WEEK 4

WHAT ARE SUSTAINABLE BUSINESS MODELS?

Managing Sustainability

BMA6105

Learning Outcomes

- Business Model Innovations
  - Technical models
    - Maximise material and energy efficiency
    - Create value from ‘waste’
    - Substitute with renewables and natural processes
  - Social models
    - Deliver functionality rather than ownership
    - Adopt a stewardship role
    - Encourage sufficiency
  - Organisational models
    - Re-purpose the business for society/environment
    - Develop scale-up solutions
- Governmental role in supporting sustainable models

Natural Capital: The next industrial revolution Chapter 1

Amory and Hunter Lovins

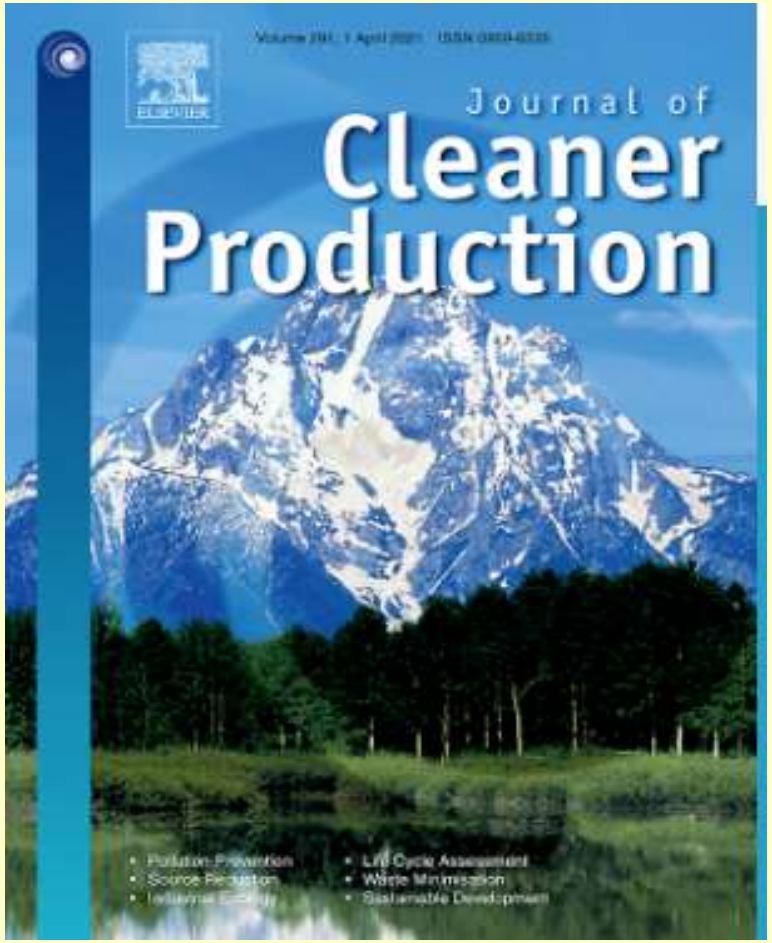
Imagine for a moment a world where cities have become peaceful and serene because cars and buses are whisper quiet, vehicles exhaust only water vapor, and parks and greenways have replaced unneeded urban freeways. OPEC has ceased to function because the price of oil has fallen to five dollars a barrel, but there are few buyers for it because cheaper and better ways now exist to get the services people once turned to oil to provide. Living standards for all people have dramatically improved, particularly for the poor and those in developing countries. Involuntary unemployment no longer exists, and income taxes have largely been eliminated. Houses, even low-income housing units, can pay part of their mortgage costs by the energy they *produce; there* are few if any active landfills; worldwide forest cover is increasing; dams are being dismantled; atmospheric CO2 levels are decreasing for the first time in two hundred years; and effluent water leaving factories is cleaner than the water coming into them. Industrialized countries have reduced resource use by 80 percent while improving the quality of life.

Paul Hawken

Hawken, P., Lovins, A.B. and Lovins, L.H., 1999. *Natural capitalism: The next industrial revolution*. Routledge.

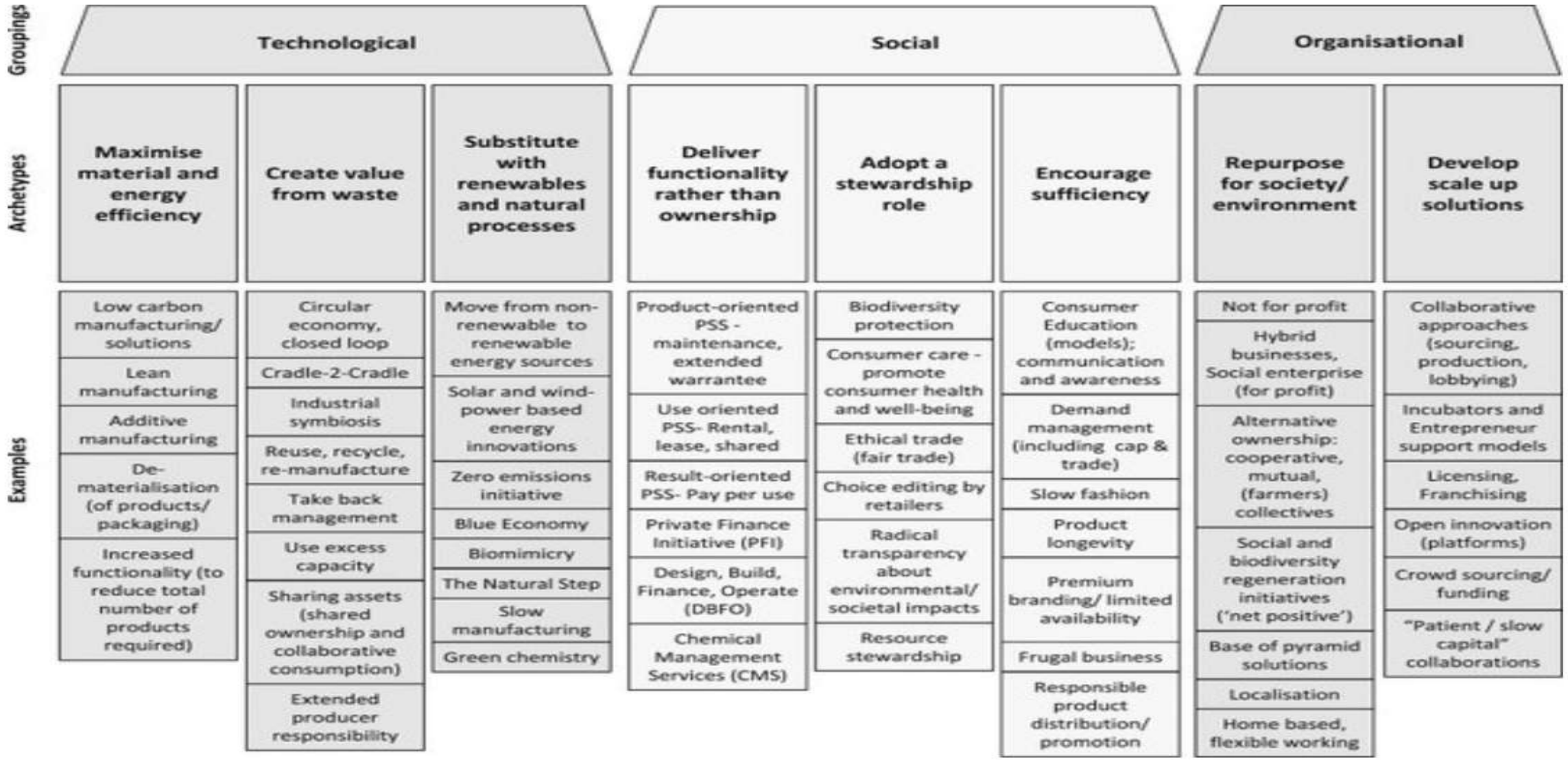
Sustainable business model ‘archetypes’

- Maximise material and energy efficiency;
- Create value from ‘waste’;
- Substitute with renewables and natural processes;
- Deliver functionality rather than ownership;
- Adopt a stewardship role;
- Encourage sufficiency;
- Re-purpose the business for society/environment;
- Develop scale-up solutions.



N. Bocken, et al. 2014. A literature and practice review to develop sustainable business model archetypes. *Journal of Cleaner Production*, 65, pp. 42-56

Range of sustainable business models



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Business model archetypes: Technical

- *Maximize material and energy efficiency*: such business models achieve more with fewer resources while generating less waste, emissions, and pollution (e.g., lean manufacturing)
  - Positive impacts: enhanced efficiency and resource use Potential cost savings
  - Negative side effects: business models often generate incremental change Potential rebound effects
- *Closing resource loops*: such business models aim to reduce material input by turning waste into resources (e.g., circular economy approaches)
  - Positive impacts: business models reduce waste by turning it into valuable input material Potential new revenue streams
  - Negative side effects: may lead to more material use due to potentially quicker sales cycles and sustained waste streams if waste is regarded as valuable
- *Substitute with renewables and natural processes*: such business models replace non-renewable with renewable resources (e.g., providers of clean renewable energy)
  - Positive impacts: business models reduce reliance on finite resources and contribute to overall green economy
  - Negative side effects: necessary products and processes might have significant negative footprint (e.g., lack of recyclability)

Business model archetypes: Social

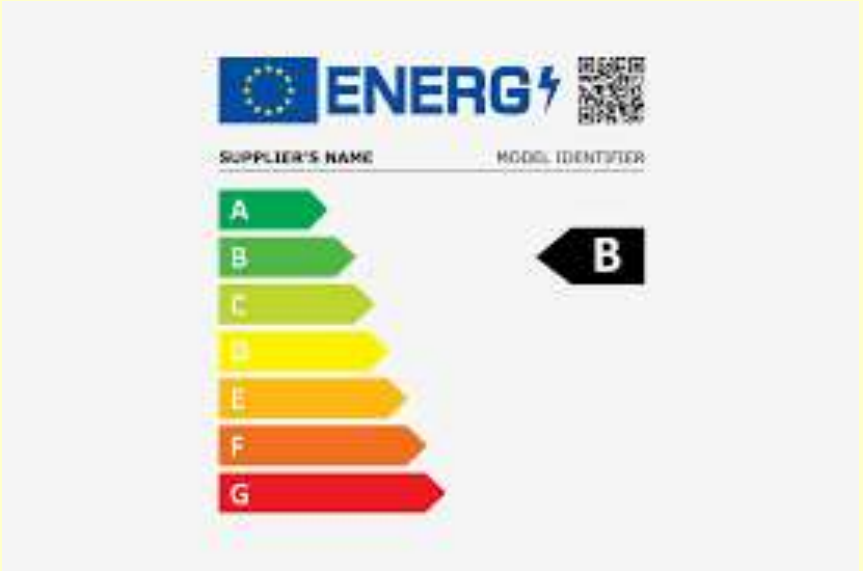
- *Deliver functionality not ownership*: such business models provide services instead of physical products to satisfy users' needs (e.g., various types of product-, use-, or result-oriented product service systems)
  - Positive impacts: can encourage more sustainable behavior of producers and consumers and reduce need for physical goods
  - Negative side effects: rebound effect when overall product use is increased (e.g., it is easier and less costly to use a product)
- *Adopt a stewardship role*: such business models engage with all stakeholders along the supply chain Ensure their well-being (e.g., certified products or processes such as Fairtrade)
  - Positive impacts: business models help to ensure long-term viability of supply chains and contribute to protecting the environment
  - Negative side effects: rebound effects might occur (e.g., psychological effects)
- *Encourage sufficiency*: such business models provide solutions to reduce consumption (e.g., slow fashion, collaborative consumption)
  - Positive impacts: business models actively reduce consumption and may lead to long-term customer relationships
  - Negative side effects: price premium of products which often confines them to niche market and difficult to scale because of consumer habits of buying products at a fast pace

Business model archetypes: Organisational

- *Repurpose for society/environment*: such business models seek to create social or environmental benefits beside being financially sustainable (e.g., social enterprises)
  - Positive impacts: such approaches can harmonize sustainability thinking with business motives Can deliver positive sustainable value to society and companies
  - Negative side effects: current market logics often do not favor such approaches
- *Develop sustainable scale-up solutions*: such business models deliver sustainable solutions on large scale to maximize sustainability benefits (e.g., collaborative approaches to scaling up such as open innovation platforms)
  - Positive impacts: approaches can potentially create change through scaling of sustainable solutions
  - Negative side effects: focus on scalability might detract from sustainability purposes and can lead to negative sustainability impacts

Efficiency improvement model: Energy Saving Companies (ESCOs)

- Offer services to reduce energy use
- Expertise in best available technologies
- Use conventional approaches (eg fleet management, light sensors to reduce electricity useage)
- Paid according to percentage of energy reduced, win-win incentives
- Opportunities extend beyond energy to MASCOs (materials) and WASCOs (water)



Danfoss

Efficiency and sufficiency model: B2B sharing platforms (FLOOW2)

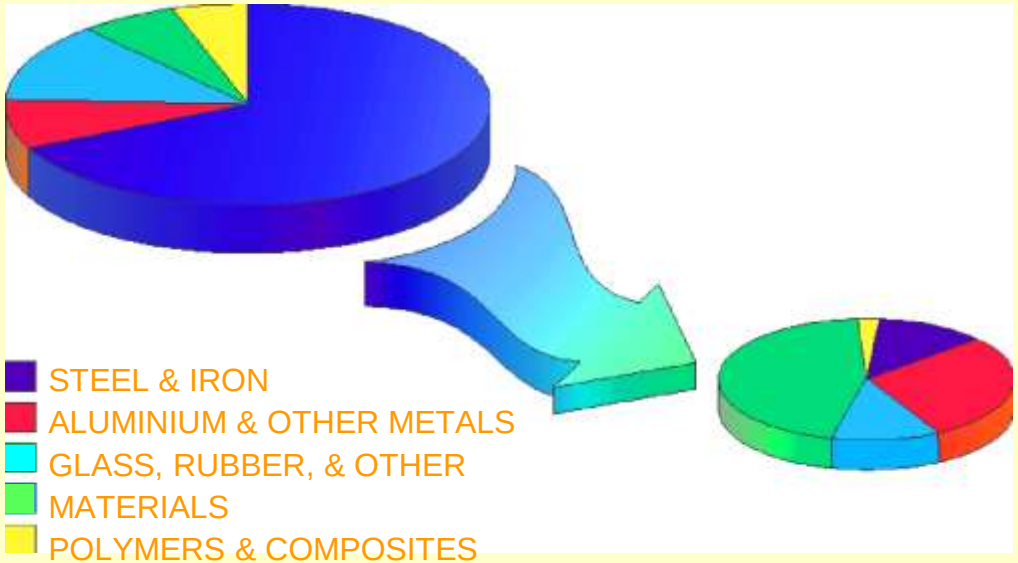
- Asset sharing platform
- Makes use of surplus/ redundant stock
- Owners offer surplus space and equipment for lease
- Earn income on dormant assets
- Leasees avoid costs of new purchases

- https://www.youtube.com/watch?v=pmHeUE4iPPk

Efficiency and sufficiency
Natural capitalism concept ‘Hypercar’

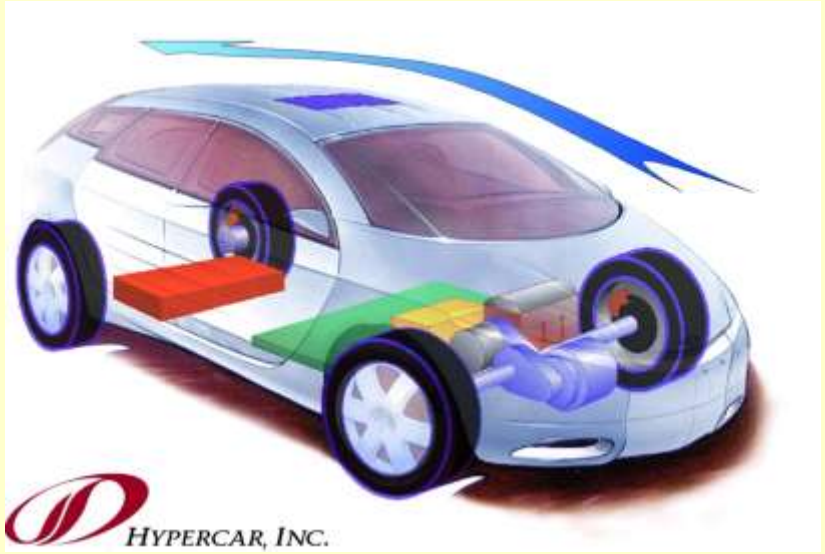
Hypercars represent a fundamental change from:

- metals to composites
- hard to soft tooling
- hardware to software
- liquid to gaseous fuel
- fully mechanical to hybrid-electric drive
- mechanicals/hydraulics to electronics
- complexity to radical simplicity



Efficiency and sufficiency
Natural capitalism concept ‘Hypercar’ (2)

- No body shop, no paint shop
- <30 body parts, each hand-liftable
- Self-aligning snap-together glue-joints
- Direct-hydrogen fuel cell — no engine, clutch, transmission, driveshaft, axles, differentials, starter, alternator
- Modular plant scales down flexibly
- Capital needs ~1/10 normal; modular pace
- Permits diverse, rapidly evolving model portfolio with very low breakeven volume and low financial risk per model
- Direct-sales model eliminates markup



Waste value model
Biological waste recovery (Biobean)

- The world's largest processor of used coffee
- Convert used coffee grounds into fire logs
- Collect waste grounds from coffee shops (previously landfilled)
- Grounds contain high calorific value
- Coffee beans grow on an annual cycle, in circling carbon from atmosphere to bean

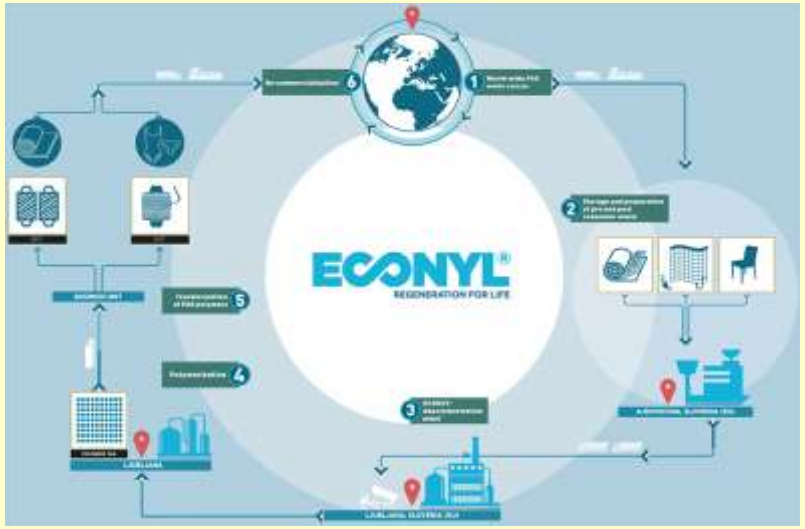
bio-bean
powered by coffee

Waste value and sufficiency model
Reverse supply chain (Mazuma Mobile)

- Obsolete products due to new consumer purchases
- High turnover, fast moving technology
- Large secondary market for working phones; some components still harvestable from faulty phones
- Postal collection of useable phones
- Re-sale to developing markets,
- Sales now exceeding £100 million
- https://www.youtube.com/watch?v=Nl1NlDvEZ_8

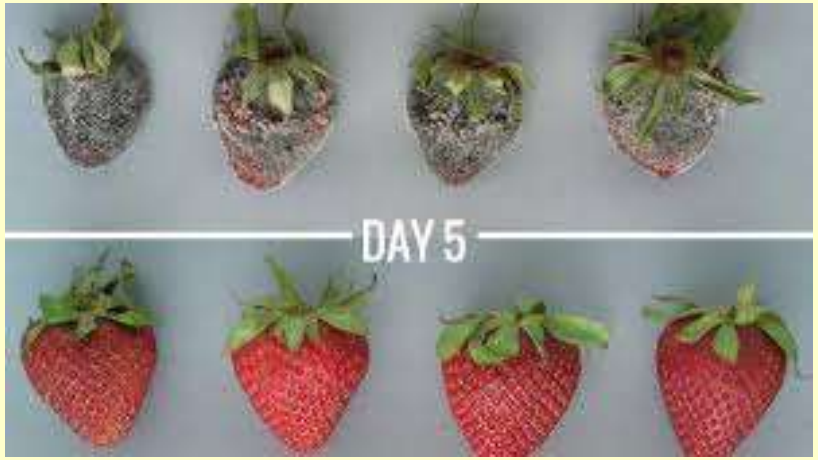
Waste value and stewardship model
Reuse and Recovery (Econyl, by Aquafil)

- Nylon sourced from discarded fishing nets, avoiding landfill and reducing risks from waste nets
- Recycled nylon is composed of 100% recycled material, eliminating the need to add any new fibre
- The recycled nylon retains 100% quality characteristics of the original product



Dematerialisation and natural substitution model:
Package-less packaging (Apeel)

- Seals fruit and vegetables with food grade transparent film derived from natural plant cellulose and proteins
- Prevents evaporation/drying out and shuts out oxygen
- Extends shelf life by two to three times for fruit with natural peel
- ASDA piloting Apeel with clementines



Material substitution model: ‘Meat-less’ meat (Impossible Foods)

- Red meat is a significant emitter of greenhouse gases (both methane and CO2)
- Increasing meat consumption is correlated with rising incomes
- Impossible Foods ‘Bleeding Burger’
  - Research investment over $80 million
  - Uses 95% less land and around 75% less water than traditional burgers
  - Made from water and plant-based sources (textured wheat protein, coconut oil and potato protein)
  - Emissions are 87% lower than equivalent meat products
  - Pioneering plant based liquid to give juiciness, texture and flavour

Waste value and natural substitution model
Biological packaging solutions (Ecovative)

- Biological waste combines with mycelium-based growth matrix
- Product characteristics exceed styrofoam
- Scalable, dispersed production
- Inverse facilities:
  - every warehouse houses 10,000 manufacturing hubs
- At-home kit: manufacture your own products
- Infinitely recyclable

Efficiency and Product-as-service model: Lighting solutions (Philips Lighting)

- Product as service
- ‘Pay per lux’
- Upgrading and replacement for free
- Maintenance contract
- Profit margin on efficiency gains
- Long term relationships

‘I told Philips, ‘Listen, I need so many hours of light in my premises every year. If you think you need a lamp, or electricity, or whatever – that’s fine. But I want nothing to do with it. I’m not interested in the product, just the performance. I want to buy light, and nothing else.’ Thomas Rau, RauArchitects

Product-as-Service model: Clothes washing services (Bundles)

- Clothes washing service
- Lease the washing machine
- Internet enabled pay-per-wash
- Economic gain for leaser and leasee
- Highest quality Miele machine

https://www.youtube.com/watch?v=oQPA1aW4RYs

Stewardship and product-as-service model
Closed loop flooring services (DESSO)

- Flooring services: labour > materials
- Replacement of roll with individual tiles
- Service heavy use areas with new tiles (<10%)
- Retain ownership of flooring materials
- Redesign of tile components
- Enable separation of component fibres
- Creation of material supply from waste
- Leasee ‘stores’ company property for it

https://www.youtube.com/watch?v=ZHGxf_ztiDg

Efficiency, substitution and product-service model: Hydrogen fuel cell vehicles (Riversimple)

- Low power fuel cell (equivalent to lawnmower)
- Lightweight carbon chassis
- Conventional mechanical/electrical components
- Leasehold ownership model

- https://www.youtube.com/watch?v=VDjfMKXKhQk
- https://www.youtube.com/watch?v=ujcFE6Z8f0A

Stewardship and sufficiency model: Product life extension (Caterpillar)

- Retain and refurbish model
- Design for replacement/repair
- Supply chain control
- Protection of proprietory material and quality reputation

Sufficiency and stewardship model
Consumer refill (in-store, online)

- Originally pioneered by The Body Shop.
- Replacing packaging with customer refills
- M&S trial in 2019
  - 25 of the 44 lines outsold their pre-packaged counterparts.
  - Across all 44 lines, more than 2600kg of loose product was sold over a three-month period.
- Waitrose experimenting with ‘Unpacked’ counters covering up to 200 products (including unwrapped foods and refill toiletries)
- The Body Shop has installed a new refill dispenser in its Oxford store.

Socially purposive business model: Grameen Bank Microfinance

- Model innovation in banking system and services
- Focuses on poorest strata
- Specialises in unsecured loans obtained with no collateral
- Loans made to community groups who ensure discipline on repayments by group members
- Very low default rates

GRAMEEN
Banking for the poor

Socially purposive and energy substitution model
SELCO – Solar Energy

- Household solar system installer
- Focusing on low income family dwellings
- Replacing kerosene lamps with 35 W PV panels linked to 7W compact fluorescent lights
- Locally sourced panels
- Installation costs Rs 18000; daily incomes Rs 400 (£5)
- Lease contracts to spread costs over 5 years
- Initial government subsidies of 33% to reduce costs

SELCO

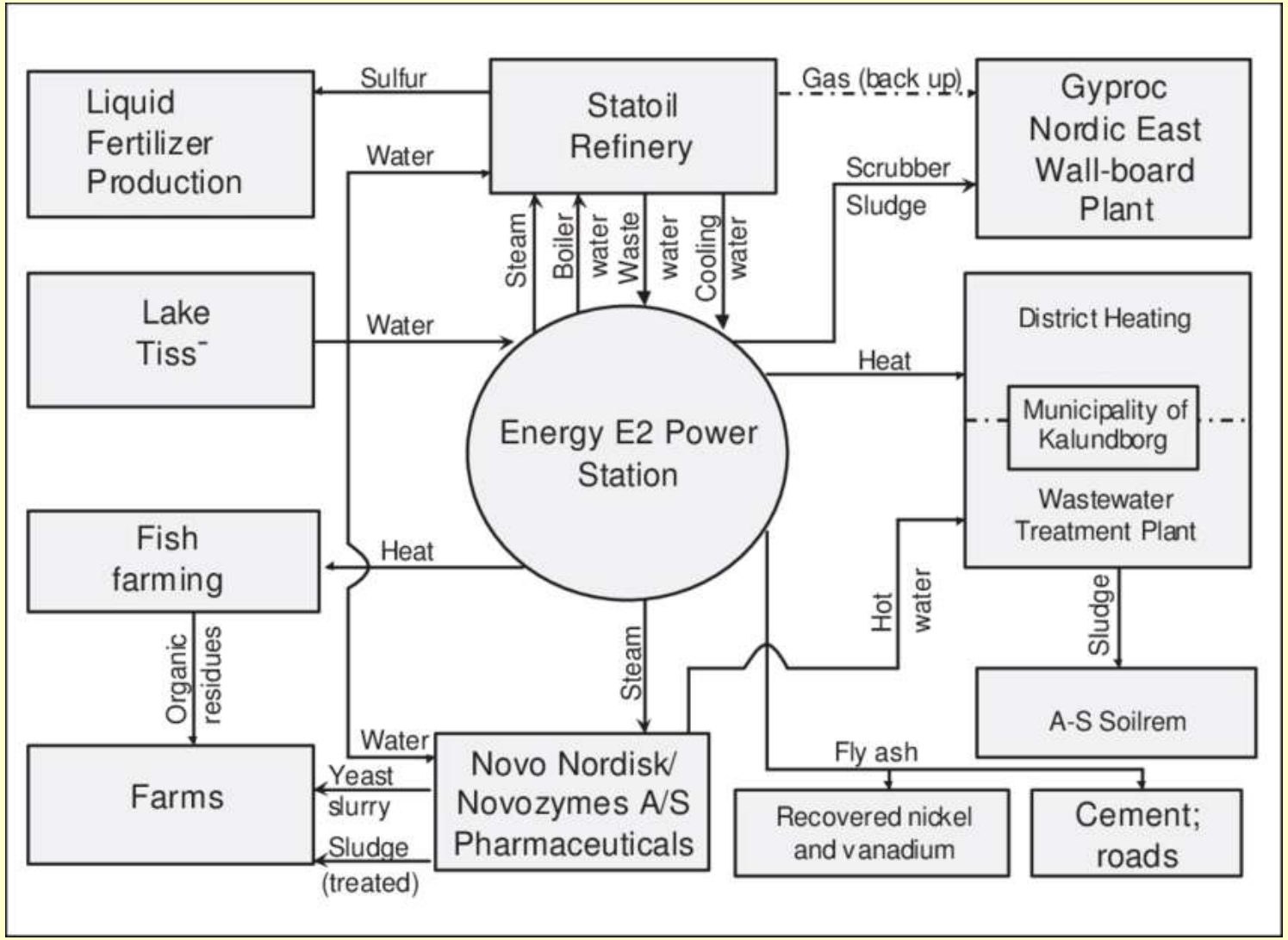
Socially and environmental purposive model: Tourism (CAMPFIRE Zimbabwe)

- Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) programme
- Payment for ecosystem services
- Channel income from eco-tourism through to local communities
- Manage tensions between subsistence agriculture and wildlife hunting
- District councils given authority and control over wildlife management
- Income from tourism distributed to affected communities

System efficiency and waste value model Industrial Symbiosis: (Kalundborg, Denmark)

Integrated production facilities:

- Energy exchange
- Materials exchange



Governmental involvement in sustainable models

- Innovative model incentive systems
  - Cap and trade
  - Taxes
  - Grants and subsidies
- Supportive regulatory change
  - Sourcing
  - Disposal
- Public procurement requirements
- Infrastructure investment (eg.cycle paths)

Summary

Business model innovation opportunities for sustainability:

- Maximise material and energy efficiency
- Create value from ‘waste’
- Substitute with renewables and natural processes
- Deliver functionality rather than ownership
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- Re-purpose the business for society/environment
- Develop scale-up solutions