Sustainable mobility as a 'cultural' challenge

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Schumacher (1973)

There is no substitute for energy. The whole edifice of modern society is built upon it….it is not 'just another commodity' but the precondition of all commodities, a basic factor equal with air, water, and earth

Globalisation and fast travel

- 1800 people in the US travelled 50 metres a day –now travel 50 kilometres a day - world citizens move 23 billion kilometres; by 2050 with business as usual that will increase to 106 billion
- the growth of automobility throughout the world increasingly in the world's two most populous societies of China and India.
- the rapid growth of cheap air travel based on new budget business models.
- high speed trains across Europe and Japan
- new globally significant themed leisure environments visited from afar
- increased 'miles' both flown and travelling on the world's 50,000 ships by manufactured goods, components and foodstuffs
- used up half the world's conventional oil during the mobile C20th according to the IEA with global oil supply peaking in 2006 – HSBC's Chief Economist 'there could be as little as 49 years of oil left'. Tough oil....

Locked into oil

Oil provides almost all transportation energy in the modern world (at least 95%) - it uniquely makes possible mobile lives including collegial, family and friendship miles

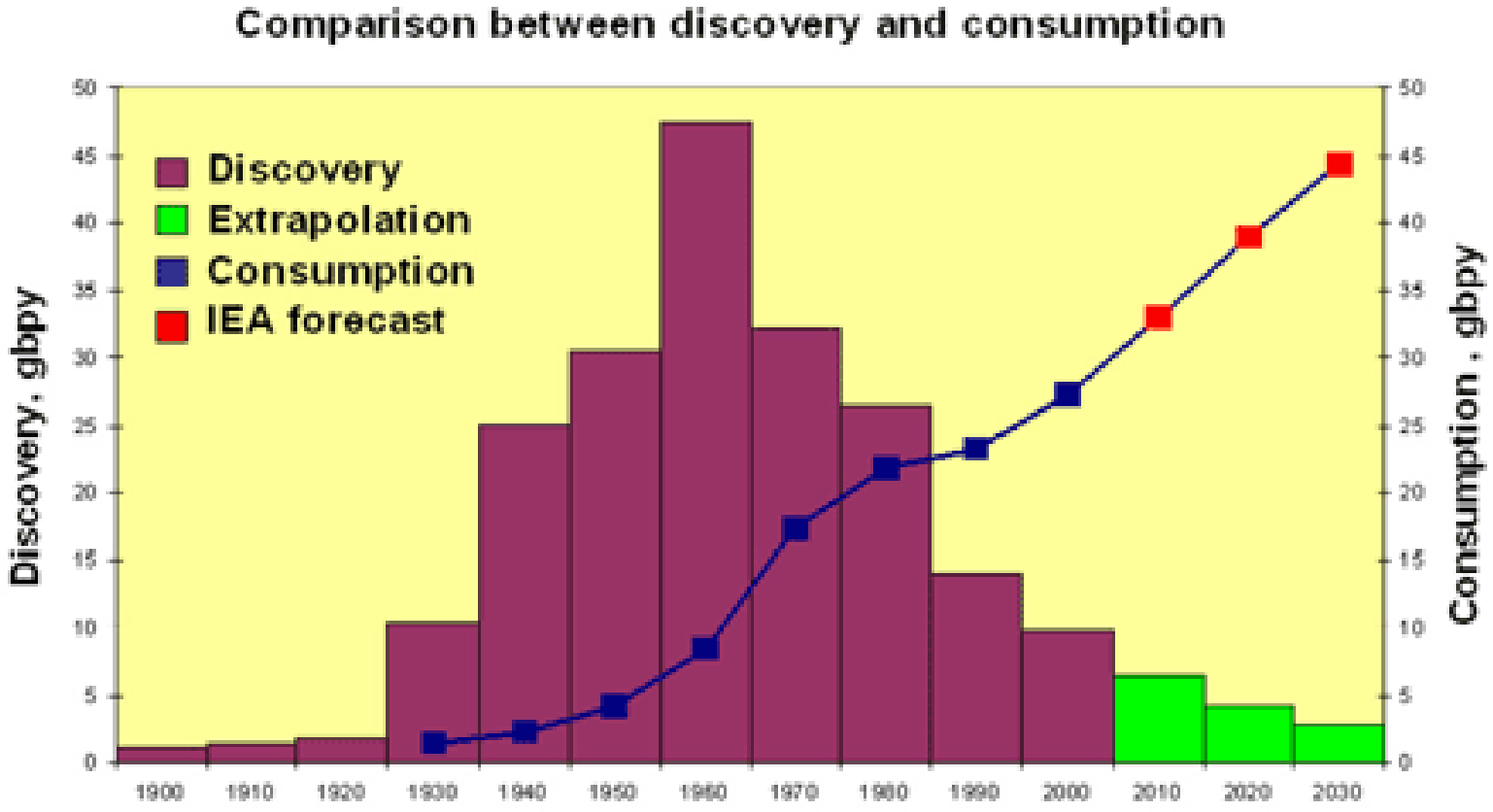
Fuels the world's ships that transport components, commodities and food on a global scale

Is an element of most manufactured goods (95%)

Is crucial to at least 95% of food production for a rising world population through irrigation, transport, pesticides, fertilisers

Is crucial in providing back-up power and lighting

Peak oil?


Comparison between discovery and consumption
Discovery
Extrapolation
Consumption
IEA forecast
Discovery, gbpy
Consumption , gbpy
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Climate change

- almost certain increases of temperatures above 2° - and higher at the north and south poles
- 20% risk of more than a 5°C increase in temperatures
- many threats to infrastructures especially near coasts
- IPCC models do not factor in some possible positive feedback loops
- transformation of the world's physical and human geography through a 5-20% reduction in world consumption levels and the capabilities of life especially between the two Tropics
- reductions in the overall population worldwide
- systems are like a 'juggernaut' careering at full pace to the edge of the cliff

‘Human behaviour’

The sciences of climate change make it clear that ‘human behaviour’ is central to ‘global warming’. Those sciences reveal how climate change is too important to be left to the sciences!

Climate change is not a purely ‘scientific’ problem - human actions are wholly complicit within the apparent warming of the planet.

Such warming will only be slowed down or reduced if ‘humans’ around the world behave very differently.

But economists are viewed as being best able to examine these ‘human’ dimensions. See S*tern Review* - but in its later sections social customs enter the analysis but are viewed as not being fully explicable by ‘economics’. So what are some alternative ideas here?

Limits of economics

First, economic institutions are important often because of their social and political consequences. Large global corporations have huge interests in the 'business as usual' of *'carbon capitalism'.*

Second, economists regard *energy* as generating about 5% of the GDP of an economy because this is roughly what it costs. But carbon–based energy is a unique bundle of non-renewable commodities. Energy is not any commodity.

Third, most of the time people do not behave as individually rational economic consumers. People are creatures of social *habituation*. And habits can spread within a society through media and advertising. These habits become widespread and embodied 'social practices' which are hard to reverse

Fourth, changes in habits do occur and they can occur *rapidly*, such as mobile telephony. Fixed routines may pass thresholds and turn into their opposite.

Fifth, low carbon systems and lives will only become significant if they become matters of new *fashion* ultimately spreading on a global scale – hence a matter of 'changing cultures'

Habits and systems

- Habits derive from systems lying outside ‘individuals’
- There is no tendency for systems to move towards equilibrium
- Systems significant in the contemporary world are simultaneously economic, physical, technological, political and social – sociotechnical
- There is increased linking of system components through software, cybernetic architecture and networking
- There is an unpredictability of systems with ‘non-linear’ relations between ‘causes’ and ‘effects’
- Systems once established can get ‘locked in’ over decades in relationship to each other
- Systems are clustered
- Habits are elements of social practices

Examples of high carbon social practices

- Overseas holidays
- Driving to the shops
- Showering daily
- The school run
- Drinking foreign beers/wines
- Second homes
- Climate control rather than clothing control
- Driving through well lit streets
- Dining out rather than in the home/collective canteens
- Global friendships
- Working on projects with a global team

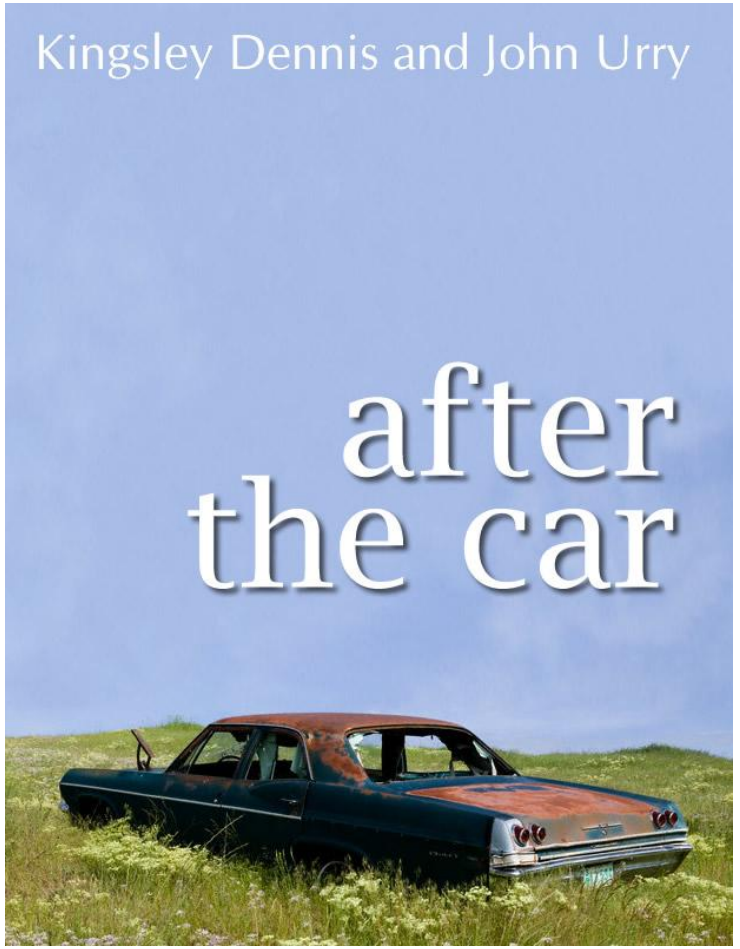
Finding reverse gear

Moving to a low carbon economy-and-society involves 'reversing' most systems/practices/habits set in motion during the C20th. Such a reversal comes up against:

1. **systemic carbon interests who themselves are causing the rising GHG emissions – a wicked problem**
2. **the long term path dependencies of existing systems including routines**
3. **the ways that low carbon will reduce short term levels of income and consumption**
4. **the difficulty of orchestrating a global polity to reset global agendas**
5. **general slowness of societal change – the enduring late C19 car system**
6. **states are rarely able to bring about change from the top partly because of resistance and opposition**
7. **lack of time available to make a seismic shift or system reversal since the atmospheric changes are already 'in the system'**
8. **the need to change multiple systems simultaneously to generate a new low carbon *cluster***

Buckminster Fuller

‘You never change anything by fighting the existing reality. To change something, build a new model that makes the existing model obsolete’.



Futures

- central to many future scenarios are various new technologies and of their presumed transforming impacts.
- it is important to resist a technology-first analysis since technologies do not just develop for endogenous reasons
- nor do they then simply transform the economic and social landscape in their own image once developed
- technologies are always to be seen as heavily embedded within forms of economic, social and political life.
- they depend upon business *and* sociological models
- innovation is a matter of synchronisation across many different social, economic and political entities
- it is systems that have to change

Automobility system

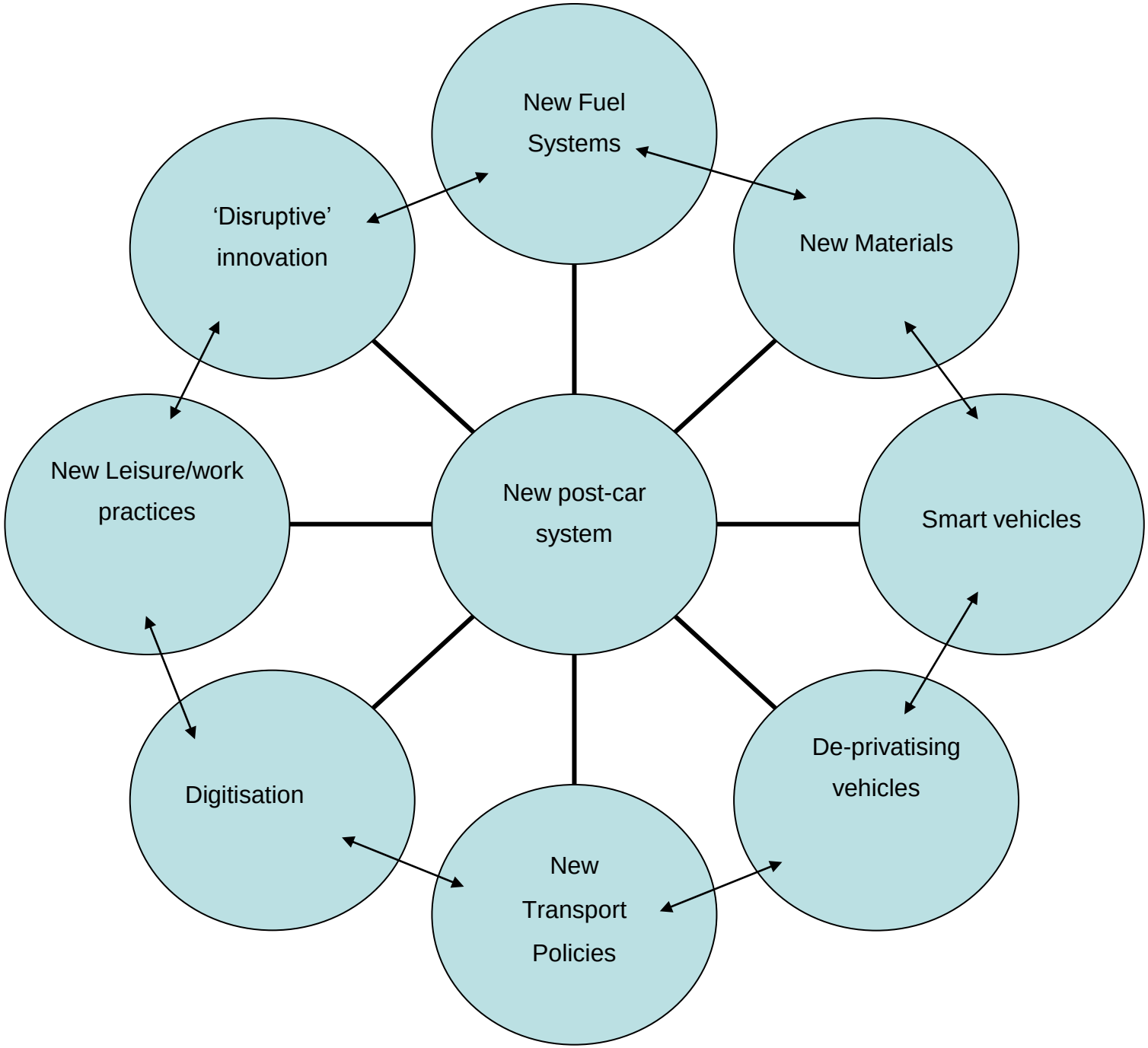
Automobility changes the environment or fitness landscape for all other existing and future systems. It has achieved this by :

- **adapting as it spreads along the paths and roads of each city**
- **drawing in many aspects of its environment which are then reconstituted as components of its system,**
- **being central to and locked in with the leading economic sectors and social patterns of twentieth century 'carbon capitalism'**
- **promoting the notion of convenience rather than speed**
- **seemingly providing the solution to the problems of congestion that it itself generates**
- **being able to externalise dangers onto those outside the system as it provides enhanced security for those 'within'**
- **being central to the individualist, consumerist affective culture of contemporary capitalism**

Changing automobility is not a question of individual behaviour but of systems changing and practices changing

A new system?

- **shifts in transport *policy* in cities away from predict and provide**
- **new *fuel systems* for cars, vans and buses**
- ***new materials* for constructing 'car' bodies**
- ***smart* vehicles**
- ***deprivatise* cars through city-wide car-sharing, cooperative car clubs and smart car-hire schemes**
- **'smart-card' *technology* to transfer information from car to home, to bus, to train, to workplace, to web site, to bank.**
- **new *social* practices**
- ***disruptive* innovation**


New Fuel Systems
'Disruptive' innovation
New Materials
New Leisure/work practices
New post-car system
Smart vehicles
Digitisation
De-privatising vehicles
New Transport Policies

Post car system

- multiple, dense forms of movement mainly of small, ultra-light, smart, deprivatised ‘vehicles’
- flexibilised travelling accessing small, light mobile pods as and when required
- electronic regulators embedded in lampposts and in vehicles to regulate access, organise price and control vehicle speed.
- some vehicles would be driverless
- vehicles would be electronically and physically integrated with other forms of longer range collective mobility
- electronic coordination between motorised and non-motorised transport
- smart ‘cards’ would control access to and pay for people’s use of the various forms of mobility
- software systems ‘intelligently’ work out the best means of doing tasks, meeting up or getting to some place or event
- some rationing of carbon

Electric vehicles
Royal Academy of Engineering Report 2010

- **Personal vehicle decline**
- **Competition**
- **Complementarity**
- **System substitution**