the NATURAL STEP

Alberta Sustainability Primer

Step by Natural Step

Acknowledgments

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the Natural Step

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About This Document

Sustainability is about creating the kind of world we want for ourselves, our neighbours, and future generations. It challenges us to live our lives and make decisions as individuals, organizations and societies so that we make sure that future generations have access to the same opportunities and quality of life that we do.

The purpose of this primer is to cut through the confusion surrounding the term 'sustainability' and provide the reader with an overview of:

1. *The root causes of 'unsustainability' in the world today;*
2. *An internationally recognized, science-based definition of sustainability; and*
3. *A strategic framework for applying sustainability in day-to-day planning and decision making.*

This primer describes 20 years of thinking about what sustainability is and how to achieve it. It is grounded in best practices, rigourous science and the contributions of thousands of experts, business professionals and community leaders from around the world. The good news is that we already have all the knowledge, tools and resources we need to create a sustainable world. The bad news is that time is running out and we are desperately short of the leadership we need to make real change happen. The challenge to all of us is to inspire and become the sustainability champions that are needed to lead this change and create a better tomorrow.

GLOSSARY

As you read this primer, you may come across terms and concepts that are new to you or that are used in a different way than you may be familiar with. The Natural Step's online glossary is a good resource to refer to throughout your reading and can be accessed here: www.thenaturalstep.org/en/canada/glossary.

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Introduction

"We thrive and survive on planet earth as a single human family. And one of our main responsibilities is to leave to successor generations a sustainable future."

–Former United Nations Secretary General Kofi A. Annan

No one reading this primer can have escaped the news headlines of recent decades, which seem overwhelmingly to tell the story of a world that is getting more dangerous, more divided, and more complex to live in. Glaciers are melting and causing sea levels to rise; babies are being born with unprecedented levels of toxins in their bodies; and millions of people are dying of poverty-related illnesses each year. As of 2009, the global economy is in recession, and all of our global ecosystems are either under stress or in decline.[1]

Amid these and many other alarming trends, it can be hard to maintain a sense of hope for the future. Even if we manage to address one problem, the rest remain so overwhelming that it can be difficult to imagine the kind of real change that is needed for us to feel good about the world we will leave to our children and grandchildren.

What if we could create a different kind of future? What if we could leave a legacy of hope for future generations by creating a world full of thriving ecosystems and communities? A world where clean water, safe streets and meaningful work are the norm rather than the exception? What would it take to create a future like that?

The promise of a better world is the promise of sustainable development. It presents both an enormous opportunity and the greatest challenge of our time.

Sustainability: What is It?

In 1987, the United Nations convened the Brundtland Commission to address growing concern about the decline of environmental systems and the consequences for economic and human development. The resulting report gave us what is now the most common and widely accepted definition of sustainable development: "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[2]

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The Brundtland definition brought the discussion about the way we live and plan for the future to a new level of international debate. It also prompted many to ask a deeper question: Where is our global society headed today, and what needs to change in order for our development to become sustainable?

The goal of this primer is to help shift sustainability from something abstract that we want to something concrete that we can plan for. Scientific reasoning helps us to see that we must avoid degrading both our ecological and social systems in order to survive and prosper into the future. Based on this understanding, we can ask:

- What are the basic problems that make our global society unsustainable?
- How are we contributing to these problems?
- What can we do today and tomorrow to stop contributing to these problems?

This primer brings together two decades of scientific and social research to answer these questions. It is grounded in best practices and is based on the contributions of experts, business professionals and community leaders from around the world.

The Sustainability Challenge

"The defining challenge of the 21st century will be to face the reality that humanity shares a common fate on a crowded planet."

–Jeffrey Sachs, Economist and Director of the Earth Institute, Columbia University

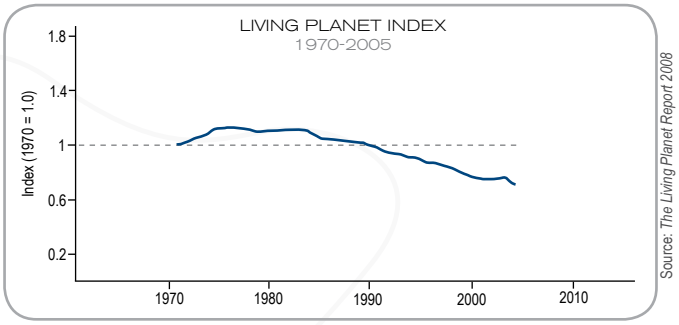
The Brundtland Report helped achieve a global consensus that society, the economy and the environment are inextricably linked. This means that human well-being is fundamentally dependent on the health of our environment.

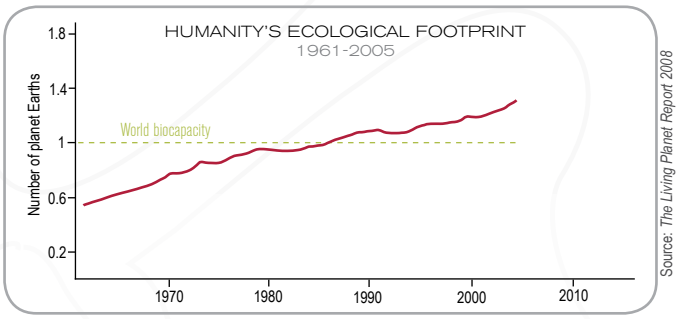
Yet we are undermining our environment at an alarming rate. The Living Planet Index, which measures the health of the planet's ecosystems, shows that they have been in steady decline since the mid 1980s. Reports by thousands of researchers and scientists from around the world tell us that human activity is putting such a strain on our environment that the earth's ability to sustain us can no longer be taken for granted.[3]

On a global scale, we're already seeing the consequences: the collapse of fisheries around the world is threatening lives and livelihoods; the loss of arable farmland is contributing to global food insecurity; and shrinking supplies of clean water mean many more people are vulnerable to preventable diseases like cholera and diarrhea. Climate change, in particular, has emerged as a defining challenge of the 21st century. By 2050, as many as one billion people could lose their homes because of water shortages, crop failures, and rising sea levels.[4] Urgent action is needed now if we wish to avoid these problems.

At the same time that natural resources are disappearing, our demand for them is increasing. The Ecological Footprint calculates how much of the planet's ecosystems are needed to produce the resources we use and absorb the waste we create, and it shows that our global demand for resources and ecosystem services has been rising steadily over the past 30 years. It tells us that our demand on the planet's living resources is already 30% greater than its capacity to regenerate those resources.[5]

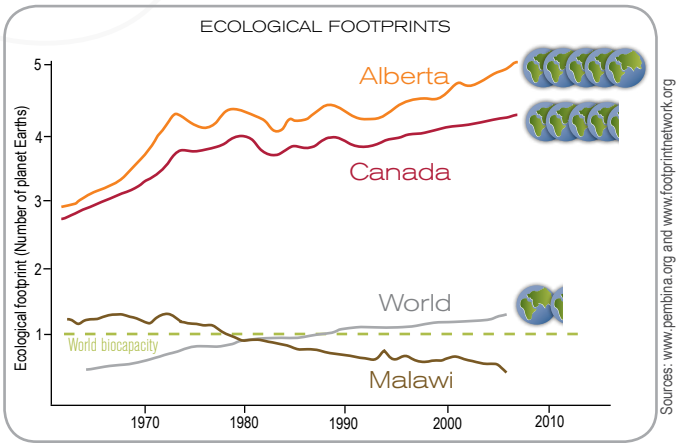
Yet despite consuming more resources than ever before, we are not meeting the most basic human needs of more than a billion people: half of the world's population lives on less than $2 a day and more than 800 million people go to bed hungry each night.[6]





The main problem isn't an absolute lack of resources; it is the fact that our global consumption of resources is extremely uneven and inefficient. It may be hard to believe, but the richest 200 people in the world have a combined annual income that is greater than that of the poorest 2.5 billion people.[7]

Canadians are among the most privileged people on the planet. If everyone on earth consumed resources the way the average Albertan does today, we would need five planets to support ourselves. In contrast, if the world lived like the average person in Haiti or Malawi, humanity would be using only a quarter of the planet's biological capacity. Clearly, the balance lies somewhere in between these two examples.[8]



The Funnel Metaphor

Based on current trends, human society as a whole will demand twice as much as our planet can support by the mid 2030s.[10] The truth is, that while the past century has brought extraordinary improvements in human health and medicine, public education, and material well being, the unintended side effect of our progress has been the destruction of ecosystems, the undermining of human needs, and a way of life that cannot continue for much longer. The consequence of living beyond the planet's means is that ecosystems are being run down, resources are disappearing and waste is accumulating in the air, land and water. The resulting impacts – such as clean water shortages and climate change – are putting the well-being and development of all nations at risk.

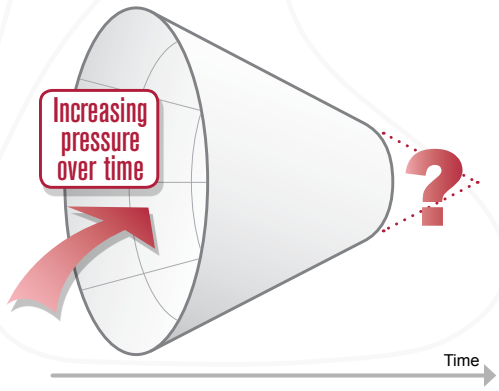
A simple way of visualizing these challenges is to picture a funnel. The walls of the funnel represent the increasing pressures on us – our growing demand for resources and ecosystem services, the declining capacity of the earth to provide those resources and services, stricter governmental laws and consumer pressure, and the social tensions resulting from abuses of power and inequality.

The most important element of this metaphor is the systematic nature of the pressures we face. There are many different problems, but the overall trend is that these problems are becoming increasingly common and increasingly severe because they are a direct result of the way our society grows and develops.

For example, the real challenge is not that we are consuming natural resources, but that our society is **systematically increasing** our consumption year after year. In the process, we're also **systematically decreasing** the ability of natural systems to provide the resources and services we need. Even though we know we are running out of fish and trees and oil, we keep investing more energy and resources into finding, processing and consuming them. And we often don't stop until the system breaks down – just look to the collapse of the Atlantic fishing industry for an example. Similarly, while we know that the growing gap between rich and poor is contributing to social tensions, violence, and an undermining of human needs, we often focus on building more secure borders rather than challenging our own ways of living.

The concept of the funnel – of things getting worse and the opportunities for change becoming more limited over time – is obviously frightening. But it's also hopeful. It is a reminder of the great opportunity that exists for those who can help us redesign the way we live and move us in a more sustainable direction. It also makes it clear that there is no better time to act than now.

METAPHOR OF THE FUNNEL



Pressure on society increases over time due to our growing demand for resources and ecosystem services, the declining capacity of the earth to provide those, stricter governmental laws and consumer pressure, and the social tensions resulting from abuses of power and inequality.

SUCCESS STORY

The Co-operators is a leading Canadian-owned multi-product insurance company. As part of an industry that identifies and manages risk, the company recognizes that climate change and other unsustainable trends are serious threats both to the planet and their business operations. Over the past 50 years, the narrowing walls of the funnel have had a direct impact on The Co-operators: the cost of the damage resulting from natural disasters has doubled every five to seven years and climate change has emerged as the number one threat facing the insurance industry. The Co-operators recognize that their success will be dependent upon their ability to fully embrace sustainability in all aspects of their operations. Among other achievements, they have introduced socially responsible investment options and new insurance products catering to the non-profit/voluntary sector, owners of windmills, and drivers of hybrid electric vehicles.

Visit www.thenaturalstep.org/en/the-co-operators for more.

A Look at the Big Picture

"It really boils down to this: that all life is interrelated . . . Whatever affects one directly, affects all indirectly."

-Martin Luther King, Jr., Civil Rights Activist, Author

In order to understand what's behind our sustainability challenges, we need to step back and look at the big picture, see the connections, identify the root causes of our problems and find the leverage points for change.

Humans have an incredible capacity for problem solving. Our challenge is that we tend to address problems as if they are one-time issues that can be fixed with a new technique, a new medicine, or a new technology. In fact, most of our big problems are interconnected through the complex human, economic and environmental systems that make up our world.

We often try to understand these complex systems by studying their individual parts, and we try to solve our problems by using linear thinking. The reality is that systems consist of **individual but interrelated parts**, and they depend on the relationships among those parts as much as the parts themselves. These relationships make the **whole greater than the sum of its parts**. If you don't look at the system as a whole, you miss the pattern of relationships; in other words, you don't see the forest for the trees.

This teaches us that the best way to solve our problems is to look for the underlying 'system errors' that cause them in the first place. This point can be illustrated by the fable of a village called Downstream:

The residents who live in the village Downstream had built their community beside a river. Many years ago, they began to notice that growing numbers of drowning people were caught in the river's swift current. So they went to work inventing ever more elaborate technologies to save them. Talk to the people of Downstream today, and they'll speak with great pride about the hospital by the edge of the water, the fleet of rescue boats ready for service, or the large number of dedicated lifeguards ready to risk their lives to save victims from the raging waters. So preoccupied were these heroic villagers with rescue and treatment that they never thought to look upstream to find out why people were falling in the river in the first place.[10]

All too often, we act much like the villagers described here and invest enormous resources into tackling problems without taking the time to understand their root causes within the larger system. By venturing 'upstream' instead we have the opportunity to resolve problems before they happen and avoid the costs of dealing with 'downstream' impacts. In Downstream's case, they might have avoided the need to invest in lifeguards and rescue boats by simply posting a warning sign or building a bridge across the river upstream.

To get to the root of the many problems associated with sustainability, we need to begin by understanding the basic laws and principles that govern human and natural systems.

Photo by Nick Atkins Photography - Flickr.com

There are systems all around us. The human body, a city, a lake or even a hockey game are all examples. To study a system, you need to understand what its limits (or boundaries) are, what's inside those boundaries (its various parts), what goes in and out (inputs and outputs) and what happens inside (the relationships between each part).

One example of a system is a tree. Its main components are the roots, trunk, branches, twigs and leaves, and its boundaries are its outer surfaces and bark. The tree's leaves capture energy from the sun to fuel its growth, and the roots of the tree absorb water and nutrients from the soil. All of these parts have to work together to keep the tree healthy and strong.

Defining Human Needs

The Brundtland definition of sustainability as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" raises some important questions: What is a human need? Do we all have the same needs? And how do we know if they are being met?

Given the importance of these questions, it's not surprising that researchers from around the world have committed their lives' work to trying to answer them. One of the most respected of these researchers is Manfred Max-Neef, a Chilean economist and winner of the prestigious Right Livelihood Award. Max-Neef has defined nine fundamental human needs which are considered to be universal across all cultures and historical time periods. They are: subsistence, protection, affection, understanding, participation, leisure, creation, identity and freedom.[11]

One way to understand this list is by asking yourself the following question: "What would happen if I were to be completely deprived of one of these?" Max-Neef points out that no one of these fundamental human needs can be substituted for another and that a lack of any one of them represents a poverty of some kind. For example, no amount of affection can make up for the absence of food.

Nor is a need the same as a want or a desire – you may *want* caviar, but what you *need* is subsistence, and what you do to fulfil this need will depend greatly on your income, culture, location and social network. Each of the nine needs must be met if people are to remain physically, mentally and socially healthy.

Creating a sustainable society does not necessarily mean creating a utopia where every single person's needs are met at all times. From a sustainability perspective, the problem is that we are creating ongoing structural barriers that actually prevent people from being able to meet their own needs. These barriers are rooted in our global political and economic systems, and include the abuse of political power, of economic power and of the environment.[12] Examples include discriminatory government policies, wars, businesses that promote the exploitation of child labour and waste management practices that pollute community water supplies.

Clearly, removing these barriers around the world is an incredibly complicated and difficult task that may not be achieved in our lifetime. But the first step in any journey is choosing a destination. Success in a sustainable society means that we are not systematically undermining people's capacity to meet their basic human needs.

FUNDAMENTAL HUMAN NEEDS

Subsistence	Protection	Participation
Idleness	Affection	Understanding
Creativity	Identity	Freedom

Photos by (from left to right and top to bottom): gussifer, emms76, Dieter Drescher, Pikaluk, teointarifa, bhardy, Carf, MaxLow.com and LunaDiRimmel - Flickr.com

The Rules of Nature

In order to create a sustainable society, we need to understand that we must operate within natural laws and principles rather than attempting to overcome them. Scientists agree on the following non-negotiable facts about the earth:

1. The earth is a closed system with respect to matter. Nothing enters or leaves (aside from the odd meteor or rocket), which means everything that was here two billion years ago is still here today. **There is no away**: matter can change form, but it doesn't leave.

2. The earth is an open system with respect to energy. In fact, energy from the sun is the only input into the system. This energy enters our atmosphere and is released back into space in the form of heat. **The sun's energy drives everything**.

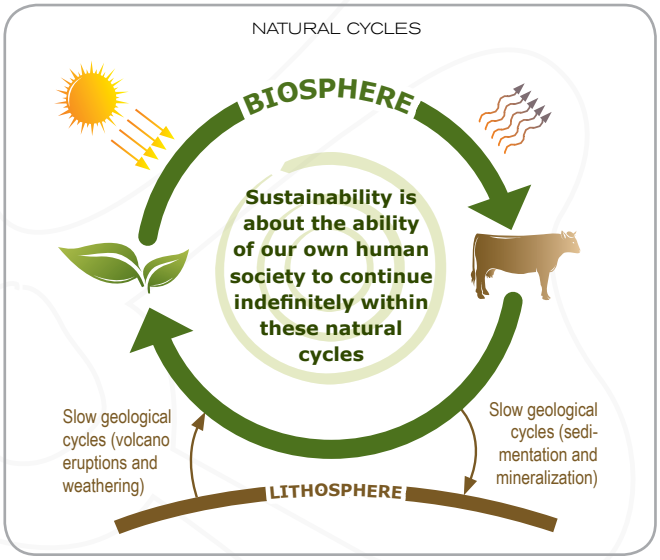
3. Life exists in the thin layer around the earth called the biosphere, which is as thin as the skin of an onion. **The biosphere is very fragile** – as we're learning almost daily, and there is only so much wear and tear it can take. And it is certainly rare. As far we know, there's only one just like it in the entire universe, and the more we learn about it, the more complex and beautiful it turns out to be.

4. Photosynthetic organisms (plants and some algae) capture the sun's energy and use it to power their growth. This growth supports the development of every organism on earth – in other words, **photosynthesis pays the bills**.

5. All life on earth depends on complex, self-regulating systems that circulate materials and energy in closed-loop cycles. Slow geological processes move materials from deep in the earth's crust (or lithosphere) to the biosphere and back again. Ecosystems in the biosphere rapidly cycle and recycle nutrients, water and energy from one organism to the next. **Nature works in efficient cycles where nothing is wasted**.

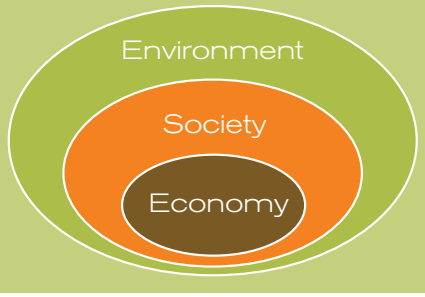
As a society, we need to start by understanding that all of our economic and industrial systems sit within the larger systems of nature. We depend on ecosystem services to regulate our climate and clean our air and water. We harvest renewable resources (such as trees and sunlight) and non-renewable resources (such as oil and uranium) to fuel our bodies and economies. Therefore, to be sustainable in the long run, human systems need to operate within the natural laws and principles that govern all life on earth.

In other words, success in a sustainable society means that we are not systematically undermining nature's ability to provide the natural resources and ecosystem services upon which all life depends.



BEYOND THE TRIPLE-BOTTOM-LINE

Many people think of the environment, economy and society as a 'triple bottom line' or a 'three-legged stool'. Instead, it is more useful to think of them as three nested and interdependent spheres. The largest sphere represents the environment, or earth, upon which all economic and social progress ultimately depends. That's our natural capital: it provides the ecosystem services and natural resources that we need to survive. The middle sphere represents society, or human capital. Our economy is the smallest circle because it is governed by the rules, regulations and structures of the other two spheres. The economy depends on human capital and natural capital to thrive. You can't have one at the expense of another.



A Look at Root Causes

"We can't solve problems by using the same kind of thinking we used when we created them."

-Albert Einstein

In the 16th century, many of the best thinkers in the world were certain that the earth was at the centre of the universe. This idea was based on two observations: that the sun, stars and other planets appeared to revolve around the earth each day, and that the earth itself appeared to be stable and solid.

When a mathematician named Copernicus shattered that idea by proving that the earth and other planets in the solar system rotate around the sun, people literally had to re-construct their entire world view. Rather than seeing the earth and its people as occupying the centre of the universe, they had to come to terms with the fact that they were just a small part of a larger, interconnected system.

Hundreds of years later, understanding the sustainability challenge requires the same kind of shift in thinking.

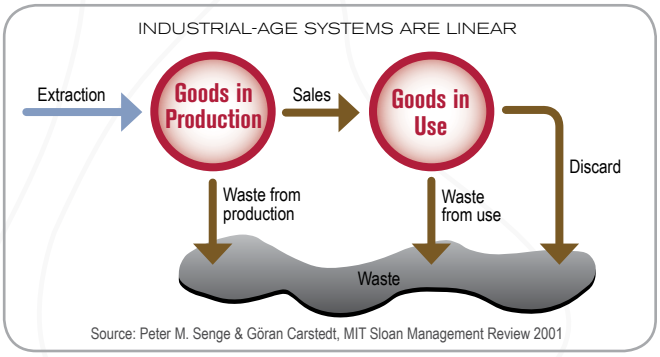
For centuries, we have been operating our economies based on the idea that we have unlimited natural resources to draw from, unlimited ecosystem services to support us, and unlimited places to put our waste. We have assumed that unlimited growth is not only possible, but that it is the only way to improve our quality of life and to meet human needs. This growth is fuelled by the assumption that we can find technological solutions to overcome any challenges that we run into along the way.

The result of these assumptions is an economic system that *takes* natural resources from the earth, *makes* products, and then disposes of them as *waste* when they are no longer useful to us. Whether you look at residential development, food packaging, car manufacturing, or water management, the approach is largely the same.

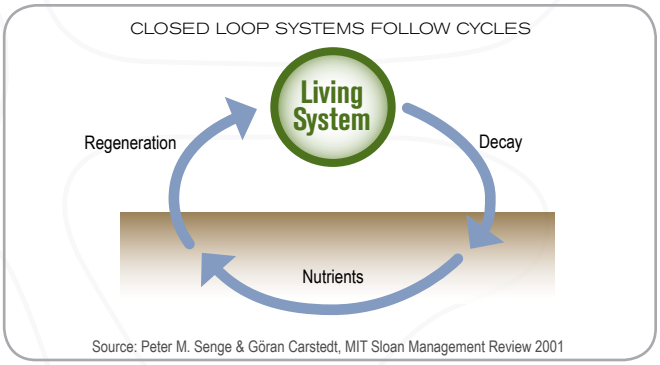
This *take-make-waste* dynamic is a design flaw. It is grounded in faulty assumptions which ignore the fact that our economy and society are part of a larger, interconnected system – the earth – and are completely dependent on the resources it provides. It is inefficient because it relies on a one-way, linear flow of resources rather than building on the elegance of nature's cycles.

And it is unrealistic because it assumes that we can have infinite growth in a finite world.

Most importantly, it is unsustainable because it systematically undermines the ability of the earth to provide the resources and ecosystem services that are needed to meet human needs both now and in the future.



Source: Peter M. Senge & Göran Carstedt, MIT Sloan Management Review 2001



Source: Peter M. Senge & Göran Carstedt, MIT Sloan Management Review 2001

SUCCESS STORY

Interface Inc. is the world's largest manufacturer of modular carpet. The company's dedication to sustainability is captured by their Mission Zero commitment — the promise to eliminate any negative impact they have on the environment by 2020. Led by founder and Chairman Ray Anderson, Interface has identified seven strategic goals, or fronts, to guide the company's actions toward sustainability: Eliminate Waste, Benign Emissions, Renewable Energy, Closing the Loop, Resource-Efficient Transportation, Sensitizing Stakeholders, and Redesigning Commerce. They call these their 'Seven Fronts of Mount Sustainability'.

Visit http://www.thenaturalstep.org/en/usa/interface-atlanta-georgia-usa to read The Natural Step case study on Interface. For more on Interface's Mission Zero commitment, see http://missionzero.org/.

System Conditions
for a Sustainable Society

"Only when I saw the earth from space, in all its ineffable beauty and fragility, did I realize that humankind's most urgent task is to cherish and preserve it for future generations."

–Sigmund Jahn, Astronaut

In the years since the first human space flights, many astronauts have described spending hours looking down on the planet and understanding, for the first time, that **what we do to the earth, we do to ourselves**. Imagine looking down on the earth from their vantage point. From this perspective, we would see the whole system and how our *take-make-waste* way of life has influenced human development and the biosphere.

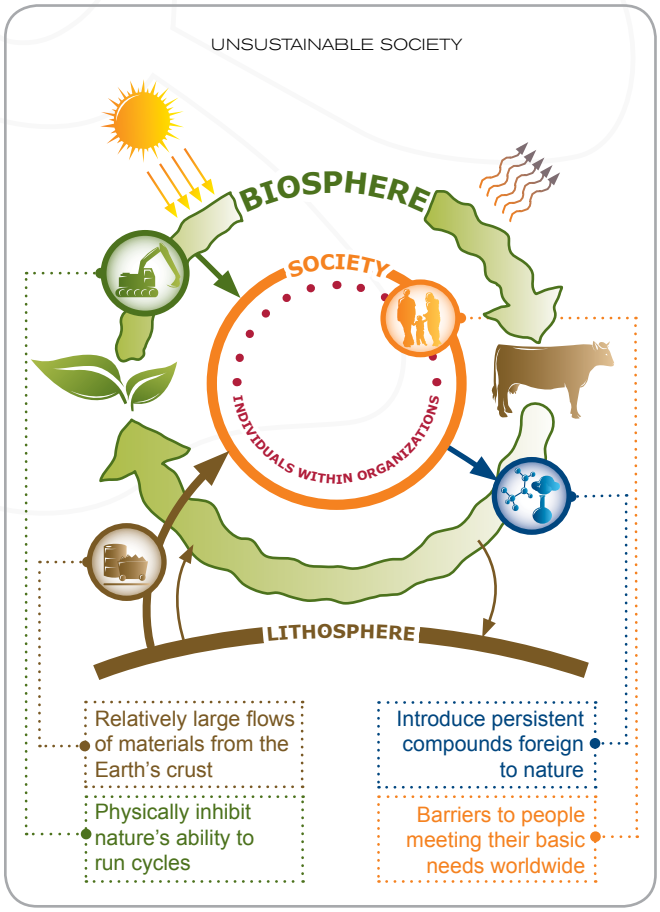
The Natural Step has spent the last two decades looking at the world from this whole-system perspective. They worked with an international network of scientists to develop a rigourous definition of sustainability (see *Sustainability Defined* on page 10). These scientists unanimously concluded that there are four fundamental ways that human society is systematically undermining the ability of nature to function and the ability of humans to meet their needs.

The first is related to the way we extract materials from the earth's crust and then deposit them in the biosphere. Some of these materials (such as granite) are relatively common in nature and pose little harm when they are deposited on the earth's surface. Others (such as heavy metals) are relatively uncommon and are toxic to most forms of life. Normally, these materials are brought to the earth's surface through extremely slow geological cycles, so the rapid pumping and dumping of these materials into our biosphere – by activities such as mining and oil and gas exploration – can overwhelm natural systems.

The second has to do with the vast amount of stuff that our society produces and allows to build up in the environment. This includes both natural substances (such as carbon dioxide and manure) and synthetic compounds (such as plastics and pesticides). Natural substances can cause problems when we produce them in large quantities that overwhelm nature's ability to process them. Synthetic compounds can cause problems because they are foreign to nature and often cannot be broken down and reintegrated within nature's cycles.

The third has to do with the physical impact we have on natural systems. We pave over productive bioregions, introduce foreign species, and over-harvest natural resources such as forests and fisheries. The problem is not that we change or harvest natural resources; we need these to survive. The real problem is that we use those resources at a rate faster than nature can regenerate them. This means that the 'pool' of resources from which we can draw is getting smaller and smaller. The result of conventional agriculture, forestry, urban planning and resource management techniques is an ongoing deterioration of nature and its ability to sustain us.

The fourth is a result of the way we organize our social systems. Abuses of political power and economic power make it possible for wealth and resources to be concentrated among a select group of people. The result is a global society that systematically undermines the majority of people's ability to meet their most basic human needs.



System Conditions for a Sustainable Society (continued)

When someone is starving, homeless or facing any other threat to their well-being, they usually cannot afford to be concerned about how sustainable their actions are. They may, for example, use pesticides or cut down trees to meet their short-term needs even if they know it is not in their long-term interest. And when our entire global society is consuming resources unsustainably, the people who are already struggling to meet their needs are the ones who will suffer the most.

Taken together, the three systematic ways in which we undermine natural systems and the systematic undermining of people's ability to meet their own needs are the four root causes of unsustainability on earth. When re-phrased, they describe the basic requirements for sustaining life as we know it – also known as The Natural Step System Conditions for sustainability.

SYSTEM CONDITIONS FOR SUSTAINABILITY

In a sustainable society, nature is not subject to systematically increasing...

...concentrations of substances extracted from the Earth's crust,

...concentrations of substances produced by society,

...degradation by physical means,

and, in that society...

...people are not subject to conditions that systematically undermine their capacity to meet their needs.

Principles for a Sustainable Society

The system conditions provide an overarching description of what is required to achieve a sustainable society. They can be re-worded as basic sustainability principles to help provide more explicit guidance for any individual or organization interested in moving toward sustainability.

The Natural Step Sustainability Principles state that, in a sustainable society, we will:

1. Reduce and eventually eliminate our contribution to the systematic accumulation of materials from the earth's crust.

   This means substituting our use of certain minerals that are scarce in nature with others that are more abundant, using all mined materials efficiently, and systematically reducing our dependence on fossil fuels.

2. Reduce and eliminate our contribution to the systematic accumulation of substances produced by society.

   This means systematically substituting certain persistent and unnatural compounds with ones that are normally abundant or break down more easily in nature, and using all substances produced by society efficiently.

3. Reduce and eliminate our contribution to the ongoing physical degradation of nature.

   This means drawing resources only from well-managed eco-systems, systematically pursuing the most productive and efficient use both of those resources and land, and exercising caution in all kinds of modifications of nature, such as over-harvesting and the introduction of invasive species.

4. Reduce and eliminate our contribution to conditions that systematically undermine people's ability to meet their basic needs.

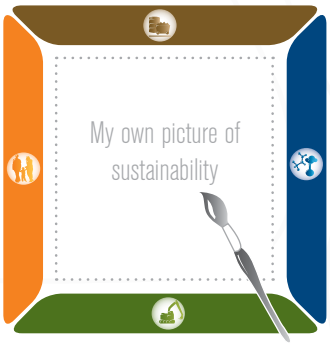
   This means offering products and services and changing practices, suppliers, and business models to those that ensure that human rights are respected, income-making barriers are removed, safe and healthy work environments are provided, and living conditions allow local communities to meet the needs of citizens.

At first reading, the system conditions and basic principles might seem to imply that we have to stop all mining, close all of our factories, shut down our pulp and paper mills and renounce our worldly possessions. But that's not what they mean.

Returning to the metaphor of the funnel, the sustainability challenge is to reduce the growing pressures caused by increases in consumption and decreases in ecosystem services and natural resources. It is the systematic nature of those trends that is causing the funnel walls to close.

So the problem is not that we mine and use heavy metals, or use chemicals and compounds produced by society, or disrupt natural processes, or even that some people are unable to meet their basic needs. It is, rather, that our economic and industrial systems are structured so that we systematically increase these activities year after year by taking, making and wasting and we systematically undermine people's ability to meet their own needs.

The principles provide the constraints within which society can operate sustainably. They can be viewed much like the four sides of a picture frame: inside the frame we can be as creative as we want. As long as we don't contribute to violating the system conditions, each of us is free to develop our own unique picture of sustainability.



SUSTAINABILITY DEFINED

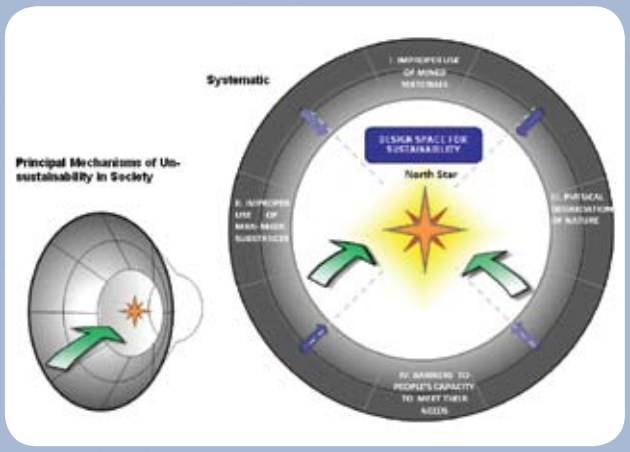
Development of the System Conditions

While examining cells from one of his cancer patients under the microscope, Swedish oncologist Dr. Karl-Henrik Robèrt was struck with a simple, but powerful idea. What if we could get agreement on a basic understanding of cells – and therefore a basic understanding of the requirements for the continuation of life? If we could agree on the basics, we could build consensus among governments, business people and environmentalists about what was needed to become sustainable. Dr. Robèrt drafted a framework outlining these conditions and sent it to a broad cross-section of scientists, including over 50 ecologists, chemists, physicists and medical doctors to ask for their input. Twenty-one drafts later, there was at last consensus about what is needed to sustain life on earth. This scientific consensus is the foundation for The Natural Step System Conditions for sustainability.

Visit http://www.thenaturalstep.org/en/our-story to learn more.

SUCCESS STORY

Nike Inc. has used sustainability principles to harness the 'just do it' mentality of the company in the service of sustainability. In 2008, the world's leading manufacturer of athletic footwear and apparel officially launched Nike Considered, an index that uses a lifecycle approach to examine design and production factors such as material selection, solvent use, garment treatments, waste, and innovation for footwear and apparel. Considered products are rated as gold, silver or bronze.



Already, the index has been a key leverage point for Nike designers, successfully channelling the company's competitive nature to focus on sustainable design innovation. It is rooted in the understanding that The Natural Step Sustainability Principles provide the 'rules of the game', or the constraints within which designers can innovate and improve performance.

Nike's goal is to have all footwear meet the bronze standards at a minimum by 2011, all apparel by 2015, and all equipment like balls, gloves and backpacks by 2020.

Visit http://www.naturalstep.org/en/usa/nike-inc-beaverton-oregon-usa-0 to read the case study.

Beginning with the Future in Mind:
Backcasting

"The future is not a road to be discovered, it is a place to be created."

–Göran Carstedt, Chair of The Natural Step International and Senior Director of the Clinton Climate Initiative

This first half of this primer has defined what sustainability is, described the root causes of our unsustainability, and outlined a set of principles for a sustainable society. The following sections focus on how we can plan, make decisions, and take action for sustainability. The first step is to understand the concept of 'backcasting' or *starting with the end in mind*.

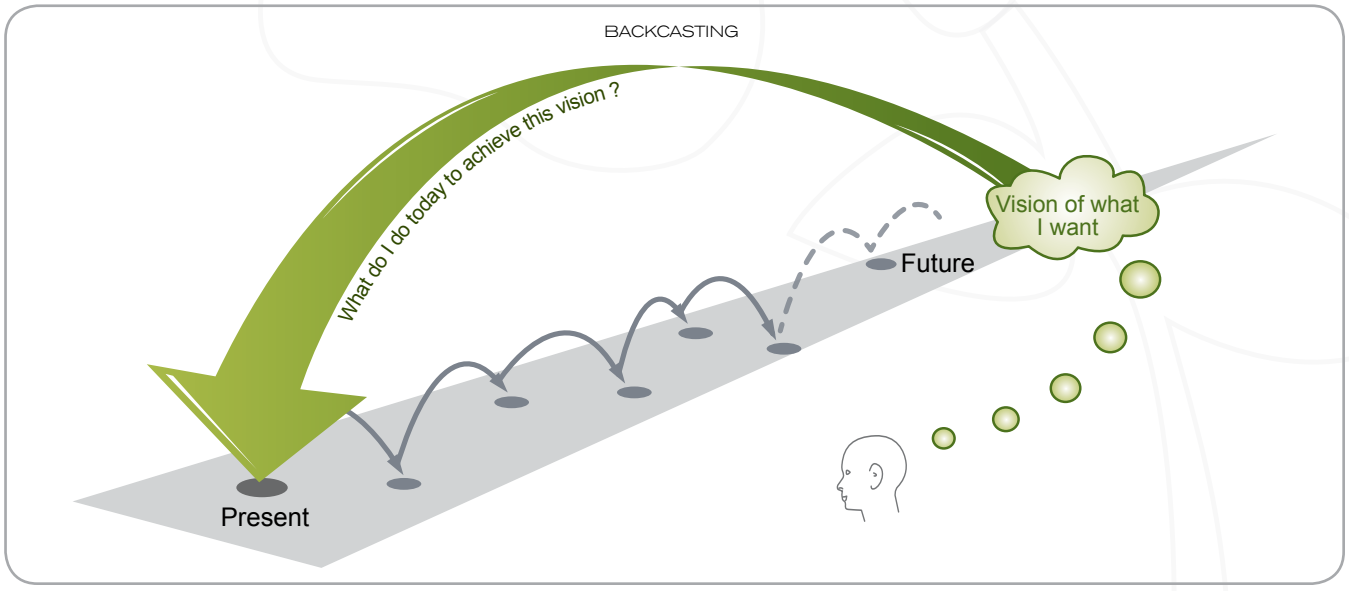
Backcasting is a fancy term for something we are all familiar with. It simply refers to the process of deciding on something we want in the future and then figuring out what we have to do today to get there. We usually backcast whenever we think about some future possibility, whether it be a change in career, buying a house, or planning for retirement.

For example, let's say that you are working as a dishwasher but want to become an electrician. There may be a number of options for proceeding, but it is likely that they will involve going to college, finding an apprenticeship, then passing your exams, and so on. Depending on your financial situation, you may need to put your studies on hold for a while in order to save money for school, but even this step is part of your overall strategy to arrive at success – becoming an electrician.

At the individual level, most of us backcast automatically because it is the most effective way of figuring out how to get from where we are today to where we want to be in the future. But when we plan for the future in larger groups, such as communities, municipalities or businesses, we tend to use forecasting instead. This involves using past information to establish trends and then developing a plan based on projecting them out into the future. For example, if we notice that a growing number of people are using the food bank, then we might plan to increase funding for it or even open a second food bank.

Forecasting is very effective if we are happy with how things are going. But what if we want – or need – a very different future than the one we are headed toward? That's when we need to backcast. Returning to the food bank example, we need to look upstream and backcast if we want to eliminate the need for food banks in the first place.

Backcasting is particularly useful when current trends are part of the problem that you're trying to address. In the case of planning for sustainability, backcasting is a useful methodology because of the complexity of the sustainability challenge and the need to develop new ways of doing things to address the challenge.



Backcasting also helps ensure that we move toward our desired goal as efficiently as possible. The focus on beginning with the end in mind means that planners start by agreeing on the conditions for a successful outcome.

Think about the last time you moved to a new home. You may have started by deciding on some conditions that would make the home a success, such as whether it was close to school or work, whether it had enough bedrooms, and how much it cost. After defining your criteria for success, you probably began to look for your home as efficiently as possible by using the conditions as a screen to determine which homes to visit. This way, you kept your options open but didn't waste any time looking at houses you couldn't afford or would never want to live in.

Similarly, the principles for sustainability help us identify the conditions for success in a sustainable society. Since the principles are the result of broad scientific consensus, they help frame a goal that people and organizations all over the world can share. If we can agree on those principles as the basic criteria for a sustainable society, they become our starting point and help us evaluate our ideas and plan for the future while making the most effective and efficient use of our resources.

Photo Canmore Civic Centre

Canmore's Civic Centre is the first building in Alberta to achieve a Silver LEED™ accreditation for sustainability.

Photo by Patxi64 - Flickr.com

In many ways, backcasting from principles is like a game of hockey. We don't know exactly what the game will look like, but we know what success is (scoring more goals than the other team). So we go about playing the game in a strategic way, working within the constraints of the rules of the game and always keeping that vision of future success in mind.

SUCCESS STORY

Canmore is a mountain town in southern Alberta that is using backcasting to make its vision of a sustainable future a reality. To this end, they have created a formal screening process to evaluate all proposed developments in the community.

Before developers can apply to have a land use amendment or permit approved, they must demonstrate that their project is aligned with the guiding principles of Canmore's vision and contributes to the social, economic and environmental sustainability of the community.

Since the policy came into force in 2007, all new developments have met green building standards and many developers have partnered with community organizations, resulting in donations to the town's affordable housing fund, formal 'adoption' of the local daycare, and support for a local workshop and art gallery co-operative.

For more, visit http://www.thenaturalstep.org/en/canada/town-canmore-alberta.

Planning for Sustainability

"A vision without a plan is just a dream. A plan without a vision is just drudgery. But a vision with a plan can change the world."

-Old Proverb

To create a sustainable society, we need both a vision of where we want to go and a plan for getting there. There are many ways to plan for sustainability, and The Natural Step process outlined below is only one of them. What makes this approach unique, however, is that it focuses on building a plan for sustainability based on the four sustainability principles and uses backcasting to evaluate each possible action for its strategic value. Although the process is described in terms of an organization, it can be applied at many different levels, from an individual to a nation. It can also be applied to product and process design. Whatever the scope or level, the process involves four basic steps: **A**wareness, **B**aseline Analysis, **C**ompelling Vision and **D**own to Action.

The steps are listed alphabetically as 'ABCD', but they are not meant to be followed in a linear way. Most people find themselves revisiting each of these planning steps many times as they move through a spiral of change. Throughout this process, the sustainability principles will help you to keep the end in mind as you tackle the multiple decisions involved in long-term planning. What's considered realistic and possible today shouldn't affect the direction of change, only its pace.

Awareness

Awareness involves creating a shared understanding of sustainability and a common sense of purpose among teams, departments and organizations. It is essential that everyone who participates in the planning process has a common understanding of what sustainability is and why our current system is not sustainable. This promotes greater cooperation and collaboration in designing innovative solutions and ideas.

Baseline Analysis

Once everyone understands what sustainability is and what it means for your organization, the next step is to look at where you are today. This involves completing a baseline assessment of the organization's current operations by looking at flows and impacts to see how

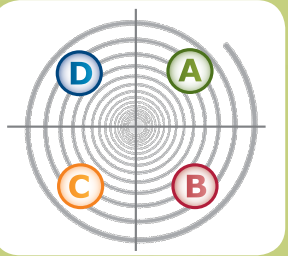
THE SPIRAL OF CHANGE: THE CYCLICAL NATURE OF THE ABCD

In practice, the ABCD process is cyclical, not linear, with each step helping to inform the others. For example, you may start simply by creating awareness (A) in a small group of key people, and those people may work to create a high level baseline analysis (B) and a draft sustainability vision (C) for input. During this time, this group may already begin to identify some early projects or prototypes (D) to implement. As the team learns from their prototypes and demonstrates that their early projects are successful, they may get support for more projects.

One of the key projects could be a broader training and awareness raising program (A) that targets the top managers in the organizations, as well as a more in-depth analysis of product lifecycles (B) and the development of strategic goals for the entire organization (C) based on the draft developed by the initial team. As part of the review of the process to engage people in the strategic goals, staff can be invited to provide ideas and resources to implement them (D), and so on.

As your group works through the ABCD process, you will:

- Generate increasing engagement and awareness of sustainability and its relevance to the organization (A);
- Clarify the gap between the current reality and your desired future. Looking back and forth between your group's aspirations and its current reality will help develop a creative tension between the two, sparking more ideas and innovations (B – C);
- Implement more and more smart moves toward sustainability, starting with the 'low hanging fruit' that are platforms for bolder initiatives in the future (D).



different activities are supporting or running counter to sustainability principles. The analysis includes an evaluation of products and services, energy, capital and human resources throughout the life cycle and looks at the social context and organizational culture to understand how to positively introduce change. This allows you to identify critical sustainability issues, their business implications, assets you already have, and opportunities for change.

Compelling Vision

At this stage, you need to consider what your organization could look like in a sustainable society. What is your description of success? And what are your opportunities for innovation? This is a creative and open-ended process that involves imagining what our organizations would look like in the future if we aligned our decisions with all four of the sustainability principles.

Ultimately, this brainstorming culminates with a compelling sustainability vision featuring bold strategic goals to mobilize the people in your organization. This translates the four sustainability principles into tangible goals based on your organization's unique values, services and external environment. They form the basis for your sustainability vision and serve as a compass to guide and orient all strategies and actions.

Photo by jarek69 - Flickr.com

The Fairmont Banff Springs Hotel is located in the heart of Banff National Park, a UNESCO World Heritage Site.

VISION OF SUCCESS

Many organizations have made sustainability goals a central part of their business. An example that is close to home is the **Fairmont Banff Springs Hotel** in Banff, Alberta. After receiving training in sustainability and The Natural Step Framework, the hotel developed a corporate vision which calls for "Providing treasured mountain memories on our way to a sustainable future." Their new policy includes seven strategic goals that help define their long term direction:

We envision a day when the Fairmont Banff Springs Hotel:

1. *Uses only renewable energy sources;*
2. *Is carbon-neutral, meaning no net carbon will accumulate in the atmosphere as a result of our operations;*
3. *Produces zero waste, meaning 100% of the materials associated with the hotel's operations will be re-used, recycled, or composted;*
4. *Uses only benign chemicals, meaning all chemicals and cleaning products will be non-toxic and degrade naturally without damaging nature or natural processes;*
5. *Partners only with suppliers who have a proven commitment to sustainable practices;*
6. *Purchases as many products as is feasible from local and regional suppliers;*
7. *Is a sustainability leader in the Fairmont Corporation, the hospitality industry, and in the community in which we work, meaning we will be acknowledged for innovative actions, pursuit of best practices, and that our colleagues will be actively engaged in promoting sustainability in the Bow Valley and beyond.*

The Fairmont Banff Springs has committed to preparing and implementing an annual action plan that includes objectives, actions, and internal progress indicators. Their first action plan represents the most strategic ideas from a list of over 60 possible actions, and will move forward in 2009.

For more on the Fairmont Banff Springs Hotel, visit http://www.thenaturalstep.org/en/canada/fairmont-banff-springs-hotel-canada.

Down to Action

This step involves charting out a plan to bridge the gap between where you are today and where you'd like to be as a sustainable organization. You can start by coming up with a long list of possible actions or investments, then prioritizing them based on what moves the organization toward sustainability fastest, while optimizing flexibility and generating sufficient returns. This supports effective, step-by-step implementation and action planning.

Actions and ideas should be screened against three strategic questions:

1. Does the action or investment move you in the right direction (toward your vision of sustainability and alignment with sustainability principles)?

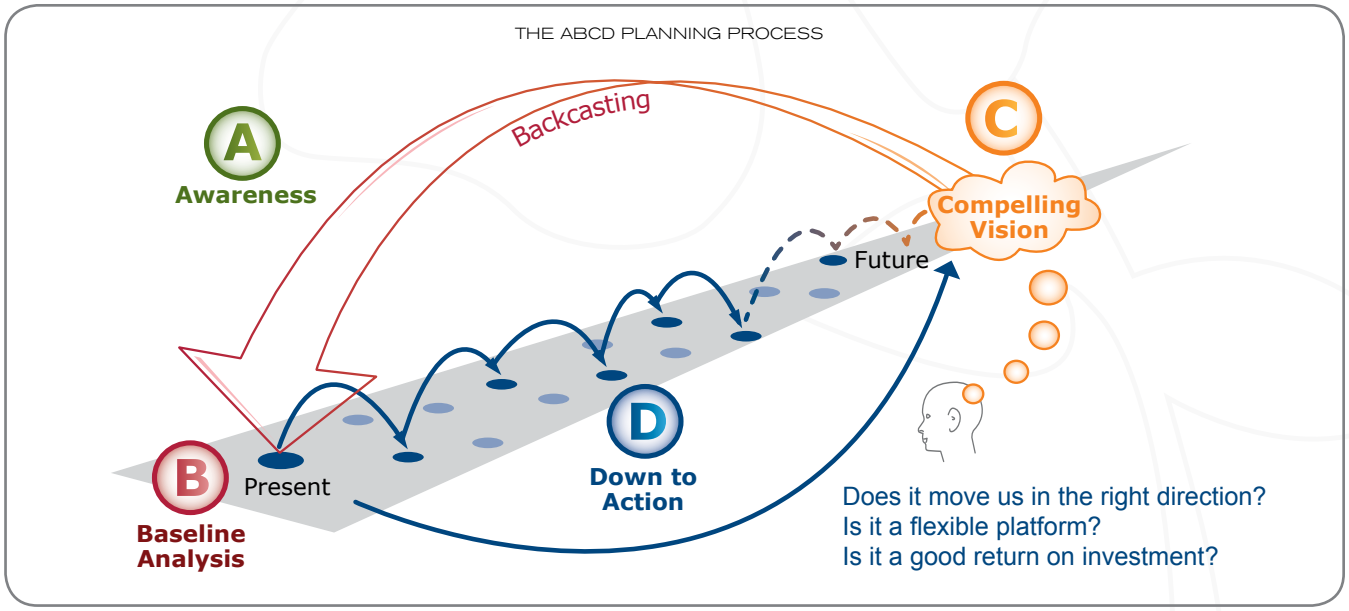
2. Does the action or investment provide a stepping-stone to future actions or investments? No single investment will get you to sustainability, just like no single play will win a hockey game. Knowing this, you need to prioritize your investments to give you the greatest degree of flexibility for future moves, and you want to avoid tying up capital in moves or technologies that are dead ends or that are so costly that they make it difficult to invest in improvements later.

3. Does this action provide an adequate return on investment?* It doesn't do anyone any good if an organization that is trying to become sustainable goes bankrupt. You need to maintain economic sustainability as you travel toward ecological and social sustainability. As a rule of thumb, it makes sense to start by investing in the 'lowest hanging fruit'. These are actions that generate a good return on investment and can be used to fund more complicated and expensive actions later on. Often, the low hanging fruits are improvements in efficiency that generate immediate savings.

There are many different ways to become sustainable, and every organization needs to choose its own path and identify the resources it will need to succeed.

Many excellent tools, concepts and metrics are available to help you understand sustainability, identify actions and evaluate your impact. If one of your strategic goals is to develop greener buildings, you might use the LEED tool to help evaluate your progress. If you are rewriting municipal by-laws, you might use Smart Growth principles to help develop land-use policies. Or if you are

* Return on investment (ROI) is traditionally seen as a return on financial investment, but it can also mean a return on political, social or other types of investment.



developing a new factory you might look at integrating cradle-to-cradle thinking into your design processes or adopting ISO 14001 as your environmental management system.

The number of tools and approaches to sustainability is growing rapidly – the key is to find the tools that meet your particular needs, priorities and capacity. Screening potential actions by answering the three strategic questions will help you prioritize your ideas for short-, medium-, and long-term implementation.

Moving toward sustainability is not a linear process, so it is important to evaluate your progress regularly and make mid-course corrections along the way. Ultimately, your sustainability action plan should be integrated with your organization's general business plan, budget and management systems. This will ensure progress toward sustainability is evaluated regularly and continues to improve. As each action unfolds, it's also important to celebrate and share successes, internally and throughout your community. This will help make the story of your journey toward sustainability inclusive, accessible and exciting.

SUCCESS STORY

The Town of **Olds, Alberta** used the Alberta Urban Municipalities Association's (AUMA) Municipal Sustainability Planning Guidebook and The Natural Step System Conditions to create a plan for reaching their vision of success. In a series of community engagement sessions, 15 strategy areas were reviewed by elected officials, town staff, and citizens of Olds. The participants were asked to analyze the current reality of each strategy area, define success, and suggest opportunities to bridge the gap between the current reality and their vision of success. The resulting plan will be reviewed and refined each year to ensure that it continues to move the community in the direction its citizens want to go.

For more on the Town of Olds, visit http://www.thenaturalstep.org/en/town-olds-alberta.

See the AUMA guidebook: http://www.thenaturalstep.org/en/alberta-urban-muncipalities-association-planning-guidebook.

EXAMPLES OF TOOLS AND CONCEPTS

Examples of tools and concepts for sustainability:

- Environmental management systems such as ISO 14001
- Measurement tools such as Genuine Progress Indicators, Happy Planet Index and the Ecological Footprint
- Design approaches and tools such as Smart Growth, Cradle-to-Cradle, Factor 10, Life Cycle Assessment and LEED (Leadership in Energy and Environmental Design).
- Development approaches such as Natural Capitalism, Sustainable Community Development and the United Nations' Agenda 21
- Innovation movements such as Zero Waste, Climate Neutrality and the United Nations Millennium Development Goals

For more information on these tools and concepts – and many others – visit the resources page for this primer at www.thenaturalstep.org/en/canada/primer-resources.

Photo: Olds Strategic Sustainability Plan, 2007

Youth from the Town of Olds, Alberta, shared their visions for the town's future as part of Olds' sustainability planning process.

Bringing It All Together

"The question of reaching sustainability is not about if we will have enough energy, enough food, or other tangible resources . . . The question is: will there be enough leaders in time?"

–Dr. Karl-Henrik Robèrt, founder of The Natural Step

So far, this primer has defined what sustainability is, outlined the root causes of unsustainability, and described a set of principles and an 'ABCD' process for planning and decision making. Taken together, these provide a framework for strategic sustainability planning.

We start by acknowledging that we are working in a **system** (the planet earth), where the 'rules of the game' are the cycles that maintain our environment in a state which supports a healthy human society. If we want to be **successful** in this system, which we define as being able to prosper on the planet both now and in the future, we need to use the four system conditions for sustainability to guide us. Our main **strategy** for achieving success is backcasting from sustainability principles. This allows us to identify the gap between where we are now and where we want to be in the future. It also ensures that we choose specific strategies and **actions** that will lead us to success. We then select among the many different **tools**, concepts and metrics that can help us understand where we are and support us on our journey toward sustainability.

Next Steps

There are endless possibilities for specific actions to help you move toward sustainability. The options will vary according to your budget, organizational culture and priorities. Some ideas for early action include:

- **Build awareness and understanding** - Hold sustainability education workshops for staff and stakeholders so that you are all on the same page and headed in the same direction;
- **Collaborate** - Create strategic partnerships to support your efforts to become more sustainable. These may include internal partners (such as suppliers, service providers, clients, or customers) as well as external organizations that share your interest in sustainability;

THE 5-LEVEL FRAMEWORK

The five-level framework pictured here was developed by The Natural Step to help groups take steps toward success in many situations. This can be illustrated using the example of a hockey game.

At the systems level, you have to understand the rules of the game in order to play. At the success level, your team has a shared understanding of success: scoring more goals that the other team (and having fun!). You can use many different strategies to win, including building up a strong defense or passing in a certain formation. You then take concrete actions to achieve success – hopefully by scoring a goal. Some of the tools you might use include training programs to get you in shape, coaching advice to build your skills, or a high-tech pair of skates to improve your speed.

Photo by dziner - Flickr.com

- **Create a plan** - Create a sustainability team within your organization and work together to create your plan and solicit ideas and input from the rest of the organization;

- **Research** - Conduct an energy audit or a baseline assessment of your resource use to see how greater efficiencies can be achieved or research sustainable product design and material recycling in a closed-loop approach;

- **Become more efficient** - Change your light bulbs, reduce paper use, reduce waste, and implement energy-saving measures. Reduce transportation-related CO_2 emissions by initiating a walk- or bike-to-work program. If you're not already doing them, these are the easy things to start with, and they usually result in early cost savings;

- **Upgrade your infrastructure** - Install new infrastructure or technology, such as a high-efficiency furnace or a renewable energy system using solar, wind or geothermal energy; and

- **Get involved** - Adopt a local charity or volunteer staff time to give back to your community.

The two most important actions we all need to take are to:

- **Become a sustainability champion** – Any individual or organization can become a champion. All it takes is passion, commitment, and a systematic approach to change. You can start by applying the planning process described in this primer and following author Bob Willard's seven practices of sustainability champions (below);

- **Advocate for change** – The reality is that we won't become sustainable without making big changes. And those big changes aren't going to happen unless people stand up and demand them. Find the issue you are most passionate about and get organized. Write letters, make phone calls, run for political office, start a new business, take a risk. Unleash the sustainability champion within you!

SUCCESS STORY

As part of its municipal sustainability planning process, the **City of Airdrie, Alberta** created a community-wide engagement process to develop a shared vision of the future that all community members can work toward. When the Canadian Broadcasting Corporation's *The Hour* launched One Million Acts of Green, an initiative encouraging Canadians to complete as many sustainable actions as possible, Airdrie's citizens jumped at the chance. By the end of the project, 739 people had registered online for the project, adding more than 33,000 'acts of green' which, if implemented, will prevent a total of almost 3,350,000 kg of greenhouse gases from being released into the environment.

Airdrie's shared vision of success in a sustainable society helped the community rally together to create change that will move it toward its desired goal. In the meantime, the community is also developing its own strategic sustainability plan to guide municipal-level decision making and actions.

For more, visit http://www.thenaturalstep.org/en/city-airdrie-alberta.

SUSTAINABILITY CHAMPIONS

Seven Practices of Sustainability Champions:

1. Get Credible, Stay Credible
2. Dialogue
3. Collaborate, Educate, Network
4. Meet Them Where They Are
5. Piggyback Existing Initiatives
6. Influence the Influencers
7. Practice 'Planful Opportunism'

This list is taken from author Bob Willard's 2009 book, *The Sustainability Champion's Guidebook*. For more information, visit www.sustainabilityadvantage.com.

Photo by Eric Ezechieli

Last Words

Creating the future we want does not simply mean doing things a little bit better than we did yesterday – using a little less energy, a little less paper, or creating a little less waste. That's incremental change, and while it is a very important first step, it's not enough. Incremental change means we slow down while we continue to go in the wrong direction. David Suzuki has used the metaphor of a speeding car to describe our current direction: "We're in a giant car heading toward a brick wall, and everyone is arguing over where they're going to sit." If we slow down, we buy ourselves some extra time, but we'll still hit the wall. We need to choose a new destination and turn the car around. We need to change the way we run our businesses, design our cities, and interact with the natural environment. That's transformational change.

The sustainability principles described in this primer shift our focus away from symptoms toward the underlying causes of problems. By taking action at the source, complexity becomes more manageable, and **we are better able to prevent damage before it occurs**.

This is a journey that is going to take unprecedented leadership. We are not going to get the future we want if we sit back and wait for someone else to start first. What the world needs now, more than ever before, is leadership. Role models. Champions. People who are willing to stand up and make a difference.

And leaders aren't just CEOs and politicians. Leaders can be champions at any level of an organization or community. They can be summer interns, departmental managers, janitors, teachers, technicians, engineers, stay-at-home moms, and students. Effective sustainability champions have a special combination of passion and competence. They care deeply enough to make change happen, even if the obstacles seem great. And they are skilled enough and committed enough to identify those obstacles and remove them one by one.

Sustainability is about nothing less than deciding the future of our world. We all share the privilege and responsibility of making choices in our lives. It is up to each of us to create a future we can be proud of passing onto future generations.

More Resources

This primer has provided an overview of a strategic approach to sustainability planning and decision making. The Natural Step has assembled an online list of additional links, toolkits, case studies and other resources for deepening your understanding and taking action to make sustainability a reality. For more information visit the online resource page for this primer at www.thenaturalstep.org/en/canada/primer-resources.

The Natural Step also offers affordable online courses in sustainable development. These interactive, award-winning courses have been used by individuals, businesses, not-for-profits and communities across Canada and around the world to catalyze action toward sustainability. To learn more or to purchase a course, contact elearning@naturalstep.ca or visit the eLearning website at www.thenaturalstep.org/elearning.

Photo by DrGrounds - iStock.com

About The Natural Step

The Natural Step Canada is a national non-profit organization that provides training, coaching and advice on how to advance the practice of sustainable development. Our mission is to connect every leader in Canada with the inspiration and education they need to integrate economic, environmental and social priorities into their planning and decision making.

We offer a clear, compelling, science-based understanding of sustainability and a practical strategic planning framework to help organizations make the choices that will move them toward sustainability.

Our role is to act as coaches to help our partners build the leadership, commitment, and capacity they need to transform their organizations. We help create alignment among teams, departments and stakeholders through the development of a common language and a shared vision of success for sustainability. We also act as a hub for a growing network of sustainability leaders and champions who are sharing and learning from each other.

Founded in 1989 in Sweden by Dr. Karl-Henrik Robèrt, The Natural Step now has offices in 11 countries, including Canada. The Natural Step Framework for Strategic Sustainable Development is being used internationally by hundreds of organizations, including Fortune 500 companies, government departments, universities, municipalities and small- and medium-sized businesses in their respective journeys to sustainability.

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