to recognise a set of options that we've ignored to date, but we've shown that we can do it: we can do enough to set up a sustainable material world for our children at least as good as the one we're enjoying now.

Showtime ♩ = 96



With both eyes o-pen things are things and not just trash. We don't need what we don't have we've got e-
nough. With both eyes o-pen we're not mea-sured by our cash, the stuff of life is life and not just stuff.