BASELINE SCENARIO. BUILDING BLOCKS FOR LONG-TERM PREFERRED FUTURES

THERE IS A LOT OF INERTIA AND IRREVERSIBILITY BUILT INTO FACTORS SUCH AS POPULATION, TECHNOLOGY, ECONOMIC GROWTH AND MINDSETS. TO SHOW WHY THE COURSE WE ARE ON IS UNSUSTAINABLE, YET IRREVERSIBLE – WE CANNOT GO ON, AND WE CANNOT GO BACK – IT IS USEFUL TO LOOK AT A BASELINE SCENARIO AS A POINT OF DEPARTURE FOR HOW WE CAN MOVE FORWARD.

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One of the aims of the project "In100Y" is to consider and create ideas for futures that are possible, and preferable. In order to do that in a plausible way, we must acknowledge a couple of building blocks – structural trends that will contribute to forming any probable future.

Over the next 100 years, global population will increase from the present 7 bn people to 9 bn people around the middle of this century and to around 10 bn people 100 years from now. This is the UN's midrange projection. Whilst this is an enormous increase in numbers, in historic perspective a striking feature is the levelling off of population growth after three centuries of unprecedented growth. This, in and of itself, is a significant transformation already going on, even if it does come with its own new challenges such as how to accommodate ageing populations. See figure 1.

Population trends have a lot of inertia, even as we project 100 years into the future. Of course there is a significant uncertainty, but it is not in the order of magnitude. We may feel less sure when it comes to economic development, and its impact on resource use, particularly in a situation like the present. Nevertheless the system that broke the "Malthusian trap" providing us with steady increases in average prosperity was invented 200 years ago and has proven quite resilient and dynamic. This system fused market capitalism, science and technology in a way that transformed the world, not least by making continuous economic growth a fact of life.

An important feature of this system is its reliance on fossil fuels as the dominant source of energy. Whilst relieving the Earth's forests from an unsustainable pressure and multiplying the amount of force available to humans, fossil fuels are a non-renewable resource, and their combustion gives rise to the emission of greenhouse gases that are changing and potentially destabilising the global climate.

Thus, the relationship between economic output and its attendant resource use is of central importance to judging the scope of the transformation challenge. Figure 2 shows how economic output is on an exponential growth path. It also shows that the extraction of fossil fuels has been growing along with it until in recent decades when a decoupling has occurred, so that energy use has not been growing at the same pace as GDP. This, also, can be seen as a sign of transformation of our path of development. But is it enough?

IPAT – BASELINE

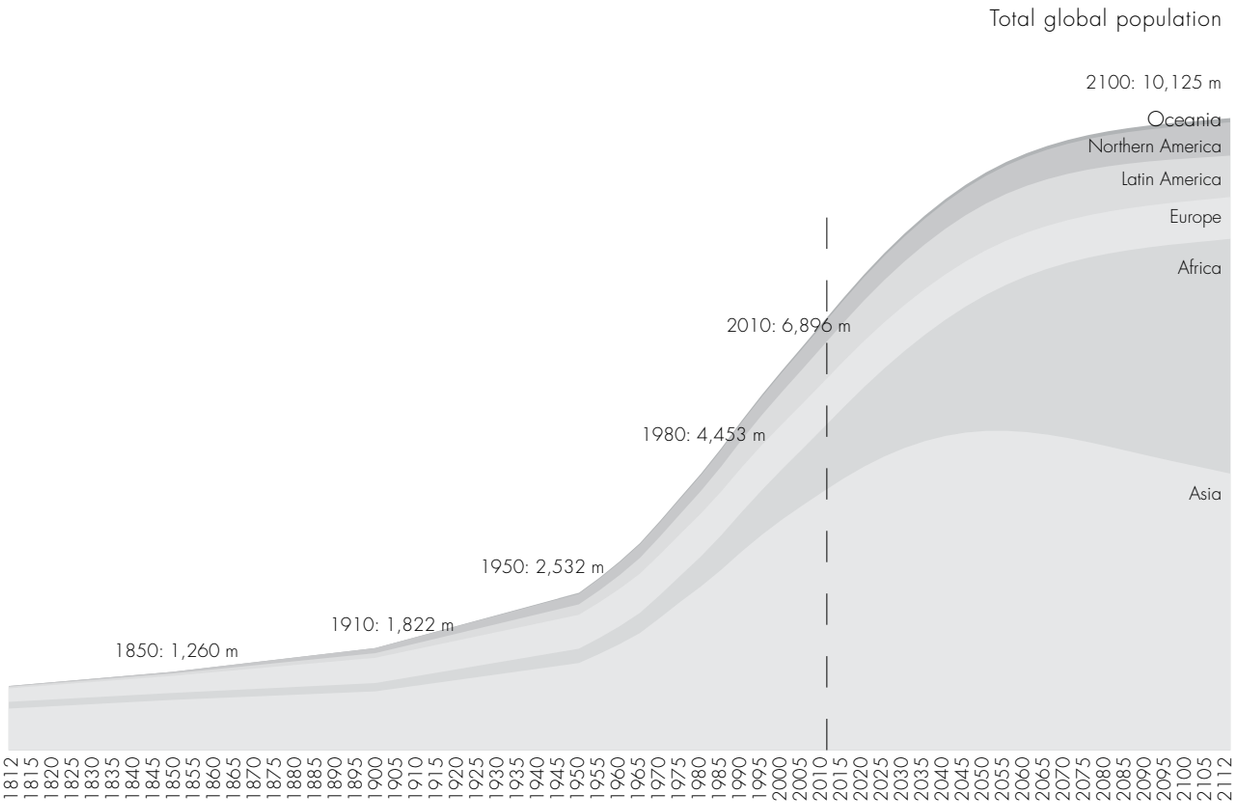
We can get an idea of the scope of the need for transformation by having a model of which impact the current path of growth will have on our resource base. This would give us a baseline scenario. A general workhorse model is the so-called IPAT equation which is originally devised by Paul Ehrlich. It states that:

Impact = Population x Affluence x Technology

One straightforward numeric application of this equation is asking about one specific type of impact, namely CO2 emissions. Projecting P as the standard population projection shown above, projecting A (affluence as expressed by annual growth in GDP per capita) along the historic trend (ca. 2% p. a.), and projecting T as the historic trend of technologically induced decoupling between output and CO2 emissions (ca. 0.7% p.a.), the resulting impact, I, is an 80% increase in CO2 emissions by 2050. This contrasts with the IPCC's recommended target of a decrease of 80% by 2050. This particular calculation is due to Tim Jackson in 'Prosperity without growth', but it is a simple exercise, and similar calculations have been done by many others.

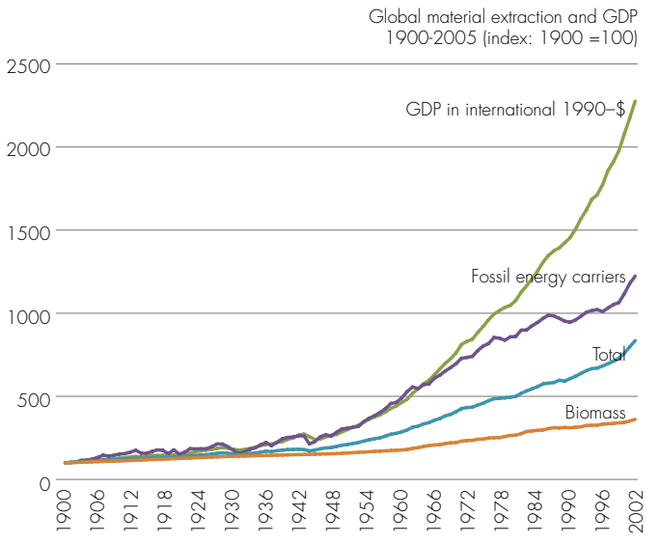
Taking P and A as given, decoupling will have to increase from its present rate of 0.7 per cent a year in recent

TOTAL GLOBAL POPULATION & FORECAST



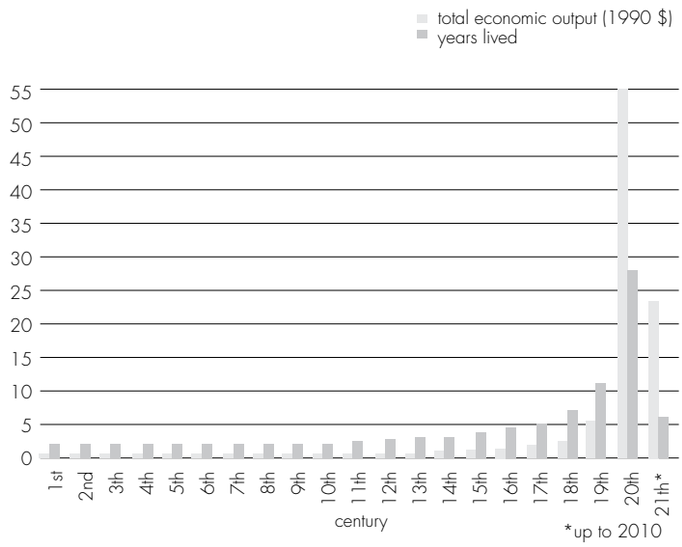
Sources: Historic data series: (1750-1950): The World At Six Billion. UN, 1999
Data series 1950-2100: World Population Prospects, the 2010 Revision – Medium variant. UN, 2011

GLOBAL MATERIAL EXTRACTION AND GDP
1900-2005 (INDEX: 1900 =100)



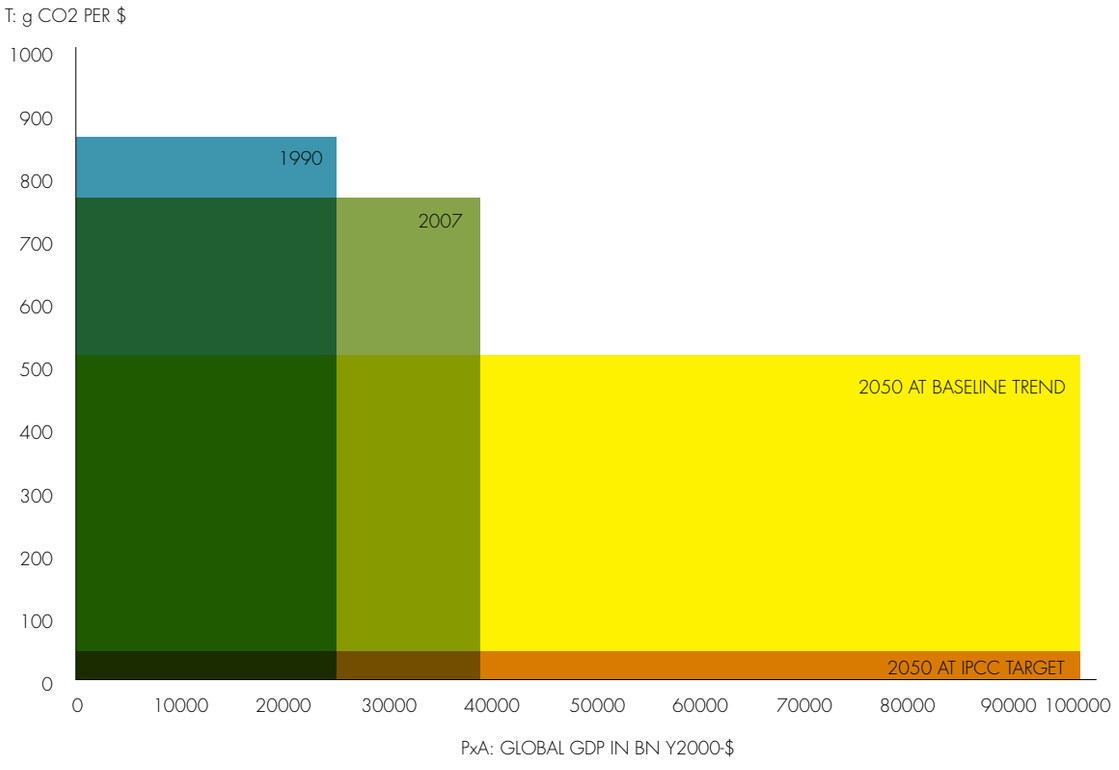
Source: Krausmann, F., Gingrich, S., Eisenmenger, N., Erb, K.H., Haberl, H., Fischer-Kowalski, M.: Growth in global materials use, GDP and population during the 20th century. Ecological Economics 2009 (in press: doi:10.1016/j.ecolecon.2009.05.007).

80% OF THE LAST 2,000 YEARS OF OUTPUT
WAS PRODUCED SINCE 1900
Percentage of total economic output (1990 $) and years lived



Source: Angus Maddison; UN; The Economist

COLOURED AREAS SHOW EMISSIONS OF CARBON DIOXIDE IN MILLION TONNES (= PxAxT)



decades, to a rate of 7 per cent, i.e. by a factor of ten over the coming decades, if the IPCC target is to be reached.

Figure 3 gives a graphic illustration which really drives home the point that the pressure on the T variable – expressed as kg CO2 per $ of economic output – is huge if we are to have any hope of meeting the 2050 emission target. The yellow area represents the baseline scenario to 2050, i.e. a scenario where decoupling continues at the pace of recent decades, and the much smaller brown area represents the scenario that meets the IPCC target.

The IPCC target may not be set in stone, and we may be able to survive overshooting it. But the exercise does indicate that we have a challenge, and that our current path of development needs further transformation.

This simple exercise also gives cause for thought about the affluence factor of the equation. Might we redefine affluence in a way that would reduce the impact on global climate and resources? Taking our cue from a variety of sources, from various wisdom traditions and bottom-up efforts to so-called happiness research, there could be good reason to question whether the specific kind and distribution of affluence that is the output of our current path of development is worth pursuing at all? This question particulary touches upon the material, resource consuming part of that affluence.

Might we, indeed, transform and rethink our mindset and behaviour in ways that would make us better off from some truer perspective while at the same time reducing the pressure on our only planet? This line of reasoning opens up very different areas of interest to pursue. Instead of being primarily a technical, economic, and/or political question, we are touching on questions about what constitutes human well-being, and happiness. It also raises the fundamental issue of our relationship with nature – and might even be said logically to pose the age old question about the meaning of life.

Normally, such questions go largely unexamined in debates on sustainability and growth. But as seen in a 100 year perspective, it might make sense for them to be part of any scenario building exercise.

So, which kind of transformation should we aim for in order to create a preferred future? This is not a question with just one possible answer. Even if we might agree on the need for transformation, there are many possible visions and ways of realising it. In order to illustrate this and inspire the discussion, it can be useful to work with different scenarios of preferred futures.

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