

Democracy, Standards, and Behaviors to Sustain Our Earth

By Dr. Greg Monty

Sustainability is truly difficult to attain. Sustainability is elusive even in its definition. Achieving sustainability therefore generates opportunities to apply democratic processes, to produce standards for everyone to follow, and to improve human behaviors. Climate Change is happening, and the earth might be threatened if sustainability doesn't soon become an important part of virtually every person's behavior on our planet. But how will people know that they are changing their behaviors for the better? Will this happen through standards alone? How can our democratic processes help achieve sustainability and reduce the environmental damage being done today? These questions will be explored below, and it will be seen that standards alone cannot insure sustainability, nor can a democratic process be the answer by itself. It will take a multifaceted effort that takes advantage of the best democratic processes, the best standards, the best leadership behavior, and the best training to produce a result that sustains our planet for future generations.

Sustainability is defined in Merriam Webster¹ as: "a method of harvesting or using a resource so that the resource is not depleted or permanently damaged." This definition is nearly impossible in practice to satisfy. Virtually all activities on earth produce a byproduct or waste, like carbon dioxide or other Green House Gases (GHGs). Even if a product is designed to be 100% recyclable, there is no guarantee that all product produced is actually recycled. Sustainability is a noble goal, but one that is difficult to achieve. However, this should not stop us from reaching for the ultimate goal: a sustainable life on earth that has no end in sight.

Further complication enters when trying to optimize the conflicting interests of disparate groups of people. Companies want to be profitable. Customers want to pay a low price for quality goods. Non-governmental organizations (NGOs) desire to protect the planet from environmental destruction. Other stakeholders have conflicting interests, and drafting a "requirements document" for any product will always be challenging, and will involve compromise from all interested parties. Sustainability is sometimes captured in slogans like "People, Profit, and Planet." However, achieving the three goals alluded to in this phrase is far more difficult than one might imagine. Consider the recently talked about goal of eating locally grown food. The idea stems from the concept that energy, and therefore GHGs, can be reduced. However, a more effective reduction of GHGs might occur if all Americans changed their diets to eat much less meat (a large cause of GHGs in the food chain). Therefore, just becoming a 'locavore' (someone who eats food grown or produced locally or within a certain radius such as 50, 100, or 150 miles) will not be the optimum behavior change for GHG reduction. Another example of confusion is seen in zero-energy homes. It is a good idea to build zero-energy homes (ones that need less energy than they can produce),

but would it not be better if homeowners scaled back their desires for over-sized homes? A detailed life-cycle analysis of home manufacturing shows that a larger home is the source of more GHGs in its construction than a smaller home. The point here is that it is not just the use of a product that is important, but the entire cradle-to-cradle life cycle analysis that must be comprehended. This is not always a simple calculation to make, and it will take great effort to educate the world's population about the trade-offs and to give guidance on the proper decisions to make.

How can one get close to 'perfect' Environmental Stewardship or Sustainability? It takes a concerted effort of many groups; it takes the full concert of democratic principles and processes, it requires behavior change on the part of many stakeholders; and it requires a set of standards that people can understand and employ to work toward the elusive sustainability goals. It is possible to be good to people and communities, make a profit for a company, and protect the planet at the same time, but it will take great cooperation, collaboration, and coordination.

Standards are being developed today to move us all toward sustainability. Individuals, companies, governmental organizations, industrial associations, consortia, standards development organizations, and others are creating these standards. These standards not only detail performance measures, but also the processes and best practices that might work well for a sustainable planet. The standards emerging today sometime conflict in the same market, may not have been developed with a consensus approach, may be narrow in scope, may not be publicly available, may not be assessable, or may have other serious concerns to stakeholders. There is a set of fundamental values that should guide standards development in sustainability: transparency; relevance; accuracy; completeness and consistency (TRACC). These values are stated clearly in the GHG Protocol from the Carbon Development Project.ⁱⁱ Values are required in a standard or conformity assessment program to insure that sustainability is being achieved. Transparency requires that the standard and data related to sustainability are available for critical review.

The sustainability movement (sometimes call a revolution) has been bolstered by a very significant effort in 'democratic process' around the globe. The 'democratic process' used throughout this paper refers to the fact that sustainability is being supported through legislative action (laws, directives), executive requirement setting (companies are establishing environmental policy goals), and judicial decisions (Some courts are imposing judgments, or are penalizing companies that don't comply with laws). We are also seeing the 'court of public opinion' being exercised by NGOs. The NGOs, like Green Peace, have shifted paradigms with environmental behavior and sustainability. NGOs are regularly citing companies for bad behavior, are publicizing this information,

and calling a great deal of attention to the ‘bad actors.’ Below is a photograph of the roof of a Hewlett-Packard (HP) building in California from July 2009.ⁱⁱⁱ Green Peace even painted the ‘sign’ with children-friendly paint. This antic got the attention of many media outlets, and placed great pressure on HP to give a thoughtful response.



NGOs are truly one of the greatest forces in the sustainability movement, and are acting in the assessor role today, most notably because of a dearth of conformity assessment bodies helping the cause today. NGOs are trying to verify or disprove environmental claims being made today by many large corporations. The legislative bodies such as the European Union (EU) have established a comprehensive set of directives and laws that are driving the behaviors of companies around the globe, not just in the EU. The list of directives enacted, in part, includes:

- RoHS (Restriction of Hazardous Substances)^{iv};
- WEEE (Waste of Electrical and Electronic Equipment)^v;
- REACH (Registration, Evaluation, Authorization of Chemicals)^{vi};
- Packaging^{vii};
- Battery^{viii}; and
- EUP (Energy Using Products)^{ix}.

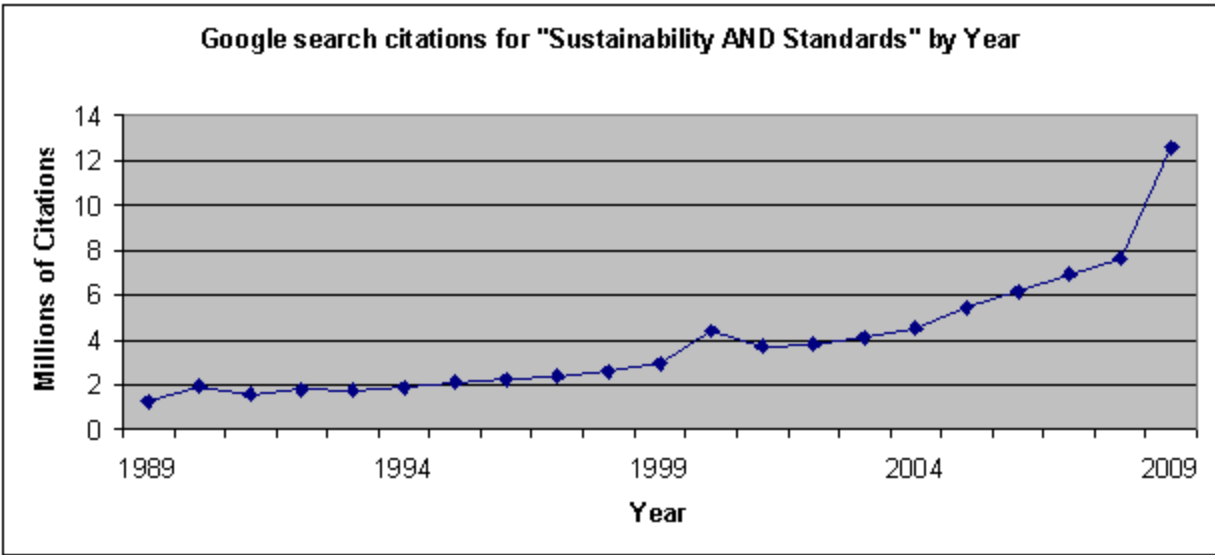
In addition to these legislative actions, a broad spectrum of important standards or guidance documents related to Green House Gases (GHGs)^x, Life Cycle Analysis (LCA)^{xi}, and Smart Grids^{xii} have been published. Consortia, companies, NGOs, or industry associations have drafted these latter requirements. The above listed documents have all been made publicly available, and have stood up to exceptional review and scrutiny. These documents have been listed here to make the strong point that sustainability must have governmental bodies in the process to succeed. No standards development organization (SDO) would have the expertise, nor be willing to take the risk to define

acceptable performance criteria everywhere in the supply chain. Materials like lead, cadmium, hexavalent chromium, mercury, and polybrominated flame-retardants in electrical equipment have had acceptable concentration levels established by legislatures around the globe. SDOs have not, and likely will not take the risk associated with these directives or laws by adding them to product standards. It is likely to stay this way for many decades to come. However, once the democratic legislative process has completed, there is still a crucial role played by the SDOs to develop tests, processes, guidance documents, and any other support information that are useful to companies in the process of complying with the laws being established globally in the environmental space. Executives (CEOs, COOs, Presidents) of companies across the globe are also establishing the 'local law or policy requirements' for their corporations. This is done to build confidence in their brand, while at the same time proving to their customers and investors that they are interested in profits, but not at the expense of people and the planet. These executives are helping establish the ground rules to become better environmental stewards. There is even a new executive position that has opened up in recent years at bigger companies: CSO (Corporate Sustainability Officer).^{xiii}

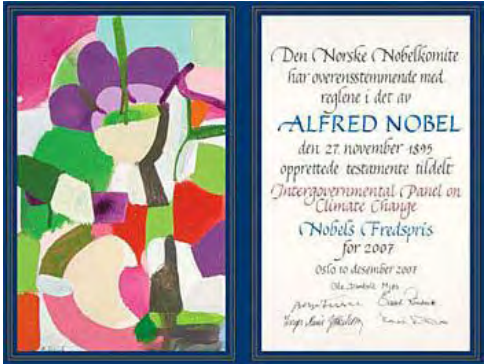
Below we will explore the sustainability movement from the recent past, talk about what it looks like today, address the major issues facing the effort to establish a sustainable planet, and speak about the best practices that may take us toward the elusive sustainability goals for earth. It will be shown that the process must involve close cooperation, collaboration, and coordination of people across the globe. We will likely reach our goals if we employ the best democratic processes along the way, establish clear standards to support established requirements for sustainability, and change behaviors of people through proper training and education. Our future generations depend on our success.

The Sustainability Movement In The Past 20 Years:

The world is truly waking up to the sustainability revolution. Although it is not a scientific study, below is a graph of the Google search results for "Sustainability AND Standards" by year from 1989-2009. The final data point for 2009 was estimated by scaling up the data from August 20th, 2009 (8.01M citations from January 1st to August 20th). There is clearly an explosion of Internet activity surrounding sustainability with ~10x growth in 'sustainability and standards' citations over the past 20 years.



Sustainability was not a household word in 1989, but it surely is today. GHG protocols were not developed until the late 1990s, and Al Gore had not produced his movie “The Inconvenient Truth.”^{xiv} This movie was a major inflection point in awareness to environmental issues and sustainability. Millions of tickets were sold for this documentary (revenue worldwide of ~\$50M), has had more than \$33M in DVD sales, and now it is widely viewed from rental stores and Internet providers like Netflix. The impact of this movie was so profound that Al Gore and the Intergovernmental Panel on Climate Change received, very soon after the movie was released (2006), a Nobel Prize in Oslo on December 10, 2007. A picture of the Nobel Prize certificate is shown below.



The inflection point in awareness came at a time when many important leaders across the globe did not embrace the theory that human behavior may be the cause of climate change.

The Sustainability Movement Today:

Today the situation around the globe looks very different. People and companies are aware. Many companies have enormous efforts in sustainability and have even hired a CSO to help them. GHGs are reported through ‘registries’ that provide public access to the reports.^{xv} A majority of the 500 largest corporations in the world are ‘voluntarily’ reporting their environmental performance on the Carbon Disclosure Project website for scrutiny by everyone.^{xvi} ‘Voluntary’ was placed in quotes because although the reporting is voluntary, if a company does not report openly and transparently their goals, objectives, and results, then NGOs and shareholders alike may scorn them. There is great external pressure on companies to show that sustainability truly means something to them, and it is incumbent upon those companies to demonstrate their improvements over time. Many companies have developed their own green labels to attempt to demonstrate their ‘green-ness’ to their constituents, customers, and shareholders. Unfortunately, this has led to a plethora of labels that many people don’t understand, or trust. Below is just a small sampling of the types of labels being put on products and literature today.



The major issues with these green labels are that they are not all built by consensus, are sometimes private to an organization, are not transparent, and the criteria for application are not clear to a customer. This is commonly called ‘green-washing.’ The customer has become wary of these labels, and does not place a great deal of confidence in companies that use them today unless they are validated, verified, or certified by an independent 3rd

party. SDOs know the reasons why this is not recommended practice because they understand that standards must be developed openly, with input from many stakeholders, and then those standards must be made available to virtually everyone, with a strong conformity assessment process behind the standard to demonstrate via a third-party that a company using the standard is truly meeting the requirements as stated therein.

So why have so many (hundreds) companies developed their own green labels? They were being pressured by constituents to demonstrate ‘goodness or green-ness,’ but no standards existed for them to simply start using. Instead of waiting for or driving for a standard via normal standards-development paths, they decided to move quickly on their own in hopes of building a loyal customer base that is concerned about sustainability. Other problems occurred with this explosion of labels. The labels most times dealt with single or just a few ‘sustainability’ attributes of a product. Virtually none of the labels was comprehensive and treated the entire product life cycle in their analysis. The labels have become very misleading, which is violating the principles established above related to transparency, relevance, accuracy, completeness, and consistency. Completeness is one of the overlooked values in this list for these private labels. Putting a green label on a product without considering the hazardous material content, the energy usage in manufacturing and product use, the waste produced during processing and at end-of-life, the packaging, water use, building GHG emissions, and other critical factors will not fully explain to a customer whether a product really meets criteria for sustainability. This area of labeling begs for a set of comprehensive standards to be written that take the guesswork out of the process, and defines ways to fully disclose the considerations and attributes, and allows for review and critique, as well as comparison to other analyses and products. Environmental Labeling is described in standards from ISO: 14020 (General Principles), 14021 (Type II Self Declared), and 14024 (Type I Third Party).^{xvii} The Federal Trade Commission has published Part 260^{xviii}, a portion of a ‘Green Guide,’ that provides examples of environmental marketing claims, and mandates substantiation while encouraging the use of 3rd-party validation or certification. These standards and publications are fighting back on ‘green-washing.’ It truly is hard to imagine that this area of sustainability will ever get real traction unless conformity assessment processes are established to validate or certify that a company has met requirements in one or more standards before it affixes a label to a product to be put on the market.

The breadth of sustainability requirements is almost overwhelming. Today, many companies need to comply with RoHS, WEEE, REACH, EUP, Battery, Packaging, LCA, LEEDs, GHG, Smart Grid, and other requirements/laws to be truly sustainable with their products. This is no small task, and most of these laws do not

have cast-in-stone standards associated with them to demonstrate ones compliance with the law. Standards and conformity assessment schemes still need to be built today. A negative example to make a point is that RoHS came ‘into force’ in July 2006, but the IEC 62321 analytical testing standard^{xxix} didn’t get published until 2009. For nearly five years, companies were testing for hazardous substance content using test methods not defined in any standard.

Other signs tell us that the world has finally started to embrace sustainability. Electric cars are no longer something of the far-distant future. They can be purchased today, and will be available in volume production in 2010. Solar and Wind power solutions are being installed globally, and the growth in these market segments is huge.^{xxx} The development of the Smart Grid in the USA and in the EU is accelerating rapidly, and this will take sustainability to higher levels. The standards development effort here is substantial, and has been driven by the Obama administration with the help of the DOE, NIST, and hundreds of subject matter experts from companies around the globe.^{xxxi}

Carbon is quickly becoming a tradable commodity. Cap and Trade systems have been and are being established globally^{xxxii}, and these financial markets will demand that standards be established to enhance the ‘quality’ of the commodity that they intend to trade on the open market. Can one imagine the results if the Chicago Climate Exchange were trading Renewable Energy Credits (RECs) that weren’t real, or were somehow being double counted? Standards have been written to attempt to deal with these issues, but have not been fully tested yet. Conformity assessment programs will also need to be established by reputable 3rd-party certifiers to make these programs in trading carbon a reality. Unfortunately, there are multiple standards in the world today that treat the counting of Carbon emissions slightly differently, and the standards groups that have proposed these standards will need to converge and iron out the differences in these standards before global trading of Carbon will see explosive growth.

Other important events are taking place in the world today. The former president of the USA, Bill Clinton, has established the Clinton Climate Initiative^{xxxiii}, a Clinton Foundation^{xxxiv}, and is active in the C40 Cities program^{xxxv} that brings 40 of the largest cities in the world together to address the reduction of GHG emissions. Some of the signature logos or brands for these activities are shown below.





Beside the C40 cities, the country of Abu Dhabi is building a place called Masdar City. This is going to be a city of 50,000 people that is 100% green and sustainable. The effort is fully underway, and the demonstration of systems and sustainability will be a testament to what we can do if we put our minds to it. There is a website devoted to Masdar City that gives updates on the progress being made.^{xxvi}



Another excellent sign of the times we live in today is that universities have established extensive programs in Environmental Stewardship, and in Sustainability. Students are being taught a full curriculum of courses that will help them graduate and help companies and communities meet the increasing demands placed upon them to be sustainable with their products and buildings. We may not have become a sustainable planet yet, but indications are that a critical mass of effort is now focused on the problems at hand.

Issues And Opportunities For Sustainability:

Many of the issues related to sustainability have already been mentioned in the text above. To strengthen the focus on these issues, they are listed again, in part, here:

- Green-washing is prevalent
- Transparency, relevance, accuracy, completeness, and consistency are not practiced everywhere
- Many standards or guidance documents have been published or developed in a competitive environment, and have not been independently assessed to suggest best-in-class approaches
- Many standards and labeling schemes are being developed by ‘interested parties’ that stand to benefit from the use of their standard or guide
- Self-declaration with very weak surveillance or validation/certification exists today
- Legislative consistency across the globe does not exist in sustainability laws and regulation
- Many standards have yet to be developed
- The education and training of most people has yet to be accomplished

A Sense That We Are Moving In The Right Direction:

Despite the list of issues that remain, much progress has taken place. Awareness has been achieved by a critical mass of people on earth. Standards have been, and are being written. Some standards and practices are emerging as the ‘winners’ because they have been deemed ‘best-in-class.’ The ‘Green’ movement is growing rapidly. People are taking action today, and that is in distinct contrast to 10 years prior when very little was being done to address sustainability on the planet. Governments are establishing laws and regulations that will push sustainability toward goals established around the globe. Finally, there is a great debate and development ongoing in ‘sustainable processes’ that can be adopted by most people on earth.

Standards, Processes, Training and Assessment Will Stimulate Sustainability:

We have already seen that there almost is a ‘wild, wild west’ mentality prevailing in the sustainability market. Many organizations and governments are establishing requirements or laws/directives. Some standards development has begun, but is far from completed. Standards and conformity assessment efforts will help to tame the divergent mentality prevailing today. One way for standards and SDOs to support the goals of sustainability is to step in to lead efforts at combining the best of all ideas into consensus standards that bring synergy across the globe. This will not be a simple task, but appears necessary.

The foundational core values of transparency, relevance, accuracy, completeness, and consistency must be applied in standards. A good starting point is for an expanded use of existing international Standards such as those in the 14000 series from ISO. Below is a listing of the standards that have already been published within ISO that deal directly with the environment.

- *ISO 14001:2004 Environmental Management Systems – Requirements with Guidance for use*
- *ISO 14004:2004 Environmental Management Systems – General Guidelines on Principles, Systems, and support techniques*
- *ISO 14020:2000 Environmental Labels and Declarations*
- *ISO 14021:2001 Environmental Labels and Declarations – Self-declared environmental claims (type II environmental labeling)*
- *ISO 14024:2001 Environmental Labels and Declarations – Type I environmental labeling – principles and procedures*
- *ISO 14025:2000 Environmental Labels and Declarations – Type III environmental declarations*
- *ISO 14040:2006 Environmental Management – Life Cycle Assessment – Principles and Framework*
- *ISO 14044:2006 Environmental Management – Life Cycle Assessment – Requirements and Guidelines*
- *ISO 14050:2002 Environmental Management – Vocabulary*
- *ISO 14064-1:2006 Greenhouse gases — Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals*
- *ISO 14064-2:2006 Greenhouse gases — Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements*
- *ISO 14064-3:2006 Greenhouse gases — Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions*
- *ISO 14065:2007 Greenhouse gases — Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition*

These ISO 140xx environmental standards^{xxvii} address management systems, labeling and declarations, life-cycle assessments, vocabulary, and GHGs (quantification, monitoring, reporting, validation, verification, and accreditation). BSI has published BS EN 16001:2009 dealing with Energy Management Systems – Requirements with guidance for use.^{xxviii} There are others as well, and it would be wise to bring together the best of these standards into one that can be adopted broadly around the globe. At the very least, there should be an effort to insure that the processes do not diverge significantly.

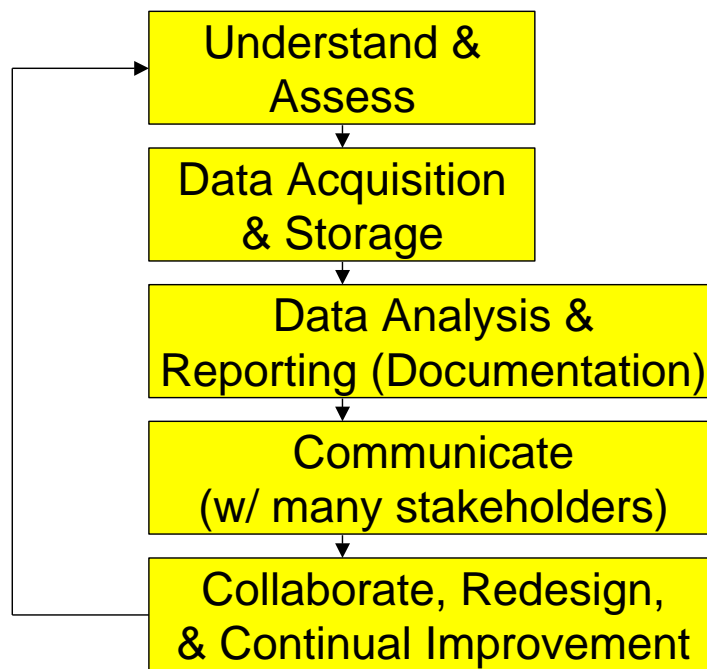
In parallel with the processes being established for people to follow, the government will be generating rules, regulations, directives, and laws for organizations to follow. Again, some effort to remain consistent across the earth is recommended.

Standards can support the processes by establishing ways for organizations to comply with the requirements. Some important standards that must be produced in a transparent, relevant, accurate, complete, and consistent fashion include, in part:

- Definition of testing procedures;
- Definition of data sets to measure and store;
- Methods of storage for data;
- Protocols for sharing of data electronically;
- Templates for reporting;
- Analysis of existing standards and guidance for use;
- Assessment procedures for all areas relating to environmental sustainability;
- General guidance for all existing legislation and procedures; and
- Training/education that should help to insure that the values of sustainability are learned and practiced globally.

This effort will take many years, will involve democratic thinking, will take leadership on an international level, and will require compromise by all interested parties along the way. One could relate what needs to be done to Steven Covey's Seven Habits of successful individuals or organizations.^{xxix} There needs to be a transition from independence to interdependence. Reaching sustainability globally will require interdependence and the ability to capture and use all the best ideas in the world. Inclusiveness is required, and sustainability may not be reached without this high level of cooperation. Warring tribes will fail.

It is very likely that the hundreds of 'green' labels with unknown meaning today and limited consumer confidence may be forced from the marketplace to leave only those with the integrity of meaningful standards behind them. This will likely benefit both the companies and their customers by insuring the levels of transparency, relevance, accuracy, completeness, and consistency required. It is suggested here that the following process might suit the development of sustainability standards and processes in support of established requirements (primarily set by governments and corporations):



This flow chart has similarity to the fundamental principles established in the Plan-Do-Check-Act process of continual improvement. Organizations (including SDOs) will need to first ‘understand and assess’ the present landscape. Are the fundamental values of sustainability fully defined with processes and performance criteria? What gaps exist? Standards bodies have a role of filling those gaps. Once that has been accomplished, ‘data acquisition and storage’ needs to be addressed. What data is needed? How and where will it be stored? How will it be retrieved and shared? This is a primary role for SDOs to fill. If the fundamental TRACC values have been included, then the process of ‘data analysis and reporting’ should be possible to define for the global marketplace. Standards for communicating with stakeholders are also needed. Finally, the important continual improvement process will need to take place in the ‘collaborate, redesign, and continual improvement’ phase. The loop circles back to the top of the chart since this process of improvement never ends.

The Sustainability Of Planet Earth Depends Upon A Democratic, Standards-Based Approach:

When one thinks about the fact that the sustainability movement touches every product sold in the world from food, clothing, transportation, housing/buildings, consumer products, and the rest, one can quickly grasp that any requirements and standards will need to be broadly applied and flexible enough to support all product groups. This is truly the grand challenge facing the sustainability movement: Can democratic bodies and standards-setting bodies work in concert to stimulate behavior change that helps sustain our planet? There are plenty of examples where standards have tackled difficult challenges, and although the challenge of sustainability is broad, involves virtually every human on earth, and is inherently difficult, it is indeed the perfect place for Standards and Standards Development Organizations to step in and take the lead. Our earth and our future generations are counting on us to make it happen in an efficient and cost-effective manner. Let's all lend our standards expertise to these noble sustainability goals. Our lives will be better, forever.

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- ⁱ Mirriam Webster's Collegiate Dictionary 10th Edition, ISBN 0-87779-708-0, 1993.
- ⁱⁱ Green House Gas Protocol for Project Accounting, <http://www.ghgprotocol.org/standards/project-protocol> .
- ⁱⁱⁱ William Shatner and Greenpeace leave HP a reminder, Jul. 28, 2009, <http://www.greenpeace.org/international/news/hp-reminder-28-07-09>
- ^{iv} The RoHS Directive, Restrictions of the use of certain Hazardous Substances in electrical and electronic equipment, Directive 2002/95/EC of 27 January 2003, (OJ No. L37, 13.2.2003, p. 19).
- ^v Waste Electrical and Electronic Equipment (WEEE) Directive, Directive 2002/96/EC of 27 January 2003, (OJ No. L37, 13.2.2003).
- ^{vi} The REACH Directive - Registration, Evaluation and Authorisation of Chemicals, European Union, 10 July 2007, ISBN Cat No FX-AL-07_136-EN-C.
- ^{vii} European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste.
- ^{viii} Directive 2008/103/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2006/66/EC on batteries and accumulators and waste batteries and accumulators as regards placing batteries and accumulators on the market.
- ^{ix} Directive 2005/32/EC on the eco-design of Energy-using Products (EuP), Official Journal of the European Union (L 121 22.7.2005), http://ec.europa.eu/enterprise/eco_design/dir2005-32.htm
- ^x Green House Gas Protocol for Project Accounting, <http://www.ghgprotocol.org/standards/project-protocol> .
- ^{xi} European Commission, <http://lca.jrc.ec.europa.eu/lcainfohub/toolList.vm>, extensive list of LCA tools available from around the globe.
- ^{xii} NIST, National Institute of Science and Technology, smartgrid home page, <http://www.nist.gov/smartgrid/>
- ^{xiii} CSO, "Chief Sustainability Officers: The New Corporate Stewards of the Environment, by Nina Emkin, January 25, 2008, Vol. 01: No. 09: Dec/Jan 2008 , <http://www.verdexchange.org/node/119>
- ^{xiv} An Inconvenient Truth is a 2006 documentary film, directed by Davis Guggenheim, about former United States Vice President Al Gore's campaign to educate citizens about global warming and inspire them to take action.

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- The film premiered at the 2006 Sundance Film Festival and opened in New York and Los Angeles on May 24, 2006. Al Gore and U.N. climate panel win Nobel Peace Prize, <http://www.msnbc.msn.com/id/21262661/>
- xv The Climate Registry, North America's leaders solving climate change together, <http://www.theclimateregistry.org/>
- xvi Database of responses from companies that filed a Carbon Disclosure Project questionnaire, <http://www.cdproject.net/responding-companies.asp>.
- xvii ISO, International Organization of Standardization, ISO 14000 essentials, http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000/iso_14000_essentials.htm
- xviii Section 5 of the FTC Act to environmental advertising and marketing practices, Part 260 -- Guides for the Use of Environmental Marketing Claims, <http://www.ftc.gov/bcp/grnrule/guides980427.htm> .
- xix IEC 62321:2008, an International Standard, specifies the determination of the levels of lead (Pb), mercury (Hg), cadmium (Cd), hexavalent chromium (Cr(VI)) contained in inorganic and organic compounds, and two types of brominated flame retardants, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE) contained in electrotechnical products.
- xx Solar, Wind and Biofuels' Impressive Growth Surge in '08, <http://seekingalpha.com/article/125281-solar-wind-and-biofuels-impressive-growth-surge-in-08> .
- xxi NIST, National Institute of Science and Technology, smartgrid home page, <http://www.nist.gov/smartgrid/> .
- xxii Chicago Climate Exchange (CCX) operates North America's only Cap and Trade System for all six greenhouse gases, with global affiliates and projects worldwide, <http://www.chicagoclimatex.com/content.jsf?id=821> .
- xxiii Clinton Climate Initiative, homepage, <http://www.clintonfoundation.org/what-we-do/clinton-climate-initiative/>
- xxiv The Clinton Foundation, homepage, <http://www.clintonfoundation.org/>
- xxv C40 Cities Climate Leadership Group, homepage, <http://www.c40cities.org/>
- xxvi Masdar City, homepage for project, <http://www.masdar.ae/en/home/index.aspx>
- xxvii ISO, International Organization of Standardization, ISO 14000 essentials, http://www.iso.org/iso/iso_catalogue/management_standards/iso_9000_iso_14000/iso_14000_essentials.htm
- xxviii BS EN 16001:2009 Energy management systems. Requirements with guidance for use, <http://www.bsi-global.com/en/Shop/Publication-Detail/?pid=00000000030172146>
- xxix The Seven Habits of Highly Effective People, first published in 1989, by Stephen R. Covey.