EFFICIENCY FOR ACCESS

UK ENGINEERS WITHOUT BORDERS

Efficiency for Access Design Challenge Webinar: Product Lifecycle

19th March 2020

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UK ENGINEERS WITHOUT BORDERS

Federico Magalini

- Mechanical Engineer, holds a PhD in Management, Economics and Industrial Engineering from Politecnico di Milano University
- Experience on e-waste management, capacity building and policy, including expertise on Operations & Quality, take back scheme for e-waste, batteries, PV, and other industrial waste streams
- Managing Director of the UK branch of Sofies, providing consulting, project management and services in the field of sustainability.

Declan Murray

- Internationally-recognised expert on the deployment of off-grid solar technologies in the Global South
- Work on repair, recycling and waste management, having completed a doctoral thesis on these topics from the University of Edinburgh, with a geographic focus on Kenya
- Advises companies, donors, investors and NGOs alike on making products, projects and processes to be more sustainable.

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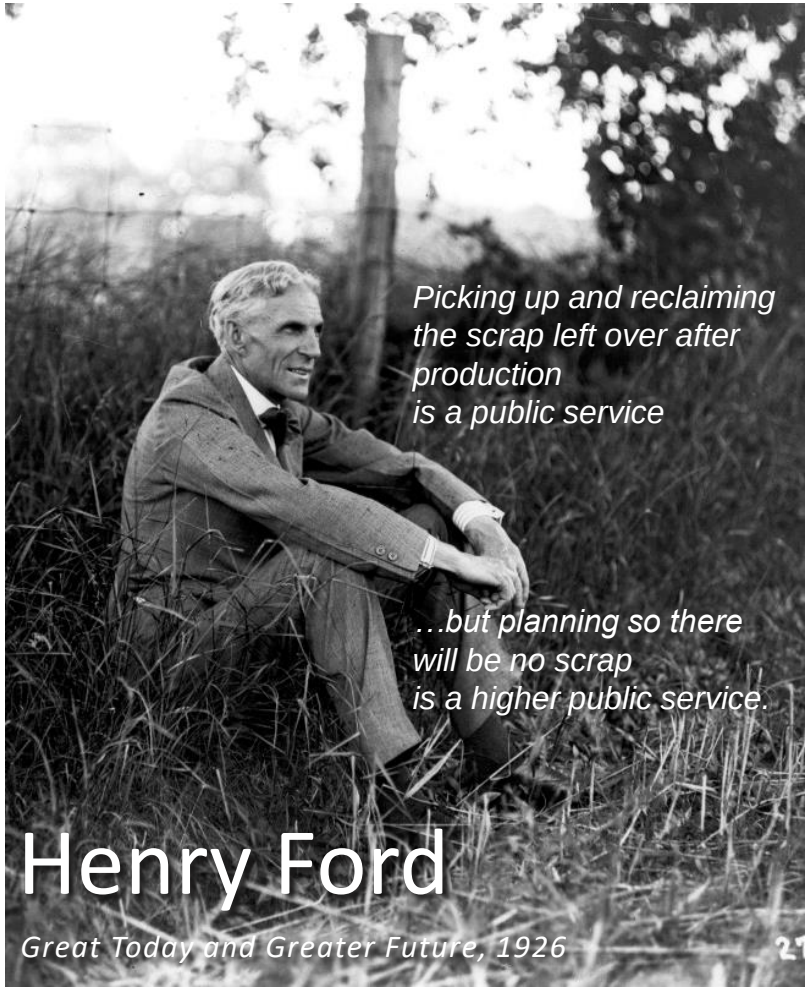
Circular Economy & Off-Grid Solar Sector

Federico Magalini

The circular economy

Perspectives on the future

- Access to Energy enables huge societal benefits (sanitation, education, food preservation, clean-cooking,…)
- Also exposes segments of populations previously not exposed to electronics
- Products need to be “designed to last”, easily maintained, with safe materials, compliant with mandatory and voluntary standards
- Consumers & customers have to be pro-actively engaged, as they play a key role



Why do we need rules/standards

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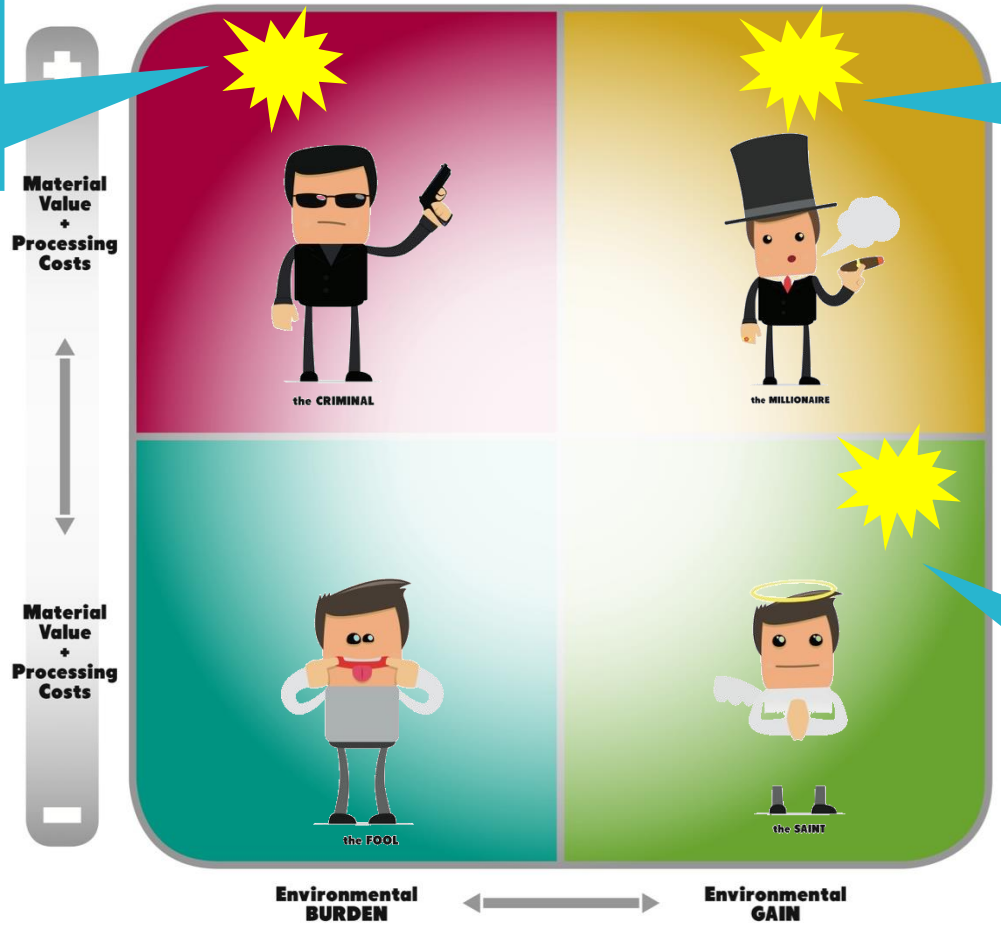
"Setting" the rules

"Pushing" for Best Available Technologies

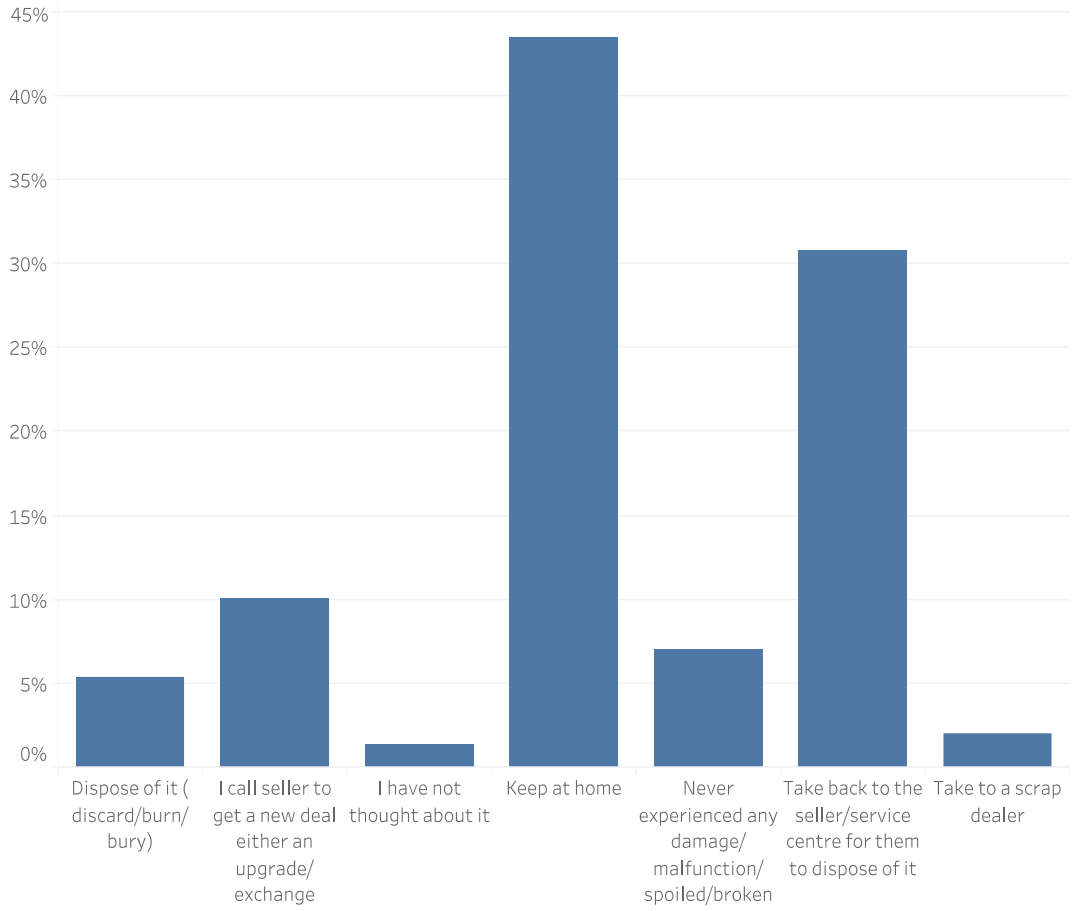
"Shaping" operations

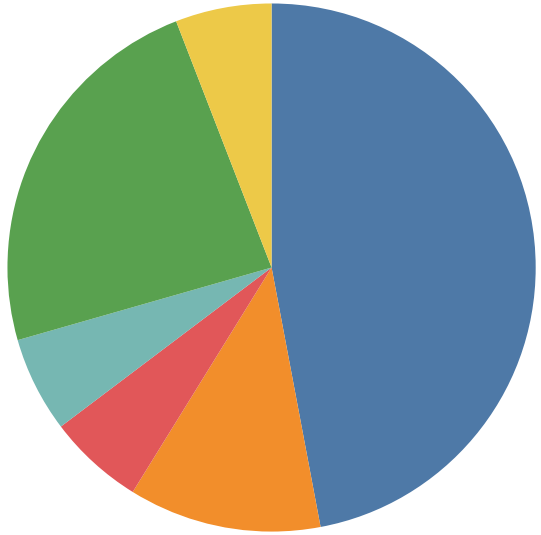


Business Perspective

Environmental (societal) Perspective

The risks & opportunities at EOL for OGS





If you dispose/discard the product, where do you throw it away?

- Burn it
- Bury it
- Damp it at fundis place
- Dispose with trash
- Leave it outside somewhere
- Throw away in the trash

Options to foster collection & recycling

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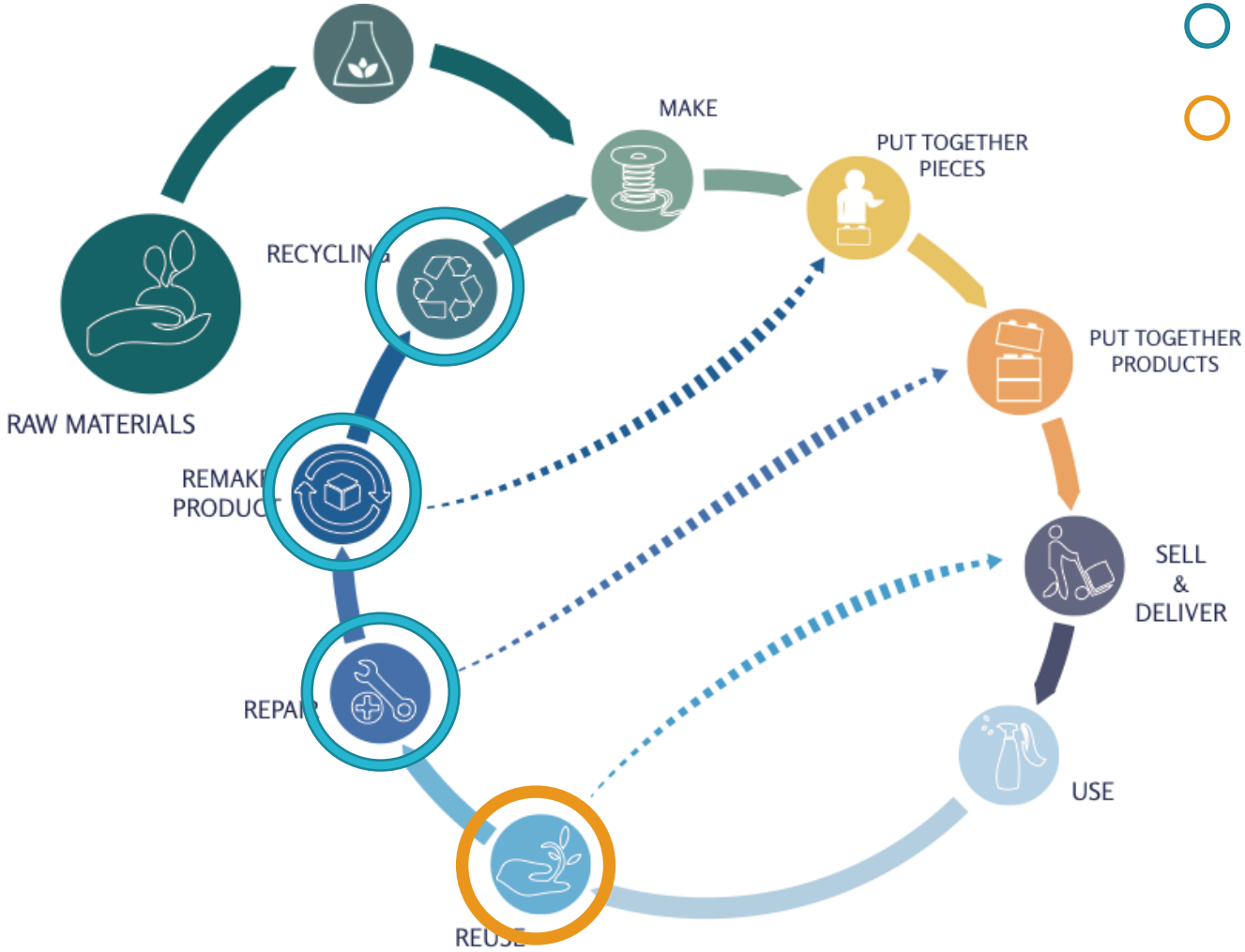
Reverse Logistics Scenario	Waste Stream		
	Small Appliances	Off-Grid SHS	EEE
Retailers & Distributors acting as reverse logistics players	More difficult as products are usually sold and they have low residual value	Easier, for PAYG stream	Never done before, as Industry waiting for legal obligations
Maintenance services	No network of collection of waste from repair centres	Easier, for PAYG stream (also after warranty)	Never done before, as Industry waiting for legal obligations
Network of collection by recyclers	Incentive to set-up collection centres (consolidation) if more waste is being collected; those might complement collection infrastructures from government (currently not available)		For B2B users agreeing to pay to dispose
Informal collectors	Hard to collect in rural areas and low-value products (no valuable components, only spare parts)	Major risk for Pb-batteries	Hardly possible for formal recyclers, mainly done by informal recyclers or scrap dealers

Circular Economy principles

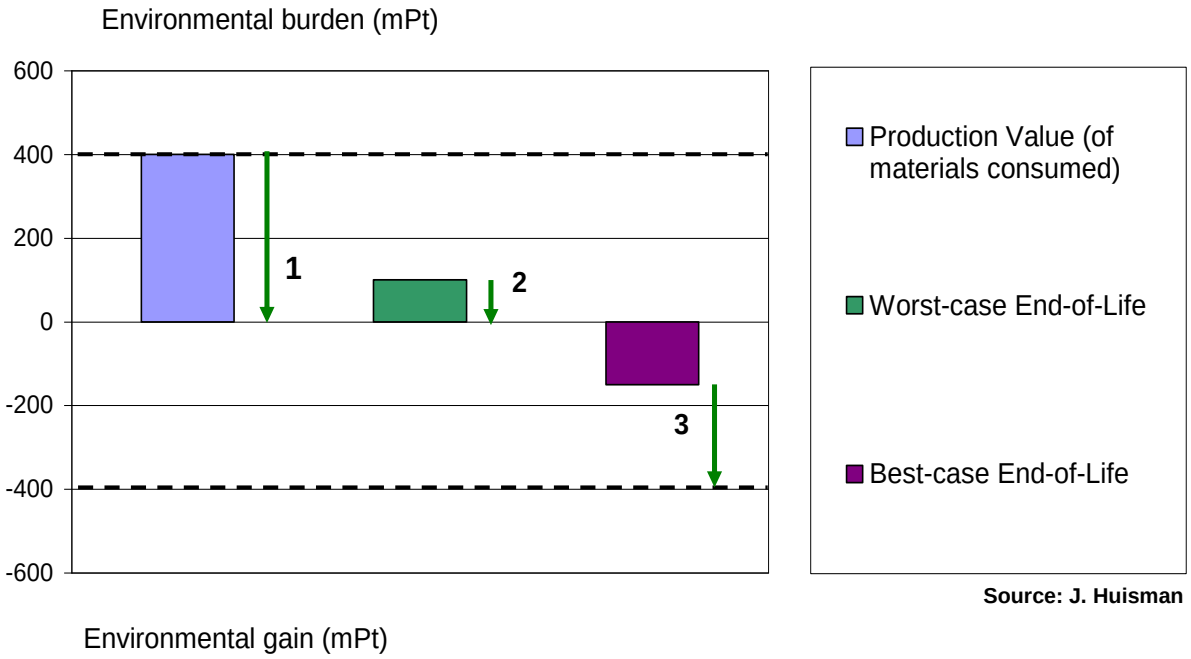


Done by OGS

Happening for OGS

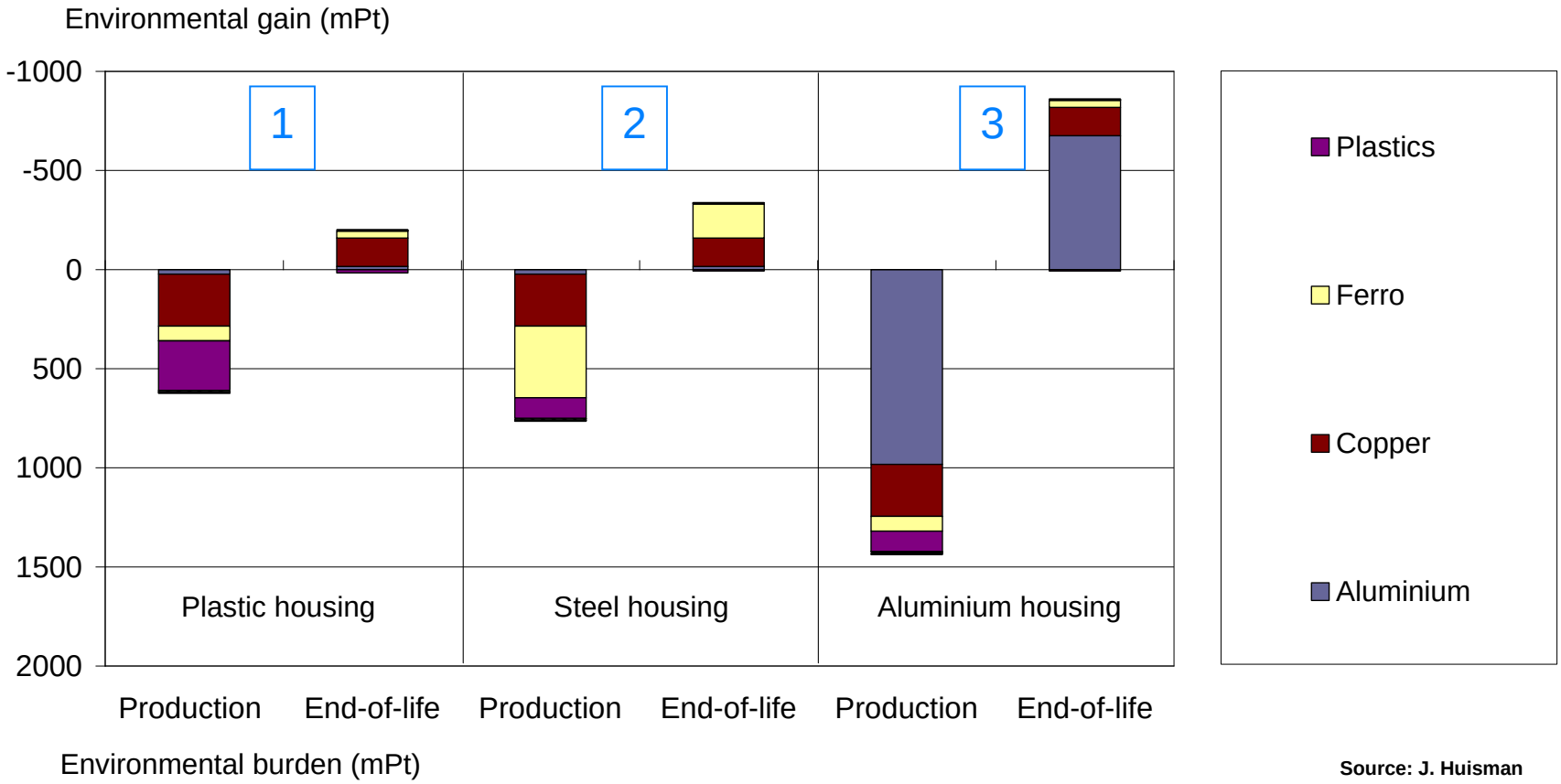
Where EcoDesign could play a role?

- Improving EoL performances of Electronic product:
  - Decrease the “value” of materials in manufacturing stage
  - Minimize worst case scenario (landfilling & toxicity control)
  - Maximize environmental value of fractions recovered (eco-efficiency)



Source: J. Huisman

Re-Design in Life-Cycle perspective



Source: J. Huisman

Focusing only on EoL: maximum environmental gain on 3

Life Cycle perspective need to be taken in account!!!

Perspectives & role for designers

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Product or Component	Presence of toxic/hazardous components	Relevant from resource management perspective	Relevant disposal costs	Main sources of potential revenues
SHS			Plastics, (with BFR)	Copper cables PWB control panels
Lamps	Mercury in CFL	Rare Earth in LED (mainly Y, Lu)	CFLs containing mercury	
PV modules	Cadmium and Tellurium	Gallium, Tellurium, Germanium and Indium	Eventually the Glass	Aluminium for larger frames
Batteries	Lead, Cadmium	Lead	Li-Phosphate, Ni-Cd	Lead, Li-Ion, Ni-MH

Design can play a crucial role, but not only..

Adventures in EcoDesign of Electronic Products

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Any questions?

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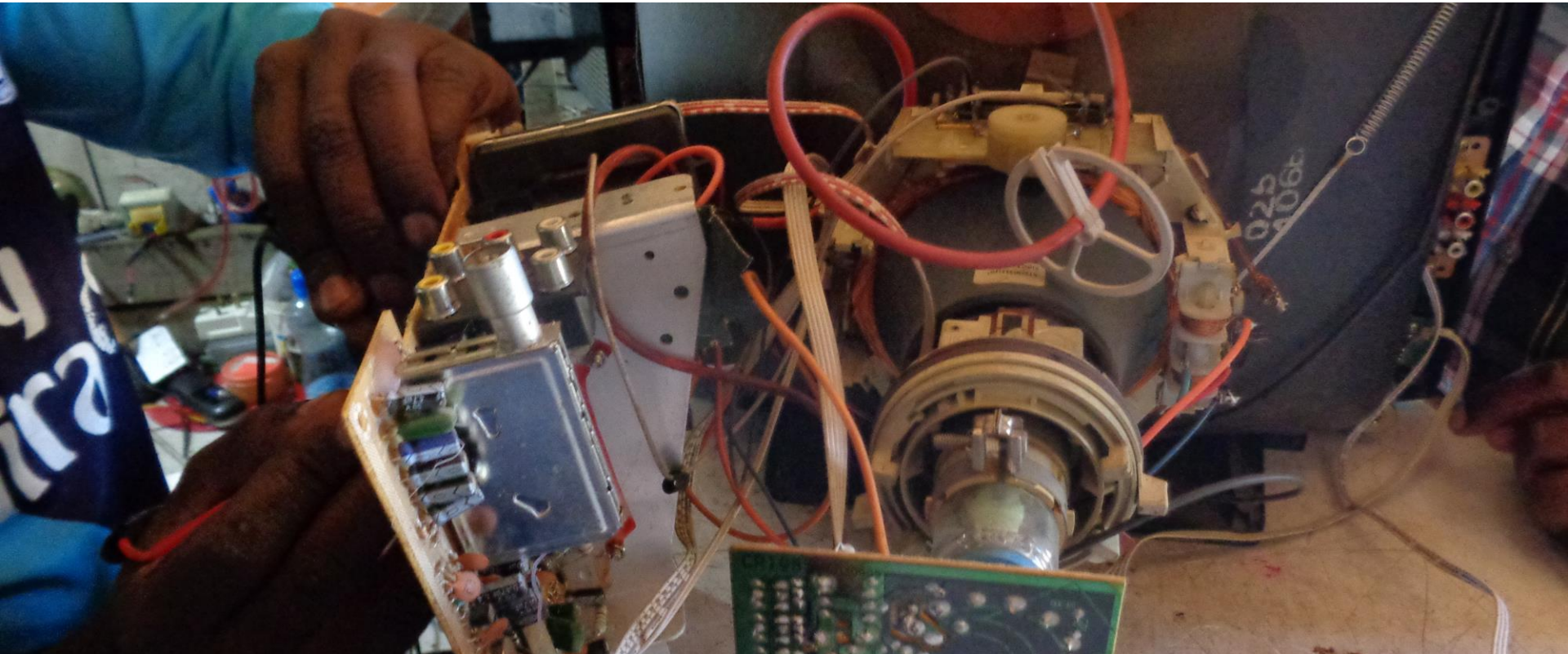
Product Lifecycle: Repairability

Dr Declan Murray
Independent consultant



The next 15 minutes…

- What is repair and why does it matter?
- Repair in your brief
- Repair in the judging criteria

What is repair?

And why does it matter?

What is repair?

And why does it matter?

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- Everyone does it:
  - hacking, *jugaad, bricolage,* DIY, fixing, mending, design
  - some things more than others:
    - cars ✓, vacuum cleaners X
  - some parts of the world more (affordably) than others
  - reconnecting, adding, removing, cleaning, using
- We've always done it
- Resource constraints, e-waste, manufacturing emissions, mining impacts
- Ownership and rights

Repair and your brief

Repair and your brief

- “a lack of access to energy and other basic services”
  - ≠ isolated or void of human and material resource
- “affordable”
  - now or over the long term?
- “super-efficient”
  - think about the energy of manufacture and shipping
- “improvements to *existing* appliances”
  - people have routines and attachment

Repair and the judging criteria

Repair and the judging criteria

- Innovation
  - whose innovation?
  - price of components
  - cost of production/assembly
  - materials used
- Social impact
  - “leave no one behind”
- Scalability
  - existing supply chains and distribution channels

Want to know more?

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Initiatives

- iFixIt – repair guides for electronics
- The Restart Project – do a great podcast and it's all on Spotify

Exemplar products

- Fairphone
- Gerrard Street – repairable headphones
- Solar What?! – recyclable, repairable, reusable solar lantern

Reading

- The Zimbabwe Bush Pump: Mechanics of a Fluid Technology – de Laet and Mol (2000)
- Caring for the "next billion" mobile handsets: opening proprietary closures through the work of repair – Houston and Jackson (2016)

Any questions?

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