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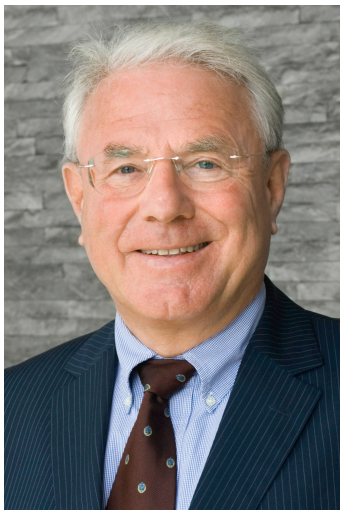
Corporate Sustainability, Global Values and Pluralistic Societies: What can we know? What ought we to do? What may we hope?

Klaus M. Leisinger



Klaus Michael Leisinger, founder and President of the Foundation Global Values Alliance, is Professor of sociology at the University of Basel (for development policy, business ethics and corporate responsibility), Special Adviser to the Global Compact of the United Nations for business ethics and the Post-2015 Sustainable Development Goals, member of the Consortium Board of the Consultative Group for International Agricultural Research (CGIAR), as well as member of the Leadership Council of the Sustainable Development Solutions Network launched by UN Secretary General Ban Ki-moon and directed by Prof. Jeffrey Sachs.

Foundation Global Values Alliance
Schönbeinstraße 23
4056 Basel, Schweiz

info@globalewerteallianz.ch | info@globalvaluesalliance.ch
www.globalewerteallianz.ch | www.globalvaluesalliance.ch

Corporate Sustainability, Global Values And Pluralistic Societies:

What can we know?
What ought we to do?
What may we hope?

The future cannot be a continuation of the past, and there are signs … that we have reached a point of historic crisis. The forces generated by the techno-scientific economy are now great enough to destroy the environment, that is to say, the material foundations of human life. The structures of human societies themselves, including even some of the social foundations of the capitalist economy, are on the point of being destroyed by the erosion of what we have inherited from the human past. We do not know where we are going. We only know that history has brought us to this point. However, one thing is plain. If humanity is to have a recognizable future, it cannot be by prolonging the past or the present. If we try to build the third millennium on that basis, we shall fail. And the price of failure, that is to say, the alternative to a changed society, is darkness.

Eric Hobsbawn[1]

Introduction

Eventually, the time has come when "sustainable development" is assigned the place it deserves in the international political discourse and practical transformation endeavors. After the Rio +20 Conference on Sustainable Development in 2012, thousands of experts, tens of thousands of government employees and civil society activists and millions of people all over the world are dedicating their energy to the initiation of reform processes helping to realize a "Future We Want for All".[2] In the coming months the international community will deepen the understanding of sustainability and create a consensus on a plan of action necessary to implement the 17 Sustainable Development Goals (SDGs) and the 169 associated targets.[3]

The goal of the sustainable development endeavors—very similar to the aspiration articulated in the Preamble of the Universal Declaration of Human Rights—is a *new common standard of practices*

1 Hobsbawm, E. (1996): The Age of Extremes. New York, p. 584 f.

2 UN System Task Team on the Post-2015 UN Development Agenda (2012): Realizing the Future We Want for All. Report to the UN Secretary General. New York. Of course today's sustainability discourse has a much longer history, see: Leisinger, K.M. (1998): Sustainable development at the turn of the century: perceptions and outlook. In: International Journal of Sustainable Development, Vol. 1, No.1 pp. 73-98. The modern sustainability discourse builds on the wisdom of scientific grandfathers and grandmothers like A.C. Pigou, Th. Veblen, K. William Kapp, Irma Adelman and Cynthia Taft Morris, and also on the work of the Brundtland Commission "Our Common Future".

3 See the zero draft "Transforming our World by 2013: A New Agenda For Global Action". Draft for adoption at the UN Summit in September 2015:

for all peoples and all nations, to the end that every individual and every organ of society, keeping the necessity for a sustainable development path constantly in mind, shall strive to promote coherent action and implement state-of-the-art national and international measures progressively, to secure universal and effective recognition and observance. The primary responsibility for sustainable development lies with every one of us—no governmental regulation can substitute individual environmental and social awareness and respective conduct. Small changes among the 1.5 billion people at the top of the global income pyramid with regard to e.g., the use of energy, water, non-renewable raw material, or the mobility patterns will make a bigger difference to global sustainability than a UN resolution or government regulation would ever be able to.

And yet, national governments and their administrations can facilitate and accelerate behavioral changes by mobilizing domestic resources e.g. for sustainable infrastructure and renewable energy, set the appropriate purchasing priorities and allocate the resources available to them coherently. The extent to which this "plan of action for people, planet and prosperity" will be implemented also depends on the willingness of the developed countries to fulfill their official development assistance commitments, in order to enable transfer of technology and help finance appropriate infrastructural investments.

More than ever before, success of sustainability endeavors depends on multi-stakeholder partnerships that "mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries" (Point 17.16 of the Zero Draft). It is in the context of such multi-stakeholder partnerships that the corporate sector—the single most efficient source of economic activity and innovation—is expected to support the collective global reform journey. Large international corporations can and should play a leadership role in this respect. The goals are ambitious; the international community is committed to

- end poverty and hunger;
- secure education, health and basic services for all;
- achieve gender equality and empower all women and girls;
- combat inequalities within and between countries;
- foster inclusive economic growth, shared prosperity and sustainable lifestyles for all;
- promote safe and inclusive cities and human settlements;
- protect the planet, fight climate change, use natural resources sustainably and safeguard our oceans;
- strengthen governance and promote peaceful, safe, just and inclusive societies; and
- revitalize the Global Partnership for Sustainable Development.

There is no blueprint, no straightforward solution valid for all countries under all circumstances to achieve economic prosperity, social inclusion and cohesion, and environmental sustainability. From a sustainability perspective all countries are "developing" countries, albeit in different ways. There are substantial similarities in regard to aspects of poverty and the need for interventions in poor countries. There are also structural resemblances with regard to the resource-intensive production, consumption and mobility patterns of rich societies. And there is an overarching need for improved governance. But despite all of this, the content and timing of action plans for sustainable develop-

ment remain context-specific and a consequence of the complex interaction of local economic, social, political, ecological and cultural factors.

Sustainable development is a normative concept in as much as there are a number of dilemmas that have to be addressed by deciding which of the economic, social, ecological, human-rights-specific and cultural values at stake should take precedence in a concrete situation. Priorities assigned in such decision processes depend on values, worldviews and the variety of diverging interests of the different stakeholders involved. To construct a tailor-made reform process that satisfies all relevant stakeholders is already difficult for a modern pluralistic society such as Switzerland, Germany or the United States—it becomes far more complex if we take into consideration countries such as China, India, Brazil or sub-Saharan countries with their differing stages of socio-economic development. Context-specificity and normativity apply also to companies: The scope, content, structure and speed of corporate sustainability processes depend on the size, sector, geographical location, profitability, political and cultural operating context.

From all we know today, the implications of a continued unsustainable development path will be more poverty, widening inequalities, less food security, more sickness and premature death, more weather extremes and eventually also more civil strife and war due to an increasing scarcity of vital resources.[4] This makes the implementation of the Sustainable Development Agenda, i.e. achieving the SDGs, not only a national and international technical, economical or political issue but also a *moral obligation* for everyone capable of making a contribution. I will therefore approach my suggestions in a way recommended by Immanuel Kant in his *Critique of Pure Reason*, namely with the following three questions: [5]

1. What can we know?
2. What ought we to do?
3. What can we hope for?

1. What can we know?

Most of the knowledge about the root causes of our currently unsustainable development path and the reform processes necessary to steer spaceship Earth into a *future we want for all* is easily accessible.[6] There are some issues in which scientists continue to disagree. As a way of dealing with the lack of full scientific certainty, however, the international community accepted the *precautionary principle* [7] at the Rio Conference on Environment and Development in 1992.

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4 Jeff Sachs gives an excellent overview on all relevant problems and their causes as well as the reform processes necessary to change course, see Sachs J.: The Age of Sustainable Development. Columbia University Press, New York 2015.

5 Kant I.: Kritik der reinen Vernunft 2. (Werkausgabe Band IV, edited by Wilhelm Weischedel) Suhrkamp Frankfurt 1968, S. 671ff. English translation: The Critique of Pure Reason, Penguin Classics, 2007.

6 Sachs J.: The Age of Sustainable Development. Columbia University Press, New York 2015.

7 "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." (Article 15 of the Rio Declaration on Environment and Development)

We also know that the context-specificity, the inter-generational aspects and the normativity of sustainable development issues make the life of political and corporate decision makers difficult: They all face significant incentive problems as they must make decisions that result for themselves and others in

- paying for investments or higher user fees today which have only a very long-term return for anonymous people and occur mostly far away from home;
- accepting concrete inconvenient changes in accustomed production and consumption habits today for a minuscule long-term benefit elsewhere and in the future;
- putting up with potentially uncomfortable restricted patterns of individual mobility today for an infinitely small contribution to the prevention of problems in the future, and, especially for politicians;
- inflicting short-term burdens today on electoral constituencies by which they want to be re-elected for long-term change and benefits far beyond the election cycles.

The burden of costs and inconveniences is incurred immediately while their possible returns only emerge in the longer run—and probably for different people at different places in the world. This does not fit into the usual pattern of individual, political and corporate decision-making. All of this makes achieving sustainability a "wicked problem"[8]— "wicked" not in the sense of being *evil,* but because the problems are tricky, devious, messy, ambiguous, interacting and evolving in a dynamic societal context. Part of the wickedness is caused by the fact that a huge number of people was involved in the genesis of the problem and has to be included in the solution attempts. To "tame" a problem of the complexity, dimension and wickedness presented by the overcoming of the current unsustainable development path, multiple stakeholders all over the world need to be involved: civil society organizations representing the people affected, governments, multi-lateral institutions, academia and the private sector.

Obviously sustainable development depends not only on enlightened corporate leaders doing the right thing, but also on a good governance framework that strives for the internalization of external costs. The power of market forces can only be used for sustainability if the prices express the ecological and social truth. It also depends on consumers to align their purchasing power with the available knowledge. To accelerate this process, sustainability education and training is necessary starting at primary school and progressing all the way through to university studies in order to shape public awareness about the sustainability requirements.

Having said this, we shall concentrate on the role of corporate leadership. Corporate decision makers can know that *legality* is only the non-negotiable ethical minimum. As in many countries local legislation fails to keep up with the progress of knowledge about sustainability, enlightened managers are not content with observing merely the ethical minimum. Living up to the necessities of sustainable development—let alone assuming a leadership role this reform process—involves much more than a legalistic "compliance definition" of corporate sustainability responsibility. Leaders will therefore strive for *legitimacy* in their conduct. This means first and foremost integrating sustainability in all organizational processes and using available knowledge and capabilities to continuously align

[8] Horst Rittel and Melvin Webber developed the concept of "wicked problems" for complex social-environmental problems and contrasted them with "tame problems" which are clearly definable and can be solved with pre-existing modes of data research pathways, decision preparation and decision making. See Rittel H.W.J. and M.M. Webber (1973): Dilemmas in a General Theory of Planning. In: Policy Sciences Vol. 4, pp. 155-169.

strategies, policies, practices and technologies of all those involved. This will facilitate coordination and collaboration, create synergies in "doing things right" and simplify innovation.

Enlightened corporate leaders are aware of the necessity, the usefulness and the power of *stakeholder dialogues and partnerships*. They are *necessary*, because different knowledge, skills, experiences and resources become available, *useful,* because they offer an opportunity to advocate and defend one's own legitimate corporate interests and *powerful* because unorthodox coalitions can trigger new business models. Unorthodox dialogue partners questioning customary "self-evidentialities" and predominant ideologies (e.g. the dominance of the *shareholder value principle*) create an atmosphere in which new thinking can develop. Enlightened corporate leaders know that a *business as usual* approach to managing corporate affairs is not sufficient to initiate and support the necessary global change of course, nor is looking at corporate sustainable development exclusively through the lens of short-term "profitability versus non-profitability". The consequences from accumulated knowledge about sustainability must be new practices.

2. What ought we to do?

Acting with integrity and in the spirit of the "Golden Rule"

The first idea that strikes sensible bearers of responsibility in the business world in connection with the question "What ought we to do?" is: "Acting in a way which is in line with the available knowledge and in accordance with one's personal value convictions—in other words: Acting with integrity". A second thought that comes to morally sensitive business leaders is: "Live up to the spirit of the Golden Rule"[9] in an intergenerational manner.

Reflections of Top Management

To comprehend what integrity and the Golden Rule mean in concrete practical terms, a fundamental reflection on sustainability values is necessary. Likewise a deep understanding of the shared aspirations of the Sustainable Development Agenda and the background of the goals set by the international community must be part of this process. This non-delegable obligation of the top management is "*half of the whole*".[10] With the achievement of a full understanding of the problem an essential part of the solution has already been found.[11]

Most of the companies I know went through such a reflection process when they produced their mission statement and values catalogues in the nineteen seventies and eighties, as was the fashion then. If no strategy revision, merger or diversification acquisition followed, the mission statement usually landed in the "done" file or in the company archives. This is not how it should be: changed economic relationships resulting from globalization, different social expectations and

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9 The Golden Rule is the ethics of reciprocity known in all ethical traditions since the early contributions of Confucius and part of all religions either as the passive rule: "Do not treat others in ways you yourself would not want to be treated" or the active version: "Treat others as you would like others to treat you".

10 Aristotle made this statement in the context of his political writings. It is also valid for entrepreneurial policy.

11 Eucken, W. (1952): Grundsätze der Wirtschaftspolitik (edited after his death by Edith Eucken and K. Paul Hensel), Tübingen, p. 155.

increased sensitivity of people for ecological and social issues in modern societies should have made a periodic examination of the mission statement and the values catalogue a matter of course. Leaving the mission and values statements in the "done" file is totally inappropriate in the face of the challenges brought by the Sustainable Development Agenda. Among the questions an enlightened top management must answer in this regard at regular intervals are the following:

- What values do we stand for and what does that mean in the context of sustainability?
- What should the world look like that we wish to hand on to our descendants?
- What could be our corporate contribution to that kind of world?
- What rules in this respect govern priority setting in the case of dilemmas, for example between the size of short-term profits and the consideration of long-term ecological interests or social inclusion?

Such an internal reflection of top management leads to better insights if all relevant stakeholders have been involved. Understanding their issues and expectations, knowing their concerns and interests broadens and deepens the decision basis. Without a principled debate on such issues at the top level of management the corporate cultural compass cannot be aligned or employees committed. In such cases the burden of decision responsibility is shifted down to employees at a lower level of the hierarchy working under pressure of time and resources. This is not the right place as such decisions are most often not a *free lunch* affair, e.g. when

- the cheapest suppliers are *not* taken into account because of degrading working conditions or destructive environmental practices; or when
- locations in distant countries to which production has been shifted have conditions that are incompatible with a sober sustainability perspective, and consequences that cost money have to be drawn to deal with the deficiencies.

Given all the potential for future business opportunities and first adaptor cost advantages, reforms for sustainability can have negative effects on turnover, costs and ultimately on profits. Such negative effects cannot be compensated for in the short term - if at all - by gains in reputation and higher motivation of employees and customers. They are the price to be paid for integrity and as such an investment in corporate sustainability and credibility.

Values Management

A coherent practical follow up on these basic reflections is the initiation of a congruous, anticipatory, strategic sustainability values management process through which respective organizational governance is adapted and management systems extended. This primarily involves the inclusion of sustainability values and rules in the leadership principles of the organization, so that criteria such as ecological sustainability, social inclusion as well as human rights aspects[12] are placed alongside the variables of economic success in the decision matrix of the enterprise. Further decisive elements of sustainability values management are code of conducts and corporate sustainability guidelines as well as sustainability-sensitive criteria in regard to target-setting and performance appraisals to make all

[12] Most companies have not yet realized the importance of the UN Guiding Principles on Business and Human Rights. See http://www.ohchr.org/Documents/Publications/GuidingPrinciplesBusinessHR_EN.pdf. One of the noteworthy exceptions is UNILEVER, see http://www.unilever.com/sustainable-living/what-matters-to-you/advancing-human-rights-in-our-own-operations.html

bearers of responsibility accountable and to provide incentives for proper conduct. Sincere sustainability thinking impacts the entire corporate value chain, beginning with the sourcing of raw materials, transportation services, employment practices, environmental stewardship in the production processes, packaging, delivering, also impacting the use of products and services by customers all the way through to the final product disposal, reuse or recycling.

All new investments will undergo a sustainability-due-diligence-assessment and—where applicable—research and development objectives will be complemented with sustainability issues. In this way, out of the endless number of theoretically possible forms of action, those will be filtered out, prescribed and encouraged that can be considered legitimate and desirable from a sustainability perspective. There is (hopefully!) increasing evidence that sustainability values management does not have to depend on enlightened leaders' good will only, but has a positive impact on future business opportunities, reduction of risks, and improvement of societal acceptance (license to operate).[13] Once the "compass" is set, practical implementation begins:[14]

- Detecting and analyzing the areas in the business operations and supply chain where the likelihood of an either negative or positive impact on sustainable development goals is highest. A number of tools for *mapping hotspots* in the business operations and the value chain are already available.[15]
- *Defining Key Performance Indicators* against which progress can be measured in mitigating negative or strengthening positive impacts on the 17 SGDs.
- As not everything necessary or desirable can be done at the same time, *priorities* will have to be defined according to the significance of the impact.
- The setting of SMART (specific, measurable, achievable, realistic, time-bound) *targets* aligned with the SDGs helps to manage performance and—if proper baselines are available—creates transparency about the level of ambition.[16]
- *Communicating* results of corporate endeavors is a last and equally important step. If not only successes and progress are reported but also problems not solved, set-backs suffered and obstacles faced, communication will not only enhance the credibility of the work done but also show the complexity of the whole process. Whenever dilemmas cannot be avoided, they ought to be dealt with openly and transparently. The GRI principles for sustainability reporting provide a helpful framework.[17]

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13 See GRI/UN Global Compact/WBCSD (Eds.) (2015): SDG Compass. A Guide for Business Action to Advance the Sustainable Development Goals. New York (forthcoming).

14 Ibid.

15 E.g., the Human Rights Compliance Assessment (https://hrca2.humanrightsbusiness.org/Page-HumanRightsComplianceAssessment-35.aspx), Business Integrity Toolkit (http://www.transparency.org/whatwedo/tools/business_integrity_toolkit/0/) or the Poverty Footprint of Oxfam (https://www.oxfam.org/sites/www.oxfam.org/files/oxfam-poverty-footprint.pdf)

16 Pivot Goals has collected nearly 3600 environmental, social, and governance targets set by the Fortune Global 500 companies, see http://www.pivotgoals.com.

17 Stakeholder inclusiveness, sustainability context, materiality, completeness, balance, comparability, accuracy, timeliness and reliability, see https://www.globalreporting.org/resourcelibrary/GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures.pdf.

Complex problems do not have simple solutions.

There are forms of unsustainable business conduct that permit no compromise. This is the case when, in the interest of increasing profits or for any other economic reasons, human life is threatened, human rights and dignity violated, human health endangered, or if the integrity of creation is irreparably damaged. Such actions are irresponsible, indeed evil and therefore no areas for compromises or tolerance.

In practice, however, the question seldom arises as to what should be done in the best of all worlds or unconditionally avoided under the worst possible circumstances. Normally, human reality does not happen in 'black or white', but in 'grey' areas. There, as Max Weber pointed out in his 1918 lecture on *Politics as a Vocation*, most decisions have dilemma character, and

> "No ethics in the world can dodge the fact that in numerous instances the attainment of 'good' ends is bound to the fact that one must be willing to pay the price of using morally dubious means or at least dangerous ones—and facing the possibility or even the probability of evil ramifications. From no ethics in the world can it be concluded when and to what extent the ethically good purpose 'justifies' the ethically dangerous means and ramifications."[18]

To adequately judge business activities from a sustainable development perspective, a situation-ethics approach is often the right procedure. In such an approach respectful use is made of all the sustainability principles in order to evaluate which norms should be given which weight in the given situation. It is no longer a question of isolated analysis based on a single preferred economic, social, ecological or governance norm. Situation ethics represents an *all things considered* assessment, which weighs up all arguments before a decision is taken.[19] In such decision situations often compromises have to be reached—i.e. a desirable economic aspect might be "sacrificed" for an ecological or social aspect that in the given situation is considered to be more important. If we look at the sustainability agenda from a moral perspective, this means that a *moral compromise* has to be reached.[20] An *all things considered* decision could temporarily be the *best possible* or the *least bad option*. Using situation ethics is admittedly a dangerous tightrope act. If the search for shared values and a moral common sense is part and parcel of decision making processes involving such compromises moral dangers can be mitigated. Let us now turn to the last question from Immanuel Kant's canon:

3. What can we hope for?

"Our problems are manmade, therefore, they can be solved by man. And man can be as big as he wants. No problem of human destiny is beyond human beings. Man's reason and spirit have often

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18 Weber, M. (1918): Politics as a Vocation. Berlin, http://www.sscnet.ucla.edu/polisci/ethos/Weber-vocation.pdf p. 29.

19 Fletcher, J. (1966): Situation Ethics. The New Morality. Westminster John Knox Press, Louisville. Moral compromises differ from political or economic compromises in that the opposing parties do not simply meet "in the middle" and then all are satisfied. Moral compromises are characterized by the fact that something morally questionable is tolerated (for example damage to the breeding grounds of rare birds at an investment site or the acceptance of local labor norms corresponding to a level acceptable in OECD countries in the 1930s), but will, *all things considered*, nonetheless be regarded as justifiable for the time being.

20 On these points I have benefited greatly from reading Brenkert, G. (2009): Google, Human Rights, and Moral Compromise. In: Journal of Business Ethics. Vol. 85, pp. 453-478.

solved the seemingly unsolvable—and we believe they can do it again." This message that John F. Kennedy gave more than 50 years ago has never been more relevant. Whatever has to be done to change course and bring humanity back on a sustainable path of development—it has to be done by human beings. There are two main areas of hope in this respect; *first*, human beings all over the world integrate sustainability in the way they define a "good life" and "happiness", and *second*, human ingenuity brings about technological progress which helps to stretch the time span needed for eventually adopting voluntarily sustainable consumption, production and waste patterns.

The sustainability man (homo sustinens)

Evolutionary predecessors of modern humans, e.g. *homo habilis*, *homo erectus* or *homo sapiens* were able to survive and develop because they were innovative and able to adapt to changing circumstances. The shared understanding of the majority of scientists, representatives of civil society as well as a growing number of enlightened leaders from the corporate sector suggests that modern human beings—9.7 billion by the year 2050[21]—will also have to adapt their lifestyles if a substantial negative impact on the life and options of future generations is to be avoided. Humankind can do this.

In his *Oration on the Dignity of Man*[22] of 1486 Giovanni Pico della Mirandola described his idea of man in a beautiful poetic way. He characterized man as "the most wonderful creation of the world", "the intermediary between creatures, familiar of the gods above him, the lord of the beings beneath him, by the acuteness of his senses, the inquiry of his reason, and the light of his intelligence, he is the interpreter of nature, set midway between the timeless unchanging and the flux of time; the living union, the very marriage hymn of the world, little lower than the angels." And, Pico lets God tell man something important for all spheres of human decisionmaking, i.e.

> "with free choice and dignity, you may fashion yourself into whatever form you choose. To you is granted the power of degrading yourself into the lower forms of life, the beasts, and to you is granted the power, contained in your intellect and judgment, to be reborn into the higher forms, the divine."

Individual responsibility for sustainability cannot be shifted onto others and not doing "the right thing" despite knowing the consequences of not doing it cannot be attributed to a lack of good governance, wrong financial incentives or obstructive market circumstances. The hope is that human beings all over the world in all their professional and private roles accept responsibility for sustainable development and act coherently in their sphere of influence in a spirit of shared values and shared responsibility. The hope is that the comprehension of what is at stake should bring about the willingness of all actors all over the world to act coherently and to contribute in good faith to the endeavors of others.

Business has a pivotal role to play; significant progress will result only when companies go further than business as usual and integrate the Sustainable Development Goals into business strategies, research and development as well as into the development of innovative products and services. In the spirit of what Pat Werhane advocates with regard to "moral imagination"[23],

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21 http://esa.un.org/unpd/wpp/Publications/Files/Key_Findings_WPP_2015.pdf

22 See http://www.andallthat.co.uk/uploads/2/3/8/9/2389220/pico_-_oration_on_the_dignity_of_man.pdf

23 Werhane P.H. and B. Moriarty (2009): Moral Imagination and Management Decision Making. In: Business Roundtable Institute for Corporate Ethics. Darden Business School. Se also Werhane, P.H. (1999): Moral Imagination and Management Decision Making. Oxford University Press, New York.

corporate management must become aware that every business decision and action has a sustainability dimension—for practically all business decisions there are alternative options, options which are of greater value from a sustainability point of view. The mobilization of imaginative powers and the extension of the mental horizon sharpen the awareness for the use of existing room for maneuver for the *Future We want for All*. Integrity—commonly defined as acting consistently with one's knowledge and values—demands the implementation of corporate reform processes consistent with the ecological, social and (not merely) economic knowledge available. There is a robust consensus on globally shared values representing the common tie that binds humanity.[24]

Technological innovations for sustainability

Never before have science and technology progressed so fast. If one looks at the science-based technological advances achieved e.g. in the areas of *information and communication technologies*, *genomics, chemical engineering, nanotechnology* or *biology*, one realizes that what seems perfectly *normal in 2015* is incomparably more than what even optimists considered possible just a few years ago. With resources being priced properly and attractive incentives for research (intellectual property) provided, a new generation of products and services with totally new sustainability features will become reality. Resource-intensive and ecologically damaging goods will become more expensive and hence less attractive for use. The higher prices will encourage the search for substitution through innovation. If markets are made to work for the environment by applying full-cost pricing along with the polluter-pays-principle, ecological innovation will be encouraged on the product and process level.

When *The Limits to Growth*[25] was published in 1972, it received enormous attention—and stirred enormous fears. Today we know that the projections presented by Dennis Meadows and his colleagues underestimated the potential of economic feedback mechanisms and human creativity leading to improved technologies and substitution mechanisms. Yes, there are new problems humankind is currently not able to cope with, be it the acceleration in the accumulation of greenhouse gases or the reduction of biodiversity, but overall, things have developed in a positive direction: Despite a more than doubling of the world population over the past fifty years and a substantial increase in consumption, most metals, foodstuffs and other natural resources have become more available rather than scarcer over time. As most of the world's known reserves[26] went up, the prices (adjusted for inflation) of most natural resources came down. The main pollutants have lessened in most industrial countries, and air and water quality have improved. Micro-organic diseases such as smallpox, plague, cholera, typhus and the like, which threatened the lives and health of earlier generations in industrial countries, have been successfully conquered and are much better contained than they were fifty years ago. There is also spectacular progress in the management of diseases such as HIV and malaria; smallpox has been fully and polio nearly eradicated.

Will the future be so different? The answer to this question depends, according to the late Julian Simon, on the response to another question: Will the rate of technological development slow

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[24] For the discussion of global values and sustainability see Leisinger, K.M. (2014): Global Values for Global Development. Basel. (http://unsdsn.org/resources/publications/global-values-for-global-development/)

[25] Meadows, D. et alia (1972): *The Limits to Growth*. Universe Books, New York.

[26] "Known reserves" is a concept that depends on the current prices and current technologies and hence changes with new scientific discoveries, technological progress, and the recycling rate.

down?[27] He would argue today as he did twenty years ago: the pace of development of new technology is increasing. Hence, if the future differs from the past, the bias is likely to be in the direction of underestimating the rate at which technology will develop. The value and weight of "the ultimate resource,"[28] as Simon called *human ingenuity,* supported by the proper economic signals in a free society, are today still not properly taken into account when discussing sustainable development issues. Better technologies available today have already changed the definition of eco-efficiency, and more of the same is to be expected.[29]

Human ingenuity is the single most powerful force for sustainable development. Specific resources (e.g. copper) are no longer or significantly less needed for the particular services they can yield (such as the capacity to conduct electricity), since there are substitutes (such as optical fibers).[30] Amory Lovins made the same point long ago in arguing for the potential of energy efficiency.[31] If scientists are able to assemble atoms and molecules into new materials that can be substituted for a scarce resource, that specific scarcity becomes irrelevant. There is no reason to assume that similar mechanisms will not help to deal better with emission issues—it is something one can dare to hope. And yet, taking the *precautionary principle* seriously suggests not relying entirely on technological solutions—a change in consumption, production and waste patterns is unavoidable in the long-term.

Willy Brandt addressed an important message to his friends in the last days of his life:

> "Nothing happens of its own accord. And very little is lasting. Therefore be aware of your strengths and of the fact that each era requires its own answers and that you really must feel up to its expectations if you hope to achieve good things."

We know what is at stake; it is obvious what we ought to do—we may hope that we will succeed.

Appendix 1: Sustainable Development Goals

Goal 1 End poverty in all its forms everywhere.

Goal 2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

Goal 3 Ensure healthy lives and promote wellbeing for all at all ages.

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27 Simon, J.L. (1996): The Ultimate Resource 2. Princeton University Press; see Simon, J.L. (1995): The State of Humanity. Blackwell, Oxford.

28 Simon, J.L. (1996): The Ultimate Resource 2. Princeton University Press, Note 6.

29 See the publication from twenty years ago by von Weizsäcker, E.U., A.B. Lovins, and L.H. Lovins (1995): Faktor Vier. Doppelter Wohlstand—halbierter Naturverbrauch. Der neue Bericht an den Club of Rome. Droemer Knaur München. And, more recently, Weizsäcker E.U., K. Hargroves, and M. Smith (2010): Faktor Fünf. Droemer München.

30 Simon, J.L. (1996): op. cit. note 6, pp. 23-73.

31 See the early publication by Lovins, A.B. (1976): Energy Strategy. The Road Not Taken? In: Foreign Affairs, October 1976. See also Lovins, A.B. et alia (2011): Reinventing Fire: Bold Business Solutions for the New Energy Era.

Goal 4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
Goal 5	Achieve gender equality and empower all women and girls.
Goal 6	Ensure availability and sustainable management of water and sanitation for all.
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all.
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.
Goal 10	Reduce inequality within and among countries.
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable.
Goal 12	Ensure sustainable consumption and production patterns.
Goal 13	Take urgent action to combat climate change and its impacts.
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
Goal 17	Strengthen the means of implementation and revitalize the global partnership for sustainable development.