



PHOTOS: STINE SKOTT OLESEN



## SKETCHING TWO SCENARIOS – SETTING THE TONE OF 2112

Scenarios are images of the future, and like all images they can take many different forms. Here we have sketched two scenarios designed to inspire thinking on preferred futures in 100 years. They are based on an approach based on the following elements:

- INTEGRAL FUTURES:  
The future is formed by developments on many dimensions and many levels. We are inspired by the integral futures approach that incorporates intentional/psychological, behavioural, cultural and social/systemic dimensions.
- LONG TERM PERSPECTIVE:  
The long time horizon makes it necessary, possible and desirable to consider deep, structural factors such as mindsets, culture and systems.
- PREFERRED FUTURES:  
There are many possible, fewer probable and, very likely, even fewer preferable futures. Describing dangerous, alarming and undesirable futures can motivate action to avoid them. But discussing futures that can actually be preferred courses of development creates more positive, and potentially more durable motivation.

The two sketches given here (see p. 10-13), are intended merely as striking a note – or two different notes – for future scenarios. Thus, rather than unfolding complete images

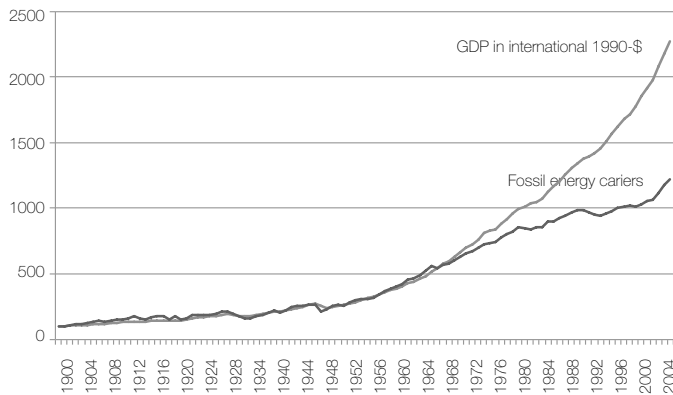
of the future, these two are first attempts to set the tone for how we might think about the future. And it's an important tone – it's one that originates in human consciousness about our relationship with nature. Are we going to dominate and manage nature, or are we going to be part of nature? House of Futures' starting point for outlining the scenarios is that there have always been limits to any given path of growth.

### BEYOND BINARY DISCUSSIONS

The current debate on growth and sustainability started four decades ago. It was set off by contributors like Paul Ehrlich and the Club of Rome who worried about population growth and resource exhaustion, the “limits to growth” debate. This debate was effectively reframed by the UN's Brundtland Commission in 1987, who consciously sought to strike a balance between the need for economic growth in order to alleviate world poverty and the need to ensure the availability of resources for future generations. The formulation was sustainable development, defined as “meeting the needs of the present without compromising the needs of future generations”. This – very broad – idea of sustainable development, including a need for economic growth, made room for views that went beyond binary discussions of whether or not to stop growth.

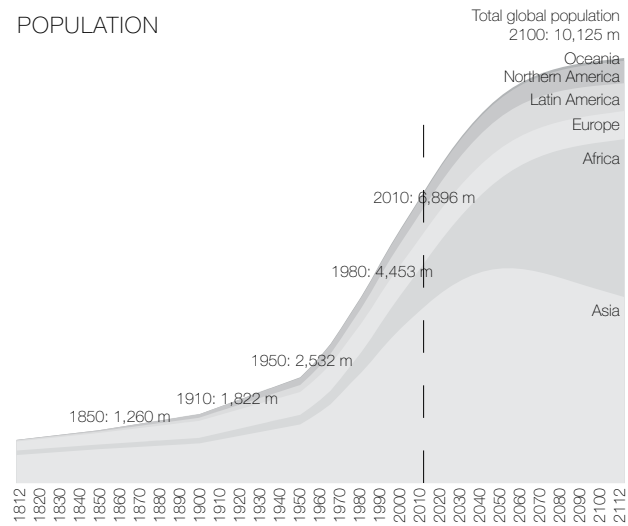
Much of this strain of the ongoing debate centres on whether and how political decision makers on vari-

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).

POPULATION



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

ous levels and guided by scientists and expert advice can manage global development in order to achieve sustainability. This is largely a top-down agenda. But running in parallel we have also seen a highly diverse, mixed, multifaceted and vigorous grassroots agenda, not only aiming at influencing the top-down discussion, but also in their own right debating and experimenting with different ways of thinking and redefining living, very much including sustainability in many aspects and dimensions. In a long historical perspective it's worth noting that the establishment of such ongoing if ever-changing and polymorphous movements is an entirely new development on the social scene.

The project "In 100 years" is designed to reworking sustainability and growth in a long time perspective, and doing so, it becomes clear that we do indeed need to go beyond binary discussions, and we do need to allow for top-down as well as bottom-up approaches.

Informed by the history of humankind and its ever-shifting relationship with nature as documented and synthesised by scientists, we have defined our working hypothesis as follows: There has always been limits to any given path of growth. There was a limit to how many people the hunter-and-gathering lifestyle could support. One estimate says hunter-gatherers require an average land area of 25 square kilometres per person to thrive. Likewise, there was a limit to the growth of agricultural societies based on given techniques. There are many examples of societies that exhausted their resource base and went under. The Sumerians, the Mayans, the ancient Mesopotamian societies, even the Roman Empire were fatally weakened by irreversible exhaustion of their resource base. The

Easter Island is one particularly stark example. And these were societies that never even succeeded in truly escaping what has been called "the Malthusian trap": The proposition that the broad mass of people will never achieve a living standard beyond minimum subsistence level because any human progress in productive capacity will simply translate into an increasing population that completely offsets income growth.

And then there is us – the descendants of societies that succeeded in transcending the limits to given paths of growth. They did this, not by rejecting growth or development, but by transforming their path of development. That is by transforming technology, economy, social systems and mindsets in a way that allowed for utilising hitherto untapped resources.

For our purpose there are two general, over-arching lessons in this. One: We cannot go on. And two: We cannot go back. As for not being able to go on, we cannot continue the path we're on when the resources on which it is based are running on empty. Currently the limits we are pushing up against the hardest are fossil fuel resources and global climate. But the strain our current path is putting on fisheries, forestries, agricultural resources, ecosystems and biodiversity surely also must be factored in.

As for not going back, our current global economy is sustaining a population of seven billion with a pattern of consumption which – uneven as it is – is part and parcel of this same economy. We can't go back to earlier stages any more than farming societies could go back to hunter-gathering. We need to move forward – we need to rethink and transform our path of development.

## BUILDING BLOCKS FOR LONG-TERM FUTURES

One of the project's aims 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 7bn people to 9bn people around the middle of this century and to around 10bn people 100 years from now. This is the UN's midrange projection. While 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.

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's not in the order of magnitude. We may feel less sure when it comes to economic development, and its impact on resource use. Nevertheless the system that broke the "Malthusian trap" 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 for energy. While 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.

Therefore, the relationship between economic output and its attendant resource use is of central importance to judging the scope of the transformation challenge.

The figure (on the left page) 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 – but that in recent decades a decoupling has occurred, so that energy use hasn't been growing at the same pace as GDP. This, too, can be seen as a sign of transformation of our path of development. But is it enough?

## PAT - 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 (originally devised by Paul Ehrlich). It states that:  $\text{Impact} = \text{Population} \times \text{Affluence} \times \text{Technology}$ .

One straightforward numeric application of this equation is asking about one specific type of impact, namely

CO<sub>2</sub> 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 (app. 2% p.a.), and projecting T as the historic trend of technologically induced decoupling between output and CO<sub>2</sub> emissions (app. 0.7% p.a.), the resulting impact, I, is an 80% increase in CO<sub>2</sub> emissions by 2050. This contrast 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's 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% a year in recent decades, to a rate of 7%, i.e. by a factor of ten over the coming decades, if the IPCC target is to be reached. 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 thinking 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 especially 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.



PHOTOS PAGE 10: STINE SKØTT OLESEN

SKETCH OF PREFERRED FUTURE SCENARIO #1:

## MAN-MADE WORLD

Geologists, biologists and climate scientists are telling us that Earth's metabolism is changing significantly, and that human activities are the main driving force behind this. They have even named a new geological era after us – the Anthropocene. This denotes an era where human-induced change in the composition of the atmosphere, land use, forest clearing, construction, fishing etc. is giving rise to qualitatively different conditions for life on Earth.

The steadily accumulating sum of knowledge and data irrefutably points to serious consequences in the form of climate change, increasing weather instability, rising ocean levels, degrading of farm land in many parts of the world, degrading eco-systems and loss of biodiversity. We need to cope with this, rationally, in order to mitigate the change as much as reasonably possible, and in order to adapt to the changes in store. This is only common sense. We need to change our course, slowly, but steadily, like a supertanker.

And we do this by applying the enormous capacity that is at our disposal: Political capacity and business/corporate capacity, science, technology, knowledge and economic resources.

People at large take the message of the scientific community to heart and demand that their leaders act on this knowledge. Politically, we negotiate binding targets for changing our ways and invest heavily in research and development of clean and green technologies. We develop the necessary institutions to negotiate, implement and enforce these policies on national and super-national levels. We put in place programs for effective disaster relief, including refugees, and effective means of conflict mediation.

Economically, we make conscious efforts to transform the way our system works in order to have stability, fairness and sustainability. Consumers accept that patterns of consumption will have to take a sustainable turn, and businesses innovatively respond to the transformed market conditions. We realize that when we put our minds to it, we can develop technologies, organizations, political institutions and business models that allow us to prosper in ways that do not jeopardize the planet. Collectively, we are approaching a state of global stewardship in which we manage our planet rationally, like any sensible landowner would his property.



PHOTOS PAGE 12: STINE SKOTT OLESEN

SKETCH OF PREFERRED FUTURE SCENARIO #2:

## THE POWER OF NATURE

Change comes in many different ways, shapes and forms. People have different cultures, languages, and traditions, but we share a common biology, and we share this planet. We are ONE. People everywhere know that we are rooted in nature. Some stress our common DNA, the laws of nature, evolution and our dependence on the earth's ecosystems. Some draw on religious imagery of an almighty Creator. And some rely on traditional wisdom and myths, emphasizing commonality and civility among humans.

On a deeper level, these are sources of meaning that we all tap into, regardless of nationality or culture. In many countries and cultures, there is an increasing realization that we depend on each other and on a shared, limited planet. This is a realization that comes with globalization and with border-crossing environmental challenges like global climate change. And it gives rise to a multiplicity of movements, large and small, of people who seek fulfillment in human relations, arts, spiritual education, nature, family, friendship, community and/or religion, pursuit of knowledge and aesthetics for their own sake, and so on.

It's a continuation of megatrends like individualization, immaterialisation of consumption, and the reflexive society – trends that are based on people at large having attained a material standard of living where physical

needs are met. It is perhaps also a reflection of the fact that people live longer and that the global population is becoming progressively older. Possibly even the rise of countries with ancient culture like China and India creating a much more multipolar world. Of course, these developments and movements are constantly evolving and changing their orientations and specific focus. Since they are highly decentralized and rooted in local circumstances, they are marked by unevenness and are often not in synch. They even clash from time to time. But in a larger perspective they do display a simultaneity and broad resemblance propelled by the constant communication, exchange and inspiration on many levels. Subcultures, communities, companies and businesses are developing and pursuing new values.

GDP and material wealth are being supplemented and de-emphasised as measures of progress and success. Concepts like happiness and quality of life are becoming more important, and as a matter of course include consideration for the Earth's resources, eco-systems and biodiversity. Humankind is maturing and tends to become an integrated organic part of the world's ecosystem rather than seeking to dominate and exploit it.