

Beyond Peak Oil: Will Our Cities Collapse?

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- oil fields inevitably decline in their production
- once a well is past its peak, the remaining oil is more difficult to extract and requires greater energy inputs to retrieve remaining oil
- eventually the well is abandoned
- once a nation peaks, its economics and politics must shift as it has to begin importing its oil needs
- M.K. Hubbert's 1956 suggestion that the U.S. would peak in its production was met with derision, but it occurred² nonetheless and the U.S. had to begin importing oil
- global oil discoveries peaked during the 1960s and enormous efforts have been made to find and extract more despite depleting reserves
- reserves are growing at a much slower rate than current consumption bringing a peak in global production ever closer
- estimates of when this may occur vary with most clustering around the early part of this century
- C.J. Campbell has stated that regardless of a precise date, "The real point is not so much the exact date of peak but the statement that the First Half of the Oil Age, which was characterized by growing production, is about to be followed by the Second Half when oil production is set to decline along with all that depends upon it. On that at least we can stand firm." (p. 16)
- statistics provided by oil companies on how long supplies will last are usually based upon present consumption (typically 30-40 years)
- these projections mislead once peak has been passed as post-peak production tends to be more difficult and costly (both financially and energy-wise)³
- supply is destined to be constrained by physical capacity and new players in the market
- during the 1973 Oil Crisis, Hubbert stated that while the current situation seemed difficult, the real test would come in the early part of this century when peak was encountered
- economists tend to default to a market-based response where supply and demand will lead to change
- to this, BP Exploration Manager Riechard Miller has argued that higher prices will not 'solve' our dilemma of declining conventional oil and "We can't mine the oil sands in sufficient quantity because there isn't enough water to process them. We can't grow bio-fuels because there would be no land left to grow food. Solar, hydro, wind, and geothermal don't yield enough energy, hydrogen (from water) takes more energy to make than it can yield..." (p. 17)
- investment banker Matthew Simmons states he has no doubt about the severity of the approaching consequences and is amazed at the limited knowledge about the issue even by

¹ The focus of this paper is basically 'the **right** technology can solve Peak Oil consequences' should not be surprising given the audience that the journal publishes for. The focus is primarily upon sustaining economic growth via 'smart' planning and technology.

² 'Conventional' oil production peaked, since this event U.S. production has hit new highs with 'unconventional' sources—especially shale.

³ Also, these company statistics don't account for demand growth due to expanding economies and population increase—including migrants from low-consumption regions to higher ones and developing nations consuming more.

senior managers within oil and gas companies; and although predicting when things will occur cannot be accurate, they will happen; peak can only be seen in a rear-view mirror and when recognised chasing adequate alternatives will be too late: "If I am right, the unforeseen consequences are devastating. The facts are too serious to ignore." (p. 18)

-a 2005 Hirsh et al. report for the U.S. Department of Energy emphasised similar warnings: "Without massive mitigation more than a decade before the fact, the problem will be pervasive and will not be temporary. Previous energy transitions were gradual and evolutionary. Oil peaking will be abrupt and revolutionary."

-others argue that more than a decade is necessary and that we are already well behind schedule

-despite this, ignorance and denial abound

-oil companies fear the impact on their stock prices, governments don't want to cause panic, and most others just don't want to consider the implications

City Futures

-cheap oil has helped urban centres grow

-how cities might manage declining oil availability is an unknown

-while studies for future development recognise a need to reduce vehicles to save on oil⁴, no other behavioural changes have been explored with assumptions tilted towards continued population and economic growth—growth that Peak Oil puts in serious doubt

-the author puts forward four possible scenarios as to what may occur in cities as a consequence

Collapse

-many predict an apocalyptic future; for example, U.S. Senator Roscoe Bartlett says of Peak Oil that it will bring an end to civilisation as we know it, while others speak of a massive die-off

-collapse is possible, particularly in light of pre/historical examples

-advanced-economy cities require massive amounts of oil; however, some developing economy cities rely upon very little and may adapt to a world of less quite easily

The Ruralised City

-some believe that the residents of cities will mostly disperse leading to a sustainable semi-rural society where most will grow their own food

-permaculture villages and suburban agriculture are envisioned for our future

-population decline is a necessary for such a scenario given the lack of arable lands for the needed food production

-as the author states, "the 'Killing Fields' would be a playground in comparison" (p. 20) but does not believe this future is likely given that the past shows urban centres being eventually rebuilt and not transitioning to a rural Eden

⁴ Although this has shifted in the past few years for some to no need to reduce vehicles since everyone will be driving electric vehicles.

- urbanites do not want to return to a time when they were responsible for their own food production, that is why they moved to a city: the opportunity to do things other than farm⁵
- a new kind of city and food production system may need to arise for we are unlikely to alter millennia of urban history
- urban technologies and lifestyles will need to adapt in a more sustainable fashion; if we fail, collapse is likely
- food production and mineral/material extraction could continue but without oil
- Diamond argues that it is our adaptability to physical limits that is the test of civilisation

The Divided City

- this scenario sees 'advantaged' residents living in an electrified core where those on the outside get increasingly poor (with gangs fighting over resources)
- the author suggests that there are increasing signs of this possibility emerging

The Resilient, Sustainable, Solar City

- this is the scenario the author argues we should be striving for: an electrified city for all

What Must Be Done?

Take the Threat Seriously—Create Peak Oil Strategies

- the author suggests that the United Nations should take the lead in setting goals on how to wean the world economy off of oil
- cities/states need to create strategies to deal with Peak Oil
- Western Australia, for example, "has a State Sustainability Strategy that includes a position on Oil Vulnerability, the Gas Transition, and the Hydrogen Economy" (pp. 21-22); one approach has been to trial hydrogen fuel cell buses and revamping their electric rail system in an attempt to help transition away from oil
- the cities of Portland (U.S.) and Brisbane (Australia) have created Peak Oil plans⁶

Plan and Build Cities With Reduced Car Dependence

- cities existed prior to oil and thus they could transition to a future where its not necessary
- it is car dependence that drives oil vulnerability and cities need to be built without car dependence
- transportation infrastructure and land-use policies must be rethought so that car use is reduced
- in Australia, residents in central parts of cities exhibit low fuel consumption with public transport options, along with dense populations and mixed land use; these areas will adapt well to peak oil⁷
- suburbs, however, that are car-centred have very high fuel consumption

⁵ I would argue that this is a relatively 'recent' phenomena as past collapses do show urban residents mostly dispersing; more modern responses are for very different reasons than the author suggests—most of us have lost the skills/knowledge to feed oneself and survive without modernity's complexities.

⁶ These plans appear to be focussed upon sustaining what is increasingly looking to be unsustainable, being quite blind to a number of issues.

⁷ I sense a significant blindness to the impacts of declining hydrocarbon availability; e.g., agriculture, supply chains, building materials, shipping/trucking, etc..

- issues of equity may be at play here as city centres tend to be occupied by the wealthy with the poor on the fringes (e.g., outer-area households tend to spend 40+% of their income on travel to/from jobs and services)
- extending electric rail lines can help address this imbalance, along with local buses⁸
- an Australian House of Representatives Report on Sustainable Cities (2005) recommended such an approach for middle and outer suburbs
- Perth has implemented a new rail system and rationalised it as a response to Peak Oil, but much of the city is still vulnerable
- urban planners are recognising the need to build around rail lines, making cities denser and leaving rural areas
- "Getting serious about oil depletion means that rural lifestyles on the edge of the city cannot be facilitated and subsidized as they have been. There is a real clash between those who want to ruralize cities and those who realize the problems this creates in car dependence." (p. 23)
- creating local ecovillages that are increasingly self-reliant should still be tried but not if they are an excuse to extend cities into rural lands

Rebuild Peri-Urban Agriculture

- the impact of Peak Oil on agriculture will be significant given its dependence on diesel
- good farmland is being lost to suburban sprawl and needs to stop, especially given the high fuel consumption required to support it
- the countryside needs to be more rural and the cities more urban
- 'Horticultural Precincts' should be established next to cities
- "Agriculture will need to adapt by growing its own biodiesel, using gas, and switching to more efficient rail transport rather than trucks. This transition will need assistance and subsidized diesel is not helping. A crash program in diesel phase-out could change peri-urban agricultural oil vulnerability in five years." (p. 24)
- food production needs to be local as much as possible with bulk commodities (e.g., wheat) supplied by rail or ship at little or no oil cost
- bioregional surpluses should be pursued for trade purposes

Facilitate Localism

- a post-Peak Oil world will by necessity be local, but trade beyond the local area will continue
- the first trade beyond local regions may have begun 4000 years ago, long before modern oil-based transportation
- some of modernity (e.g., internet) may not be abandoned easily, but we need to push localism and innovation in this area should be funded—especially new urban technologies that "create distributed energy and water infra-structure (involving less energy for distribution and pumping), localized industrial ecology of businesses that can share their wastes as resources or work together to ensure local resources are used and re-used" (p. 25)

Regulate for the Post-Oil Transition

- oil consumption is subsidised extensively through a variety of regulations

⁸ Here we see the 'more mass-produced industrial products' being proposed as the 'solution' to resource decline rather than reconsideration of the 'industrial technology as solution' mythology.

- regulations should be implemented to reduce ICE vehicular use and increase that of hybrids
- the number of vehicles or distance driven would not have to be reduced, but the gas consumption could be significantly lowered
- investment in wind farms across the country could cheaply charge the batteries for those vehicles
- regulations are necessary to guide the transition away from oil
- there appears to be no oil alternatives for aviation so increasing prices to reduce unnecessary travel may be needed

Prepare Risk Management Scenarios for the Future

- there seem to be no scenarios laid out for advanced economies to deal with oil vulnerability
- analysts need to take the issue seriously and create various scenarios for a reduction in oil supplies
- considering a shift to a Hydrogen Economy is one example
- we must consider what steps are needed to get to a future without oil
- "A new urban world is emerging where we must adapt to using less and using different technology or our vulnerability to oil will be exposed.' (p. 27)