Global Bifurcation: The Decision Window*

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It has been said that our generation is the first in history that can decide whether it is the last in history. We need to add that our generation is also the first in history that can decide whether it will be the first generation of a new phase in history. We have reached a watershed in our social and cultural evolution. The sciences of systems tell us that when complex open systems, such as living organisms, and also ecologies and societies of organisms, approach a condition of critical instability, they face a moment of truth: they either transform, or break down.

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The BAU (Business as Usual) Scenario

Humankind is approaching a critical instability – a global bifurcation. The following scenarios illustrate the nature of the choice at this critical point.

- There is no real change in the world in the way business is conducted, resources are exploited and energy is produced. This leads, on the one hand, to a worsening global economic crisis, and, on the other – to major climate change due to the accelerated warming of the Earth's atmosphere.
- In some regions global warming produces drought, in others devastating storms, and in many areas it leads to harvest failures. In coastal areas vast tracts of productive land are flooded, together with cities, towns and villages. Hundreds of millions are homeless and face starvation.
- Massive waves of destitute migrants flow from coastal regions and areas afflicted with lack of food and water, above all in Africa, Asia, and Latin America, toward inland regions where the basic resources of life are more assured. The migrants overload the human and natural resources of the receiving countries and create conflict with the local populations. International relief efforts provide emergency supplies for thousands, but are helpless when confronted with millions.
- In futile attempts to stem the tidal wave of destitute people India builds up its wall along the border with Bangladesh, the U.S. along the Mexican border, and both Italy and Spain build walls to protect their northern regions from their overrun southern regions.
- The world's population fragments into states and populations intent on protecting themselves, and masses of desperate people facing imminent famine and disease. The con-

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flicts create unsustainable stresses and strains in the structure of international relations. Social and economic integration groups and political alliances break apart. Relations break down between the U.S. and its southern neighbors, the European Union and the Mediterranean countries, and India and China and the hard-hit Southeast Asian states.

- Global military spending rises exponentially as governments attempt to protect their territories and reestablish a level of order. Strong-arm régimes come to power in the traditional hot-spots and local food- and water-wars erupt between states and populations pressed to the edge of physical survival.
- Terrorist groups, nuclear proliferators, narco-traffickers, and organized crime syndicates form alliances with unscrupulous entrepreneurs to sell arms, drugs, and essential goods at exorbitant prices. Governments target the terrorists and attack the countries suspected of harboring them, but more terrorists take the place of those that are rounded up and killed or imprisoned.
- Hawks and armaments lobbies press for the use of powerful weapons to defend the territories and interests of the better-off states. Regional wars fought initially with conventional arms escalate into wars conducted with weapons of mass destruction.
- The world's interdependent and critically destabilized economic, financial and political system collapses. The environment, its productive processes and vital heat balance impaired, is no longer capable of providing food and water for more than a fraction of the surviving populations. Chaos and violence engulfs peoples and countries both rich and poor.

Here, however, is another scenario.

The TT (Timely Transformation) Scenario

- The experience of terrorism and war, together with rising poverty and the threats posed by a changing climate, trigger a widespread recognition that the time to change has come. In country after country, an initially small but soon rapidly growing nucleus of people pull together to confront the dangers of the global crisis and seize the opportunity it offers for change.
- The rise of popular movements for sustainability and peace leads to the election of political leaders who support economic cooperation and social solidarity projects. Forward-looking states monitor the dangerous trends and provide financing for the urgently needed economic, ecological, and humanitarian initiatives.
- Non-governmental organizations link up to undertake projects to revitalize regions ravaged by environmental degradation. Emergency funds are provided for countries and regions afflicted by drought, violent storms, coastal flooding, and failures of the harvest.
- Military budgets are reduced and in some states eliminated, and the resulting ‘peace-dividends’ are assigned to increase the production of staple foods, safe water, basic supplies of energy, and essential sanitation and health services for the needy disadvantaged populations.
- Country after country shifts from fossil-fuel based energy-production to alternative fuels, reducing the release of greenhouse gases into the atmosphere and slowing the process of global warming. A globally networked renewable energy system comes on line, contributing to food production, providing energy for desalinizing and filtering sea-water, and helping to lift marginalized populations from the vicious cycles of poverty.

• Leading business companies join the classical pursuit of profit and growth with the quest for social and ecological responsibility. On the initiative of enlightened managers a voluntarily self-regulating social market economy is put in place, and the newly elected forward-looking political leaders give it full support.

• As the new energy system and the self-regulating social market economy begins to function, access to economic activity and technical and financial resources becomes available to all countries and economies. Frustration, resentment, animosity and distrust give way to a spirit of cooperation, liberating the spirit and enhancing the creativity of a new generation of locally active and globally thinking people. Humanity is on the way to a peaceful and sustainable, diverse yet cooperative planet-wide civilization.

The choice between these scenarios is not yet made. As of today, we are moving along the path of the BAU scenario, but more and more people are waking up and searching for ways to move to a scenario of timely transformation. The question is, how much time is there for this shift? The window of time is finite: when conditions in a complex open system reach a critical point the system becomes chaotic, and it either transforms, or breaks down. The longer the transformation is delayed, the more difficult it becomes to carry it out.

To define the feasible decision-window we must take into account both the time by which individual trends reach a critical phase, and cross-impacts and feedbacks among the trends.

1) *The unfolding of individual trends.* Time estimates of when individual life-threatening trends would reach points of criticality have been reduced from the end of the century to mid-century, and for some trends to the next ten to twenty years.

For example, the sea level has been rising one and a half times faster than predicted in the IPCC's Third Assessment Report published in 2001. Forecasts published at the end of 2008 project global sea-level rise that is more than double the 0.59 meter rise forecast even by the Fourth Assessment Report.

Carbon dioxide emissions and global warming have likewise outpaced expectations. The rate of increase of CO_2 emissions rose from 1.1 percent between 1990 and 1999 to over 3 percent between 2000 and 2004. Since 2000 the growth-rate of emission has been greater than in any of the scenarios used by the IPCC in both the Third and Fourth Assessment Reports.

The warming of the atmosphere progressed faster than expected as well. In the 1990s forecasts spoke of an overall warming of maximum 3 degrees Celsius by the end of the century. Then the time-horizon for this level of increase was reduced to the middle of the century, and presently some experts predict that it could occur within a decade. At the same time, the prediction for the maximum level of global warming rose from 3 to 6 degrees. The difference is not negligible. A three degree warming would cause serious disruption in human life and economic activity, while a six degree warming would make most of the planet unsuitable for food production and large-scale human habitation.

2) *Feedbacks and cross-impacts.* Most predictions of points of criticality take into consideration only one trend – the global warming and attendant climate change; water quality and availability; food production and self-reliance; urban viability, poverty, and population pressure; air quality and minimal health standards, or others. They fail to consider the possibility that a criticality in one trend could accelerate the unfolding of other trends toward a point of criticality.

There are multiple feedbacks and cross-impacts among the relevant trends, both in regard to the biosphere and conditions in the human world.

In the biosphere, all the trends that affect human life and well-being also impact on the cycles that maintain the planet's ecology within a humanly viable range. This is the case in regard to the global water and the global carbon cycle: the alteration of these cycles by any one trend affects the way the other trends unfold. For example, an increase of carbon dioxide in the atmosphere leads to global warming and that affects rainfall and the growth of forests. That, in turn, reduces the biosphere's carbon absorption capacity. Feedbacks are also conveyed by air and ocean currents. Warmer water in the oceans triggers hurricanes and other violent storms alters the course of major ocean currents, such as the Gulf and the Humbold. And that triggers further changes in the climate.

Feedbacks also obtain between ecological and societal trends. For example: The warming of the atmosphere produces prolonged drought in some areas and coastal flooding in others. Starving and homeless masses are impelled to migrate from the highly impacted areas to less hard-hit regions creating critical conditions in those regions as well. A drop in the quality of the air in urban and industrial megacomplexes below the minimum required for health creates a breakdown in public health, with epidemics spreading to vast areas. A breakdown of the financial system would impact not only on banks and stock markets, but would interfere with industrial output and trade the world over, creating critical conditions first of all for the poorest countries and economies.

Cross-impacts among accelerating global trends reduces the feasible decision-window. The precise time for effecting meaningful change is not predictable with certainty, but due to feedback and cross-impacts among the trends, it is likely to be less than the forecasts of critical points for individual trends. The decision-window may close within ten years and possibly sooner.