Living Sustainability
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"What can I do for sustainability?"
My wife Katja and I just wanted to get away for a couple days, hiking in the mountains, breathing fresh air, sleeping in, having good food–and *no* discussions about sustainability. We thought even sustainability enthusiasts deserve a break once in a while. We underestimated the enthusiasm on the other side of the breakfast table. "School of Sustainability? Yes, that's very important! We've started to recycle more...and my husband has changed some of our light bulbs..." So, here we go again: "Well, sustainability is not so much about recycling and light bulbs...Actually, it is *also* about recycling and light bulbs, but it goes deeper. It has to do with the core of our society: how and what we produce, distribute and consume; what we value and feel responsible for; what we are willing to risk; and, what we envision our heritage to be–in short, how we live our lives now and in the future." "This is an interesting perspective...but it seems quite complicated. What can *I* do for sustainability?" and the conversation continues.

People are becoming more and more interested in sustainability, most often in honest attempts to "do the right thing." Interest has grown, but the debate has also been filled with simplistic assumptions. Catchy phrases and fast recipes circulate and solidify inaccurate perceptions of sustainability. One prominent simplification reduces sustainability to a single one of its components, be it new environmentalism, economic sustainability or social equity. On the contrary, sustainability is about linking and balancing all of these components. Similarly misleading is the promotion of sustainable technologies, which focus on "green," "clean," "carbon-neutral" technologies under the assumption that new technologies are an adequate response to contemporary sustainability challenges. A more sophisticated, namely academic misrepresentation is "soft sustainability," which suggests that self-regulation and incrementalism will suffice to reach sustainability. Another claims that sustainability is a never-ending process rather than a state we could ever hope to achieve. The common denominator of all these oversimplifications is the self-deceptive belief that we can continue along the same old paths that led us here and still reach the new goals of sustainability. Simply put, that will not work.

Through its genuine, holistic meaning, sustainability has the potential to change the course of our society. For a long time, an exploitative spirit that focused on short-term gains for individuals and interest groups has dominated the development of our society. This persistent perspective has led many of us to approach people, nature and even ourselves in utilitarian ways. However, a new mindset inspired by sustainability carries an *enabling* spirit and reconciles individual ambition with collective achievements. It dares to ask inconvenient questions about how we do business, what we buy, how we spend public money and what the long-term implications of our lifestyles are. Let's look around: What do we contribute to our society? What values does our society represent? What will we be remembered for?

The bare facts quickly wake us from our "American dream." More than 37 million Americans (approximately 12% of the overall population) live in poverty. More than 46 million (15%) lack proper health coverage. More than 1.2 million students drop out of high school before graduating (30% of all students). More than 208 million Americans (68%) are overweight or obese. More than 7 million are on probation, in prison or on parole (3% of all adult residents). The United States has emitted more greenhouse gases than any other country in the world. Armed forces are involved in multiple wars and military interventions around the globe.[1] This list of system-wide deficiencies continues with the federal budgetary

[1] Data 2007-2009. Feeding America: Hunger in America 2010. Chicago, 2009. US Census Bureau. Income, poverty, and health insurance coverage in the United States: 2008. (The new health care reform passed on March 23, 2010 will significantly reduce the number of uninsured US citizens.) Heckman, J.J., LaFontaine, P.A. (2007). The American High School Graduation Rate: Trends and Levels. Cambridge, MA: National Bureau of Economic Research. Centers for Disease Control and Prevention (http://www.cdc.gov/obesity/). Bureau of Justice Statistics (http://bjs.ojp.usdoj.gov). Environmental Protection Agency (http://www.epa.gov/climatechange/emissions).

deficit and related interest payments, unemployment, illiteracy, racial tensions, addiction, violence, environmental degradation and ever declining happiness. These social downtrends result in broader economic, social and environmental effects, including higher rates of social unrest, poverty, mortality and intercultural antagonism. Rather than being the result of a single catastrophic event, the state of our society is the product of a continuous series of systemic failures over the last decades. In other words, these failures lead back to us–to our politics, decisions, actions and behavior. We, the American people, are so cocooned in the culture of fear that we spend a (recently increased) budget of more than 660 billion dollars annually for national defense. But we do not provide our children with healthy food, quality education and an intact climate. Our choices.

Sustainability offers far more than an honest account of our spending, working and living. It stimulates creativity and innovation. It enables us to truly appreciate and care for the diversity of our natural landscapes, histories, cultures and lifestyles within a larger international and global context. It also inspires new generations of business people, engineers, investors, real estate agents, designers, soldiers and other professionals–giving new meaning and value to these professions. Sustainability enables us to have bold visions for the future. It lets us dare to imagine, for instance, that our military and national security services could be transformed into unarmed *social forces*, engaged in all civil domains to create sustainable communities around the globe. It offers a transformative lens for learning about and engaging the world. At the same time, sustainability enables us to recognize those who are already out there, slowly but steadily transforming governments, businesses, universities and communities.

Sustainability is also about being cautious and smart as an *evolving society*. An endless list of studies on human fallibility, biases and deficits should have taught us enough about ourselves,[2] but we are still in the Stone Age when it comes to finding sensitive and efficient ways of changing the course of our society. The prevalent approach to solving complex social problems remains discipline and punishment by force.[3] Instead of creating places of social retention in our midst that would deescalate, mitigate and prevent conflict and unrest (like flood retention basins), we continuously shift or aggravate the problems we claim to have "fixed." In addition, we have stigmatized limits and come to believe that scale is irrelevant. In fact, a country that integrates fifty states, covers 3.8 million square miles and is inhabited by an ethically and culturally highly diverse population of more than 300 million people is far beyond our comprehension. Sustainability teaches us a great deal about acknowledging the limits of our mental capacity, redesigning systems to be comprehensible and manageable on a human scale, and governing in social networks that we can understand in a holistic sense.

Sustainability is gaining momentum, and more and more people would like to contribute. Actually, everybody can, and we need to get everyone on board. But sustainability is intricate, undermines our 'good intentions' and pushes us out of our comfort zones. It is a demanding worldview and it sometimes teaches us to be careful what we wish for. Yet, it is intoxicating because it promises more than an intellectual adventure. It ties knowledge to action and forces us to make a difference.

This essay pursues two objectives: making sustainability tangible and motivating the reader to further engage with it. Along the way, I will deconstruct some of the oversimplifications circulating in the sustainability discourse. The remainder of the essay is structured into the following four parts, each offering a sustainability guideline that has emerged from debates, research and practical decision-making:

1. Taking a long view into the future
2. Understanding complexity
3. Envisioning sustainability and deliberating values
4. Building strategies, taking action and learning from experience

The essay concludes by exploring how we might be able to bring others on board. I hope the essay sheds some light on facets of sustainability and helps bring sustainability to life.

[2] Cf. Crow, M.H. (2007). None dare call it hubris: The limits of knowledge. Issues in Science and Technology, Winter 2007, pp. 1-4.

[3] Michel Foucault has demonstrated in *Discipline and Punish: The Birth of the Prison* (New York : Pantheon Books, 1977) that this approach is historically contingent and covers only a small segment of a broad spectrum of approaches to sanction deviant behavior.

I attended an event that featured a replay of Severn Cullis-Suzuki's courageous speech at the UN Earth Summit in Rio de Janeiro in June 1992. She was 12 years old and addressed the delegates with the words: "I have no hidden agenda. I am fighting for my future."[7] *Being* the future generation, her claim to be fighting for her future is a powerful statement. And these are the voices we should be searching for. In practice, we could begin treating the future seriously by, for example, involving legal guardians that represent the perspectives and interests of future generations in public hearings and governing processes.[8]

Understanding complexity

Modern societies have become increasingly complex with their industrial systems, trade networks, social conventions and legislative frameworks, all of which evolve in different places and interact on local to global scales. High levels of complexity create significant challenges for understanding and governing our society, and sustainability challenges arise partially as a result of this process. Increasingly complex cause-and-effect relations make it ever more difficult to understand the implications of our actions, including feedback loops, cascading effects, unintended consequences and surprises. Sustainability challenges pose a historically unprecedented provocation to the collective human capacity. There is substantial evidence that we are not particularly well prepared for the task. Our capacity for interconnected thinking and holistic understanding is not only limited by our working memory capacity, but by a variety of other biases and flawed heuristics.[9] These evolutionary limitations have further been exacerbated by our societal decision to deemphasize intuitive and emotional capacities in education.

In spite of this challenge, more and more voices emphasize that our capacity for understanding complexity is vital for dealing with sustainability. A recent exploratory study on sustainability programs in higher education around the globe indicates that the majority of programs considers systems thinking as the most important sustainability competency for students.[10] What does it mean to understand complexity, and how do we do it? Here are three suggestions.

Overcome end-of-pipe thinking. Similar to taking a long view into the future, understanding complexity in pursuit of sustainability is a new lens, a new mindset for approaching the world. It requires looking beneath the surface and behind the façade. It requires looking past what comes out at the end of the pipe, e.g., greenhouse gas emissions, to see what goes into energy production and why. It requires tracing back contamination, exploitation, death and decline, along with success, equity, peace and beauty to their roots and creators.

Why is it so hard to build this capacity? First, because it is inconvenient to play the "blame game" seriously. Blaming the market, the government or fate, is easy, but calling for responsibility from individuals and groups, including ourselves, is challenging. Second, we are used to dramatic, superficial and episodic information. The media are full of examples of sensationalism.[11] Even quality media succumb to presenting information in this way. NPR has recently broadcast a feature on "pesticide drifts" from agricultural sites into schools, hospitals and child care centers.[12] The report leaves all the relevant questions unasked: Why aren't the existing regulations enforced and fines paid? Who is benefiting from the application of pesticides? Why are there farm workers without health insurance? Why do we use pesticides? What are the alternatives? And so forth. The same pattern, which hides true causes, can be found in a majority of reports on public issues such as security, crime, health and education. But it would be too simple to only blame the media. These patterns pervade our culture.

[7] http://www.youtube.com/watch?v=uZsDliXzyAY&feature=related (visited March 15, 2010)

[8] Carolyn Raffensperger from the Science and Environmental Health Network, together with Burns Weston from the Vermont Law School, and other colleagues are pursuing an initiative that would establish an "Office of Legal Guardian for Future Generations" and a training and certificate program for legal guardians for future generations.

[9] Doerner, D. (1990). The logic of failure. *Philosophical Transactions of the Royal Society of London*. Series B, Biological Sciences, 327, pp. 463-473.

[10] Wiek, A., Withycombe, L., Fuller, A., Banas Mill, S. (2010). Core Competencies in Sustainability–A Survey of Academic Programs. Working Paper. School of Sustainability, Arizona State University.

[11] Some implications of these media features on understanding and capacity building are spelled out in: Milburn, M.A., McGrail, A. B. (1992). The dramatic presentation of news and its effects on cognitive complexity. *Political Psychology*, 13, pp. 613-632.

[12] February 28, 2010. www.npr.org/templates/story/story.php?storyId=123817702&ft=1&f=1003

Taking a long view into the future

Since the Brundtland report, "future generations" have been an integral consideration for sustainability.[4] Sustainability rests on the insight that contemporary actions may in fact threaten the well-being of our descendants. Escalating violent conflicts, global climate change and persistent, hazardous pollution are just three examples of contemporary trends that will detrimentally affect future generations. Clearly such consideration is important but somewhat intangible, as it extrapolates sustainability into an abstract and anonymous future. First, considering future generations challenges our cognitive capacity, since we struggle to imagine daily life several generations from now. More importantly, this consideration challenges us to empathize with people who are yet to be born. Empathy for and solidarity with "future generations" seems feasible only for people with a superior ethical sense. How can we make "future generations" tangible and meaningful to all of us? Here are three suggestions.

Make the future personal. What can we remember? Our lives. And our memories lead us back to the generations of our parents and grandparents–their experiences, wishes, fears and dreams as we encounter them in shared experiences, stories, letters and pictures. Our collective memories reach much further back into the past, but our personal history relies on what we can still remember since our childhood days. Could we think about the future as if we would remember the times of our parents and grandparents? What will the world of our children and grandchildren look like? We connect more strongly with the future when we ask what burdens we are willing to place on our own children and grandchildren, rather than abstract "future generations." We are grounded and caught up in the present, our immediate surroundings, patterns and habits, but we have the capacity to release ourselves temporarily from this dominance and transcend the present with imagination, visualization and the craft of storytelling. Good examples are initiatives where researchers cooperate with the public to explore the implications of climate change on their region.[5] They visualize different future scenarios at recognizable places and locations that matter to the people on site; these are their places. With the future becoming tangible in visuals and stories, people are able to experience the very same places as being those of their children and grandchildren.

Open the future up. Our thinking about the future often rests on one-dimensional extrapolations. This holds true not only for the omnipresent predictions from weather to economic forecasts but also for fiction and art. One example is the film, "The Day After Tomorrow", directed by Roland Emmerich (2004). Many experts have reacted to this and other disaster movies by critiquing them as inaccurate. This assessment misses the point. It is more problematic that these movies *limit* our imagination by presenting a single narrative of the future. In effect, the experts are calling for *less* speculative thinking when, in fact, we need *more*. Many cultures have dreamed about predicting the future. Even now, this dream continues to inspire modern science. Such hopes have been dashed as we have seen that predicting the course of our complex society beyond five to ten years is simply beyond our capacity.[6] But what is the value of prediction in the first place? Let's assume we could predict the course of our society. It seems that this would eliminate choice and bind us to an inescapable fate. This insight has led to the rise of thinking about futures as possible alternatives that are only partly determined by previous decisions and actions (so called "path dependency").

Treat the future seriously. Future generations have the disadvantage of not being here yet. They have no voice. Our educational systems are full of courses on history and current events. Why do we exclude mandatory classes on the *future*? Why do we teach our students what (might have) happened a couple of hundred years ago, but not how to explore their future, as individuals and society? When I was a graduate student in Berlin in the late 1990s,

[4] The 'Bruntland Report' states that sustainable development "meets the needs of the present without compromising the abilities of future generations to meet their own needs" (World Commission on Environment and Development (1987). *Our Common Future*. Oxford: Oxford University Press. p. 43).

[5] Shaw A, Sheppard S, Burch S, Flanders D, Wiek A, Carmichael J, Robinson J, Cohen S. (2009). Making local futures tangible–Synthesizing, downscaling, and visualizing climate scenarios for participatory capacity building. Global Environmental Change, 19, pp. 447-463. Baker JP, Hulse DW, Gregory SV, White D, Van Sickle J, Berger PA et al (2004) Alternative futures for the Willamette River Basin, Oregon. *Ecological Applications*, 14, pp. 313–324.

[6] Robinson, J. (1988). Unlearning and backcasting: rethinking some of the questions we ask about the future. *Technological Forecasting and Social Change*, 33, pp. 325–338. Doran, C.F. (1999). Why forecasts fail: The limits and potential of forecasting in international relations and economics. *International Studies Review*, 1, pp. 11-41.

limited cognitive and emotional capacities. Instead of accepting adverse side effects that inevitably result from the complexity of the systems we design ("normal accidents"), we might want to avoid them by designing simpler systems we can understand and manage.

Feel complexity. While it may sound awkward or touchy feely, the following describes why emotional capacity is important for sustainability. Let's reflect on an average product imported from Asia into the US. Assume we know the specific circumstances of how we affect local and regional livelihood, social structure and environment by our demand. Also, assume we know how the greenhouse gases emitted during the long-distance transportation of the product affect people in specific regions in South-East Asia (e.g. sea level rise) or in Central Africa (e.g. droughts). Finally, assume we know the detrimental labor conditions of immigrant workers who package and distribute the product in the US. And so forth. In short, let's assume we can catch the rabbit. Does this make us *understand* complexity? Do facts and figures suffice for understanding? It comes back to the human scale and our limits of capacity, here with respect to empathy and solidarity. Consider the phrase "I understand you," spoken with genuine intent. This phrase means we feel a deep sense of empathy for the person on the other side, even if we do not even know a great deal about her or him. Our emotional capacity is an intangible, yet, essential component of sustainability, and it adds another dimension to the challenge of coping with complexity.

Envisioning sustainability and deliberating values

> "Imagine the best version of Phoenix in 2050–the city of our children and grandchildren–as if we would be remembering the times of our grandparents. How do they live in our city? Our urban *community* enables a high quality of life for all residents in 2050. Phoenix neighborhoods have a unique sense of place created by memorable locations and community events. Careful adaptation and innovation accounts for new values and preferences emerging in the communities. Strong communities not only tolerate but celebrate diversity of history, culture, ethnicity, social background and lifestyle. Revitalized historical neighborhoods in concert with other vibrant neighborhoods provide diverse and rich opportunities to experience arts and culture for all segments of the population, including art galleries, public art, museums and theaters. [...]"

The extended version of this urban vision was presented at a large public visioning workshop in Phoenix organized by the Planning Department of the City of Phoenix in collaboration with the School of Sustainability at Arizona State University on March 6, 2010.[15] More than 100 citizens from across the city participated in the workshop. In preparation for the event, the planning department had elicited about 1,000 value and vision statements in semi-public events across the city. This collection indicated that there is great interest but limited capacity to envision a desirable future for the city. The majority of statements were hardly visionary. They could generally be summarized as "doing a bit better than now." In a typical visioning exercise, this initial collection would often be the end point. Here, it was the starting point for the workshop, which collectively *crafted* a sustainability vision for Phoenix. The workshop team designed a series of deliberative activities all of which addressed sustainability issues. According to participants, the event covered a great deal of ground in building capacity for sustainability planning and action.

Thinking about the future and understanding complexity are necessary components of sustainability, but they are not sufficient. Sustainability requires *direction* that stimulates and guides our actions. Sustainability is explicitly value-laden and normative, posing the question of how our society *ought* to be developed in a way that balances socio-economic activities and environmental capacities in the long term and from local to global levels. This quest is challenged by critical issues of dissent and unbalanced power relations that jeopardize principles of democratic governance in which all voices are heard and considered. An even greater challenge is the rhetorical approach to visions, which fails to take them seriously as guiding aids that demand accountability. How can we create visions that inspire us, account for sustainability and are taken seriously? Here are three suggestions.

[15] Wiek, A., Iwaniec, D., Johnson, C., Selin, C. et al. (2010). Creating and Crafting a Sustainability Vision for Phoenix. Working Paper. School of Sustainability, Arizona State University. http://phoenix.gov/citygovernment/planres/cityplan/planphx/index.html

ASU students from Omega Phi Chi draw *Fundreds* at ASU Art Museum

Two other, seemingly less obvious examples are the Nagasaki Atomic Bomb Museum in Nagasaki, Japan, and the animated documentary film "Waltz with Bashir" directed by Ari Folman (2008). Both almost exclusively focus on terminal events and related experiences, disregarding the long and complex chain of causes and effects that led up to them. Visitors to the atomic bomb museum are exposed to many details of what happened on August 9, 1945, and its aftermath, but no attempt was made to reveal the causes, actors, motives, politics and cultural norms that enabled and led up to the event. Similarly, the film "Waltz with Bashir" documents the personal quest of a former soldier in the Israeli Defense Force to regain his memory of the Sabra and Shatila massacre and related experiences.[13] The quest about the event is the focal point; a deeper understanding of the roots and causes of the massacre and the involvement of the soldier is not conveyed.

The feature film "Paradise Now" directed by Hany Abu-Assad (2005) takes a distinctly different approach. This film focuses on the causes, motives, propaganda, the individual and collective involvement that enable and lead up to suicide attacks in the Palestinian-Israeli conflict. To emphasize this perspective, the terminal event is not even part of the film (the final sequence fades out before the detonation).

End the race to the bottom. It seems that we are always one step behind "catching the rabbit" when it comes to understanding the complexity of the systems we design. A good example is the modern version of technological innovation. The tension between technological advancements and insufficient understanding of adverse side effects (long-term implications), which is usually 'resolved' in favor of the technological advancements, has been described by David Collingridge and others in the early 1980s.[14] Still, our predominant response to increased complexity is a call for greater knowledge. This call drives the science enterprise in general and large-scale programs on life-cycle assessment, material and substance flow analysis in particular. While we are largely incapable of anticipating, let alone managing, adverse side effects of complex technologies and systems, we continue chasing the rabbit. Sustainability suggests ending this race to the bottom. There are good reasons to doubt that a more refined study, a larger sample, a better data processor might deliver the ultimate answers we are looking for. Sustainability thinkers have argued for taking a different approach, one that balances systems' complexity with our

[13] In the Sabra and Shatila massacre more than 3,000 Palestinian and Lebanese Muslim civilians were killed by the Christian Lebanese Forces with connivance of the Israeli Defense Force on September 16-18, 1982. See: Shahid, L. (2002). The Sabra and Shatila massacres: Eye-witness reports. *Journal of Palestine Studies* 32, pp. 36–58.

[14] Collingridge, D. (1980). *The Social Control of Technology*. London: Printer. Perrow, C. (1984). *Normal Accidents: Living With High Risk Technologies*. New York: Basic Books.

Building strategies, taking action and learning

Sustainability facilitates our look into the future, informs our understanding of complexity, and gives us direction. On this basis, we build strategies that guide our decisions and actions to get our society from where we are now to where we want to be, recognizing that it takes considerable effort to develop and implement these strategies. Strategies translate into action but need to be adjusted over time to utilize new experiences and insights. The cycle of solving sustainability problems and creating opportunities for sustainability is therefore completed by reflection, learning and adaptation. What do strategies, actions and learning for sustainability entail? Here are three suggestions.

Plan and test strategies. Planning and elaborating strategies is a strenuous endeavor, quite different from the idea of simply putting a vision into practice. Strategies for sustainability are transformative, and thus we should be better prepared to cope with resistance, obstacles, inertia that might work against us. There are also many enabling factors we want to capitalize on. While learning by doing is relevant at a later stage, learning *before* doing is the key feature of strategic capacity. The reasoning is simple: failed strategies require a great deal of additional resources to fix them, if they can be fixed at all. Strategies entail sequences of steps, timelines, resource allocation, maps of potential barriers, coping plans, etc. "Robust strategy" is no longer an empty phrase. It means that the strategy has been tested, adjusted, tested again and so forth. We use our insights into the complexity of the system we intend to transform and keep the eyes on our vision while anticipating path dependencies that might deviate from the intended pathway in order to carefully examine whether the strategies really have the transformative potential they promise.

Let's take as a prominent test case the strategy for transforming Afghanistan which has been detailed and justified by President Obama and his advisors.[19] For a comprehensive analysis, it would be necessary to conduct a detailed investigation about the vision created and crafted for Afghanistan that guides this strategy, but let us naively assume our government would possess such a sound basis for leading Afghanistan into a sustainable future. Does the strategy pursued fulfill the requirements indicated above? Has it demonstrated in rigorous tests that it would lead to the intended outcomes? Doubts are cast from various peace and conflict studies which seem to point in the same direction: If you want to create peace, stability and sustainability, send a new type of hero. Send teachers, doctors, social workers, farmers, students, social entrepreneurs, chefs, microfinance managers, artists and machinists. Furthermore, send them in the thousands to mobilize a critical civil mass, but don't send (more) soldiers![20] Accordingly, Nicholas Kristof has recently proposed an alternative strategy for Afghanistan as simple as "More Schools, not Troops".[21] This is not a flimsy alternative. On the contrary, it is well substantiated in empirical evidence–more so than the strategy currently being implemented. It is our society's choice to be guided either by politics as usual or by advanced strategy building for sustainability. Similarly transformative proposals towards sustainability have been made, for instance, for our struggling economy.[22]

Explore, experiment and experience local action. A general feature of sustainability strategies and actions refers back to the earlier discussion on complexity. Considering the increasingly complex systems we are dealing with, can we reasonably estimate the impacts of our actions? And if not, what does this imply for our strategies and actions towards sustainability? Sustainability advocates for actions that acknowledge the human scale.[23] What if we would only take actions for which we can reasonably comprehend the impacts? What kind of products would we produce and buy? What modes of transportation would we use and support? If we cannot catch the rabbit, why not reduce the complexity of the systems we are dealing with? Current trends in regionalizing and localizing food, energy,

[19] The White House, Office of the Press Secretary (2009). Fact Sheet–The Way Forward in Afghanistan. December 1, 2009. Retrieved on March 15, 2010 at: www.whitehouse.gov

[20] Cf. Rubin, B.R., Saikal, A., Lindley-French, J. (2009). The way forward in Afghanistan: Three views. *Survival*, 51, pp. 83-96. Rubin, B.R., Jones, B.D. (2007). Prevention of violent conflict: Tasks and challenges for the United Nations. *Global Governance*, 13, pp. 391–408.

[21] Kristof, Nicholas D. (2009, October 28). More Schools, not Troops. *The New York Times*, A 23.

[22] Pollin, R., H. Garnett-Peltier, J. Heintz, and H. Scharber (2008). *Green recovery: A program to create good jobs and start building a low-carbon economy*. Political Economy Research Institute, University of Massachusetts–Amherst, and the Center for American Progress.

[23] Ginzberg, E., Vojta, G. (1985). *Beyond Human Scale–The Large Corporation at Risk*. New York: Basic Books. Collingridge, D. (1992). *The Management of Scale*. London: Routledge.

Be creative. Visioning is supposed to be a creative activity, in particular when imagining a desirable state 25 to 50 years in the future. Yet, we seem to think we can just bring people in a room and it will happen spontaneously. Usually, it doesn't. Because we are often caught up in the present and focus on facts and figures, our capacity for thinking about desirable possibilities, alternatives, potentials and opportunities withers. We need to uncouple from the dominant focus of attention and actively facilitate creative dialogue. Creativity techniques for individuals and groups have been developed in psychology, management studies and decision research. More importantly, we have a large community in our midst that specializes in creativity. The majority of artists are committed to transcending the status quo and envisioning the future in radically new ways.

Finally, we should not forget that "the future is already here". We might want to shape our views to become aware of all the niches of change and transformation around us. There is another challenge in visioning activities, exemplified by the following. I recently attended a briefing on the future of agriculture and water in the Phoenix Metropolitan Area. Prominent stakeholders argued that it is impossible to change the existing water infrastructure to accommodate new forms of local farming and small-scale urban agriculture. Is this truly impossible? Recognizing that Phoenix has probably seen more changes in infrastructure than any other metropolitan area in the country over the last 30 years, it is hard to believe that infrastructure changes in the future are impossible. Yet, there might be a strong *interest* in keeping the status quo. Visions often pose threats to those who benefit from the status quo, and this obstacle needs to be actively addressed.

Craft what we have created. A great many visions not only lack inspiration due to flawed visioning processes, but are also poorly crafted. We can do better. In shaping our utopian thoughts, we want to use analytical filters to account for complexity, coherence and sustainability. We first scrutinize the vision with respect to the interdependencies among its components to better understand the inner structure of the vision and how it works. We then explore trade-offs and synergies among important components to understand that not all preferences are compatible with each other, that some have particular affinity (so-called "win-win" situations). Finally, we check for compliance with sustainability principles and ideas, which sharpens the overall sustainability profile of the vision and helps us to specify what sustainability entails in the particular context. Numerous sustainability principles have been proposed, including socio-ecological system integrity, livelihood sufficiency and opportunity, resource maintenance and efficiency, and social and cultural civility.[16]

Deliberate values. There is no single sustainability vision; there are thousands. And there are thousands of visions that are *not* sustainability visions. Demarcating and specifying sustainability visions relies on mapping out and deliberating *values*, which is not a Sunday stroll. Who is involved? Who is heard? Whose values are built into the vision? Deliberative processes require inclusiveness and engagement in every step. Yet, we are neither individually nor collectively nor institutionally well prepared for articulating and deliberating values. How often do we confront ourselves with ethical considerations? And do we actually know what we truly value and what we need? Studies on happiness converge on the insight that beyond a level of fulfilled basic needs, happiness seems to be inversely correlated with greater material wealth. More does not make us happier. We are still in search for the upper boundaries that would make us abstain from overproduction and over-consumption–in short, from continuing over-development. Finding these boundaries requires becoming collectively smarter and more cautious with ourselves. We need to direct our attention away from the means and to the ends. What type of society do we aspire to become when we perpetuate a culture of fear and discipline kids with handcuffs?[17]

Our ability to create and craft desirable and sustainable visions is a powerful capacity. Visions push the representatives of the status quo out of their comfort zone if there is a chance that people might take action to realize their vision. T.E. Lawrence wrote, "All people dream: but not equally. Those who dream by night in the dusty recesses of their minds wake in the day to find that it was vanity. But the dreamers of the day are dangerous people, for they may act their dreams with open eyes to make it possible."[18]

[16] Gibson, R.B. (2006). Sustainability assessment. *Impact Assessment and Project Appraisal*, 24, pp. 170-182.

[17] Herbert, Bob. (2010, March 6). Cops vs. Kids. *The New York Times*.

[18] Lawrence, T.E. (1935/1987). *Seven Pillars of Wisdom*. Ware, UK: Wordsworth. p. 7.

water and other essential supply systems, point in this direction. A good example is the "Go Local" initiative in Sonoma County, which also introduced a simple local credit system.[24]

Sustainability action cuts across all levels, classes and sectors of our society. All we know about transformative processes of change is that individual responsibility cannot be compensated by institutional obligations or vice versa.[25] They depend upon each other. We won't make a difference if we blame "the public" and lean back. *We* are the public. Our individual and collective actions will determine the sustainability of our future. How do we overcome resistance, fear and laziness? One strategy is to create secure spaces that keep participation somewhat noncommittal and make it easy and fun to explore, experiment with, and experience new products, behavior and encounters towards sustainability. Museums, schools, theaters and other public institutions are still largely underutilized as places for exploratory action and experiential learning.

Learn, learn, learn. The learning cycle requires multiple steps. We must observe the outcomes of our actions, then reflect on them and compare them to similar situations to develop insight and make adjustments. One critical condition is the ability to comprehend the implications of our actions. Again, this point leads us back to the issue of balancing complexity and capacity. A second challenge is that major social settings are not particularly conducive to learning, which involves making mistakes and adjustments. Liability issues, reputation and peer pressure force us to buy into the grand narrative of our own infallibility.[26] A social movement as encompassing as sustainability cannot continue to celebrate this collective delusion.

Bringing everybody on board

Now, we seem to have everything ready to embark and sail off to the bright shores of sustainability. Not quite though. The common notion is that we build a ship and then bring everyone on board. Sustainability shifts this perspective too. We need to bring everyone on board *while* we are building the ship.

Involvement, participation and collaboration are central to sustainability. They are not just a means but an end in themselves as these processes are part of our sustainability visions. When considering the daunting sustainability challenges ahead, it becomes clear that solutions and opportunities can only be created by aligning all groups from government, business, academia and the civil society. We need to harvest knowledge, experiences, empathy and other capacities if we want to craft all the necessary components for an ambitious sustainability strategy and then implement it. This holds true even if the support comes from unlikely places and groups we would not have counted on. Pickiness is a luxury we cannot afford. At the same time, we need to go beyond engagement in the form of expert advice or eliciting stakeholder perspectives. High levels of interactivity are required to create robust outcomes and ownership that motivates action. This style of collaboration includes co-producing knowledge, joint fact finding, challenging basic assumptions and negotiating knowledge claims and value positions. Again, complexity will play a critical role. Agreement and successful coordination of actions is bound to a network of people who know and trust each other.[27]

New alliances require significant shifts in our willingness to cooperate by means of individual, collective and institutional commitments. These alliances push us out of our comfort zones as they substantially challenge our profiles and identities. In our universities, sustainability radically shifts what and how we research and teach, as spelled out in a founding document on sustainability science: "Pertinent actions are not ordered linearly in the familiar sequence of scientific inquiry, where action lies outside the research domain.

[24] http://sonomacounty.golocal.coop (visited March 15, 2010)

[25] Structuration theory suggests that society emerges and social change results from individuals and groups complying with or transforming social rules (Giddens, A. (1986). *The Constitution of Society–Outline of the Theory of Structuration*. Berkeley and Los Angeles: University of California Press.)

[26] Tugend, Alina. (2010, January 30). An Attempt to Revive the Lost Art of Apology. *The New York Times*.

[27] Elinor Ostrom has demonstrated that the number of agents is a critical success factor in sustainability governance: Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science*, 325, pp. 419-422.

[28] Kates, R.W., Clark, W.C., Corell, R., et al. (2001). Sustainability Science. *Science*, 291, pp. 641-642. Similarly challenging is the transformation of our higher education as spelled out in Rowe, D. (2007). Education for a sustainable future. *Science*, 317, 323-324.

[29] Arizona State University's initiative the "New American University" fosters the creation of new alliances with government, businesses, and the community (http://newamericanuniversity.asu.edu).

In areas [concerned with sustainability challenges], scientific exploration, and practical application must occur simultaneously."[28] This new academic mission requires the type of new alliances mentioned above: "Participatory procedures involving scientists, stakeholders, advocates, active citizens and users of knowledge are critically needed." Some universities have taken steps transforming the academic institutions and building new alliances to address the sustainability challenges we face.[29] Yet the process faces resistance and barriers, including one-dimensional academic success criteria, narrowly defined promotion and tenure standards, large class sizes, conservative pedagogy, traditional professor-student hierarchy, uninformed funding agencies and the rejection of individual responsibility for this transformative process.

Like the sorcerer's apprentice, we are entangled in our everyday machinery of exploitation, depletion and decline, unable to slow down or turn it off and yet, we are willing to buy into the illusion that change comes at no additional cost or effort. Hardly. Change will come with new patterns of consumption, production, trade, mobility, education and cooperation–if we actually become the change agents, responsible leaders and engaged citizens that we promise future generations to become.

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