



Graphic design Link Ontwerpers

# Sustainable innovation

Exploring a new innovation paradigm  
by Dorothea Seebode

**PHILIPS**

# About the author

Dorothea Seebode was appointed Senior Director Sustainability at Philips Research in April 2006. In close cooperation with the Philips Corporate Sustainability Office she has worked globally on embedding sustainability as a business and innovation driver.

She represented Philips in the World Business Council for Sustainable Development Vision 2050 project where she led the work stream on *human well-being*.

Previously, Dr Seebode spent several years at Philips Lighting in traditional innovation roles. She was also involved in co-shaping a new vision for Philips Lighting and pioneering new ways of working in new business creation and strategic marketing.

Dr Seebode holds a PhD in Physics from the Technical University in Aachen (RWTH Aachen), Germany. She has been a LEAD Fellow since 2007 and is a member of the steering board of the Green Economy Coalition.

# Contents

About the author	
Contents	
Foreword	2
About this book	3
Our human dilemma	6
<b>Part I: The vital need for sustainable innovation</b>	<b>9</b>
Sustainability in the round	10
Change starts with you and me	12
The growth delusion	14
Re-connecting to life	16
Nature's inspiring systems	18
<b>Part II: Understanding sustainable innovation</b>	<b>21</b>
This innovation opportunity	22
Powerful momentum	24
A chasm to cross	26
Re-framing innovation	28
Social innovation	30
Collaboration	32
<b>Part III: Sustainability and Innovation @ Philips</b>	<b>35</b>
Where Philips comes from	36
Where the company is now	38
Where it might go	40
<b>Part IV: Strategies to drive sustainable innovation</b>	<b>43</b>
Ingredients of high impact sustainable innovation	44
Build relationships towards a higher purpose	46
Enable sustainable lifestyles	50
Create multi-stakeholder value	54
Use resources responsibly	58
Final Thought	62
Acknowledgments	64
Endnotes	66

# Foreword

## Sustainability driving innovation

Philips can build on a long legacy of sustainability leadership. In recent decades, we have participated in numerous public debates from the Club of Rome's Limits to Growth to healthcare round tables in emerging economies. We are a member of several sustainability networks such as the World Business Council for Sustainable Development (WBCSD) and the Global Compact. And Philips has repeatedly achieved leading scores in the Dow Jones Sustainability Index.

Philips also has an impressive track record in innovation. Over the years, we have re-invented our innovation approaches, anticipating changes in society and our markets. Current mega trends suggest that humanity is witnessing the emergence of the next big innovation wave, driven by societal and environmental needs. Technology will be an important enabler. But the problems confronting the global community are complex "system challenges", which increasingly require solutions co-created with multiple stakeholders.

Addressing these trends is fully in line with Philips' ambition to become the leading company in health and well-being and to improve people's lives with meaningful, sustainable innovations, as set out in our Vision 2015 and EcoVision5.

Building on our company vision and inspired also by the WBCSD Vision 2050 (in which Philips participated), this paper offers a tool to link Philips' innovation and sustainability agendas. The first two parts provide an overview of the changing business and innovation context, while last two parts give an insight into the specifics of sustainable innovation at Philips.

The world is facing complex challenges. Nobody can solve them alone. However, they also present a huge opportunity, so let's accelerate innovation with our partners!

Henk de Bruin  
Global Head of Sustainability

Henk van Houten  
General Manager Philips Research

# About this book

*Knowing is not enough; we must apply. Willing is not enough; we must do – Johann Wolfgang von Goethe*

## Vision 2050: a call for sustainable innovation

In 2010, the World Business Council for Sustainable Development (WBCSD), of which Philips is a member, published its Vision 2050 – a vision of a world where in 2050, *some nine billion people live well, and within the limits of the planet.*

The Vision 2050 report looks back from this desired future<sup>1</sup> to explore pathways that might lead to it. These pathways require fundamental changes in people's values, human development, economy and business.

## First steps towards action

This paper is a first step to bridge the gap between the broad long-term vision and concrete action. In doing so, it calls on innovators to take a lead, personally and in their business, in driving radical change.

**Part I** sets out why future innovation<sup>II</sup> should be **sustainable innovation**<sup>III</sup>. It explains how individual innovators can start making a difference in their personal and professional lives.

**Part II** looks at the enormous opportunity offered by sustainable innovation; some of the challenges it presents, and why for those ready and willing to shape a sustainable future, the time to start is now.

**Part III** introduces the Philips context in terms of innovation and sustainability by briefly sketching Philips' legacy in these fields, where it is now and where it might go

**Part IV** sets out four key strategies that can be used today. It recognizes that sustainable innovation is complex, but highlights proven methods, tools and ways of working already available for innovators to re-use for new applications. The strategies are illustrated with examples from Philips.

## A platform for dialog and inspiration

This book is the result of a collaborative effort. It does not claim to be comprehensive; rather it offers a platform for dialog and a source of inspiration. By consolidating explorations, social innovation experiments and learning that took place in Philips Research and the Philips Corporate Sustainability Office between mid-2006 and mid-2010, it seeks to build confidence that sustainable innovation is both desirable and possible.

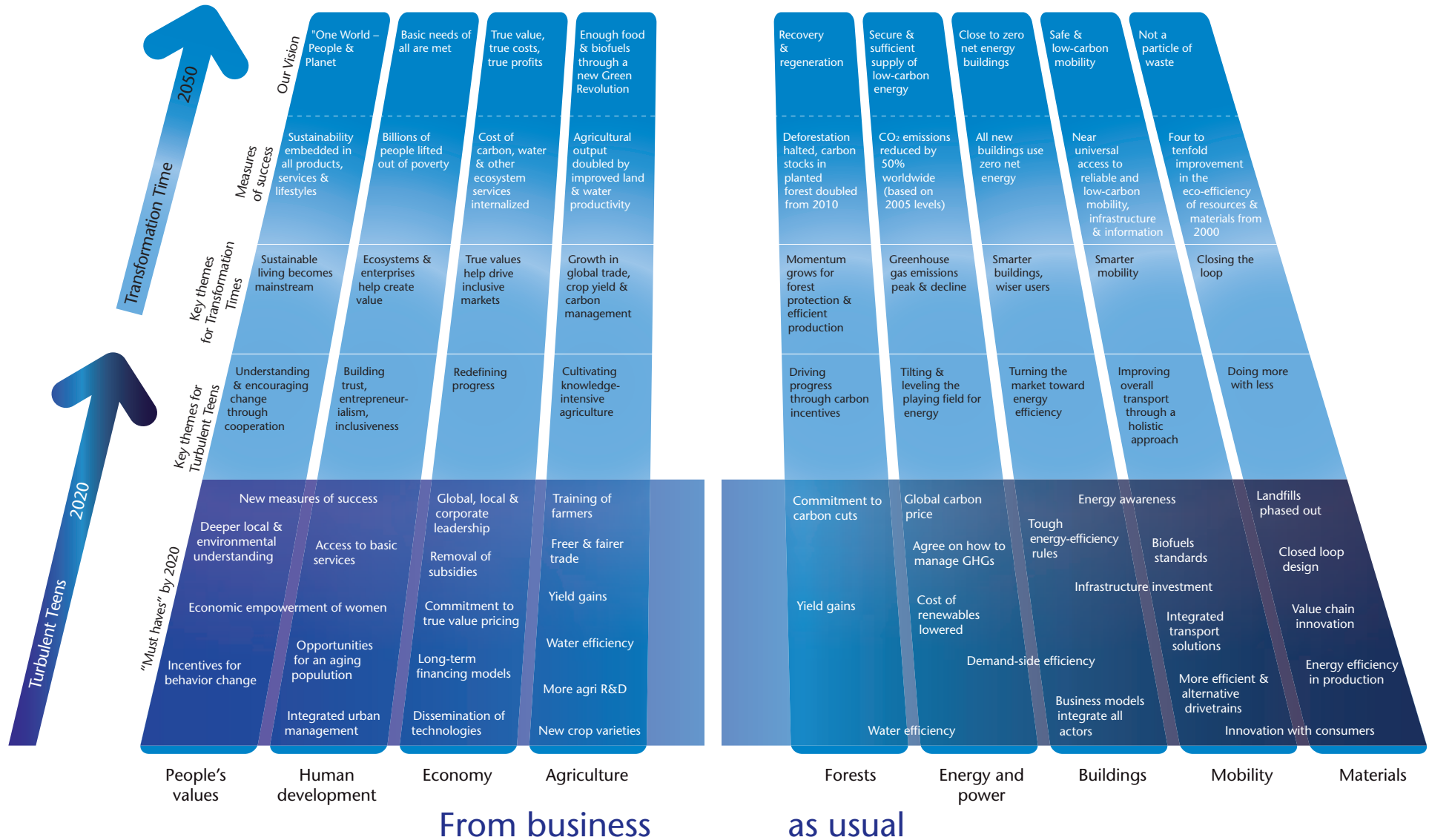
# The WBCSD Vision 2050

Pathways to Vision 2050

Source: WBCSD: Vision 2050, The new agenda for business, 2010, Full Report, page 13

## To a sustainable

## world in 2050



# Our human dilemma

In 1987 Earth Overshoot Day was on 19 December. In 2010, it was on 21 August.

## We're living beyond our social and ecological means

The context behind this book's call for sustainable innovation is simple, but critical. We – humanity – have a problem, as Earth Overshoot Day<sup>IV</sup> makes painfully clear. This is the day by which we've used more of the earth's "ecological services" for that year than nature can provide. And every year it arrives earlier. Twenty years ago, it took till December to outpace the planet's capacity to keep up. In 2010, we got there in less than eight months.

Yet, at the same time, millions of people live without the most basic requirements for subsistence.<sup>V</sup> So while many enjoy the abundance and well-being provided by humanity's remarkable ingenuity, many others are excluded.

Should we abandon hope? Give up trying to make the world a better place? Absolutely not! Within the challenge lies enormous opportunity.

In their contribution to the Vision 2050 project, PricewaterhouseCoopers prepared an illustrative analysis of some of the

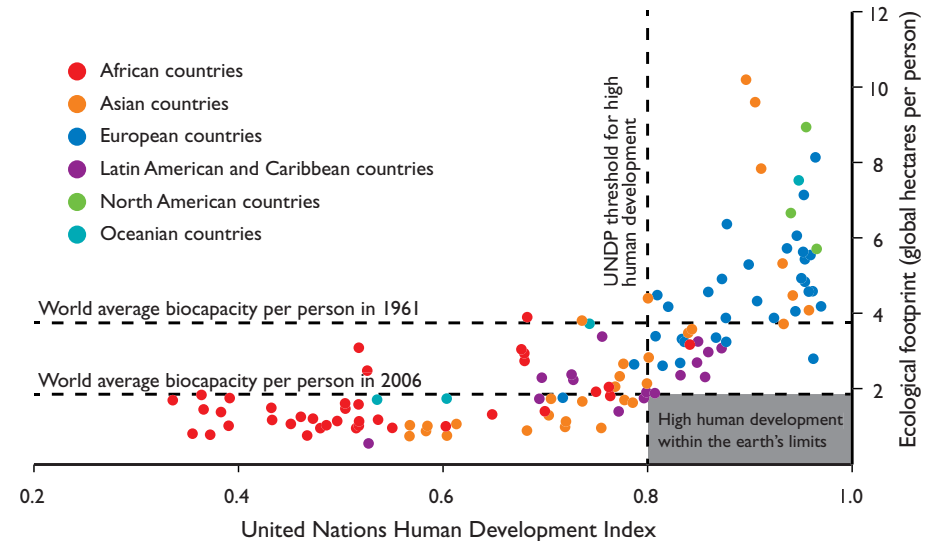
global business opportunities arising from pursuit of the 2050 vision. They suggest that additional sustainability-related business opportunities could be of the order of 3% of projected world GDP.<sup>VI</sup> In short, the 29 firms behind Vision 2050 recognize that creating long-term business value and contributing to a sustainable future are mutually reinforcing.

However, overcoming today's locked-in short-term market dynamics will take courage and energy. As envisaged in Vision 2050, radical change is required. Governments have a role to play in shaping the innovation environment through legal frameworks. And corporate innovation efforts can shape consumer demand and deliver new solutions.

Nor can it be "innovation as usual". It must be sustainable innovation, shaped as much by environmental, social and economic measures, as enabled by technology. The time is ripe to ask ourselves fundamental questions, individually and collectively – about what progress, development, and human well-being really mean. And what are we prepared to do – and in which role – to achieve them.

No individual, business, or government can do it alone. Everybody must contribute. To borrow a phrase from environmentalist and entrepreneur, Paul Hawken "you're brilliant and the planet's hiring."<sup>VII</sup>

## Humanity's unsustainable development



Source: © Global Footprint Network (2009).  
Data from Global Footprint Network National Footprint Accounts, 2009 Edition; UNDP Human Development Report, 2009



## Part I

### The vital need for sustainable innovation

Why it's time for us to re-connect with the planet and each other  
and to embrace complexity

# Sustainability in the round

*In the past sustainability has engaged the mind, but the future demands an engagement with the heart as well – W.M. Adams*

What if you look at the whole picture?

In the coming pages, we invite you to think further about our human dilemma and how sustainable innovation can provide solutions and new opportunities.

Frequently, sustainability has been seen as a compromise between the three domains of “society”, “environment” and “economy”, or “People-Planet-Profit”. And the relationship between the three has been represented by overlapping circles (see right). This representation has proven useful, but it is flawed. It assumes that the domains are separate, even autonomous, ignoring the fundamental connections between them.

Such a view could lead to the assumption that there can be trade-offs. At the most extreme, such models suggest that financial (economic) capital can replace or substitute for natural resources. That is, if we have financial wealth, it doesn't matter if we use up our planet's environment and naturally occurring materials.

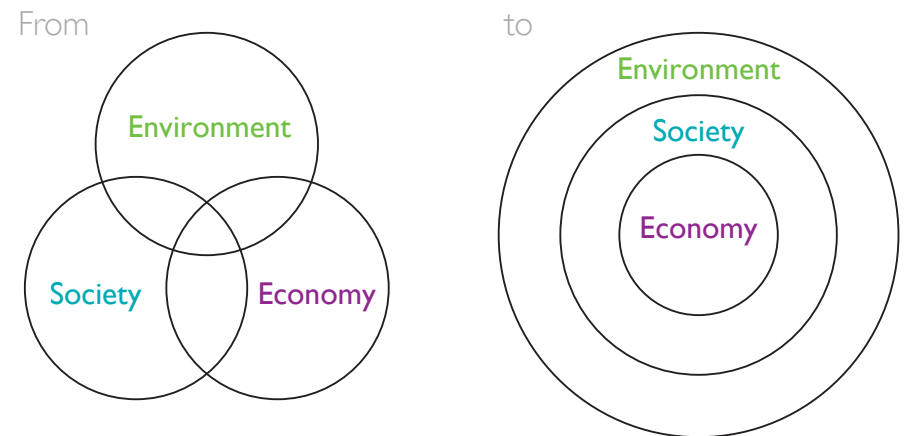
So they divert us from the real questions that lead to sustainable development such as: What is the true nature of human society? How can business enable human well-being? How are decisions made and in whose interest and benefit?

Thinkers in this field suggest an alternative nested model that more accurately portrays the interdependencies between economy, society and environment. See the diagram opposite based on work by B. Giddings et al. The economy depends on society and the environment (although for many people, society did and still does exist without a formal economy). And nature will continue to exist without humanity and human activity.

This holistic view breaks down barriers between sectors and disciplines. It allows for diverse, currently unaligned and even competing players to work together. This interconnectedness is the key to sustainable development. And it's why this book embraces and extends the nested model, adding the individual in the center, to create a “4 P” approach.

- Person → **Change starts with you and me:** individual people taking personal responsibility in their private, professional and public lives
- Profit → **The growth delusion:** questioning current economics-driven measures of progress and inviting thought about prosperity beyond financials
- People → **Re-connecting to life:** understanding people's dependence on each other and the environment that supports our lives
- Planet → **Nature's inspiring systems:** acknowledging that nature can serve as an inspiration and help humanity innovate towards lifestyles without waste.

Beyond overlapping circles to the nested model



Source: B. Giddings, B. Hopwood, G. O'Brien, Environment, Economy and Society: fitting them together in Sustainable development, Wiley Interscience, 2002

# Change starts with you and me

Humanity has largely had an exploitative relationship with our planet; we can, and should aim to make this a symbiotic one – Michael Mack, CEO, Syngenta<sup>viii</sup>

## What if we dared to work towards a shared higher purpose?

The UN's Millennium Ecosystem Assessment (MA), the Green Economy Coalition, the Global Footprint Network – numerous organizations and reports tell the same story. Lifestyles in the developed world require more than the equivalent of 2 planets per year. If developing and emerging countries follow the same pattern, humanity as a whole will need the equivalent of 2.5 planets by 2050.<sup>ix</sup>

The problem can seem so huge and complex that you feel powerless to act. Businesses struggle with conflicting goals: short-term profit maximization versus long-term prosperity. Governments recognize global challenges, but are driven by local interests and national objectives. Even when change is clearly needed, such as on greenhouse gas emissions, it's often a question of leadership: who will take the first step?<sup>x</sup>

And where do you personally start to make a difference or take your actions further? At the heart of all action are personal values, so a good place to begin is to

reflect on your own belief systems. Take a step back and observe what's going on. Consciously distinguish between facts and assumptions, and test your assumptions against reality.

Change experts like Stephen Covey,<sup>xi</sup> Peter Senge,<sup>xii</sup> Chris Argyris<sup>xiii</sup> or Seth Godin<sup>xiv</sup> provide models of how individuals can drive change – personal and organizational. Most importantly, find others who share the commitment to the higher purpose of sustainable innovation.

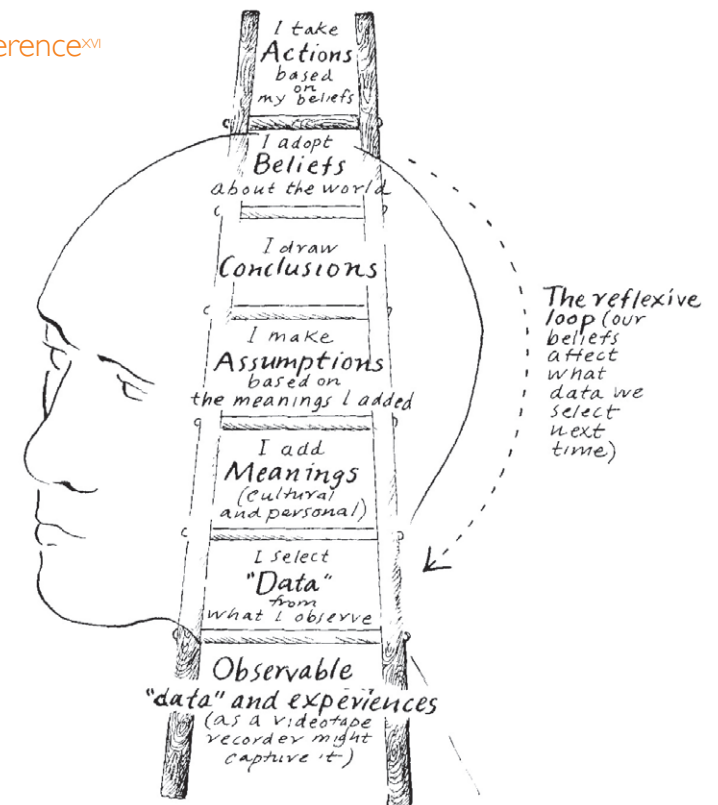
When people apply collective creativity, knowledge and energy, great things happen. From mass sanitation to medical imaging, from crop rotation to the “green revolution”, collective human endeavors have enabled great leaps in well-being.

The scale and urgency of our problem demands bold visions and radical action. Economist Manfred Max-Neef pointed out that humans have a few basic needs, but an unlimited number of “wants”.<sup>xv</sup> Is fulfilling endless wants a key to well-being? Or can we define a sustainable view of a “prosperous life”?

Change starts with each of us daring to question the purpose of our lives and of society. In business and innovation, what value do we want to create? What do we mean by success? And how will sustain-

able development happen in emerging and developing countries, where economic growth is required to serve people's needs? Which sustainable innovation enables leapfrogging?

## Ladder of inference<sup>xvi</sup>



Source: <http://www.postkiwi.com/2005/african-bible-study/>



# The growth delusion

Gross national product measures ... everything, in short, except that which makes life worthwhile –  
 Senator Robert Kennedy<sup>xvii</sup>

## What if happiness were more important than material wealth?

In the last 50 years, innovation success or societal progress has become almost uniquely associated with economic growth. Governments talk in terms of gross domestic product (GDP); businesses in terms of profit and shareholder value.

These measures capture production, commercial transactions and financial results. If you crash your car and it needs to be repaired, the payment you make to the mechanic increases GDP. Is that success? Most economic indicators don't factor in environmental and social costs. Nor do they tell us whether ever more economic growth or material wealth makes us happy.

Obviously, economic development is key to fulfilling people's basic needs and enabling well-being. And in many parts of the world, such development is still essential. However, numerous studies show that beyond a certain threshold more "stuff" does not increase people's happiness.<sup>xviii</sup>

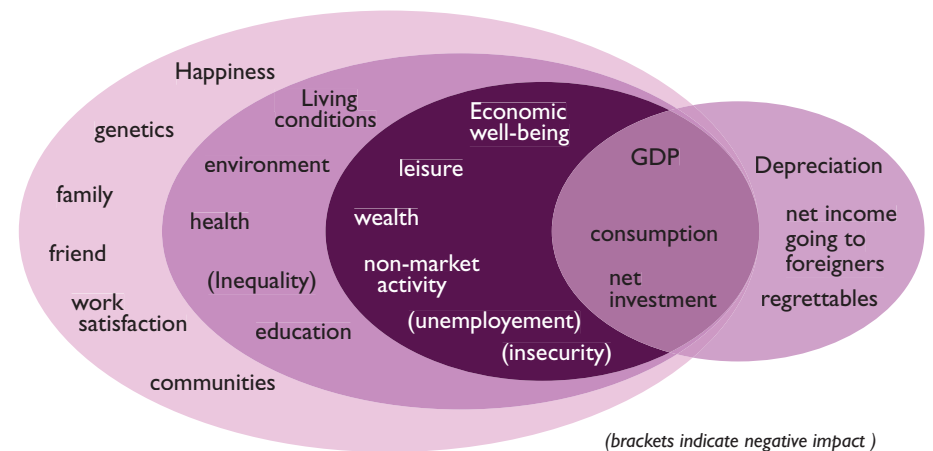
In fact, while the WWF's Living Planet Report 2010 paints a stark picture of human over-consumption, it also shows that "...a high level of consumption is not necessarily required for a high level of development or well-being".<sup>xix</sup>

In the words of an expert commission established by President Sarkozy of France: "...the time is ripe for our measurement system to shift emphasis from measuring economic production to measuring people's well-being. And measures of well-being should be put in a context of sustainability."<sup>xx</sup>

Indeed, many economists and thinkers like Professor Michael Porter of the Harvard Business School believe the time has come to re-think capitalism.<sup>xxi</sup> Can developed economies create "prosperity without growth" as Professor Tim Jackson argues in his highly influential book of that name?<sup>xxii</sup> Environmental and ecological economists suggest that economic levers like internalizing environmental costs, cap and trade, and government regulation can help create an economic system that sustains life on our planet, rather than fatally exploiting it.<sup>xxiii</sup>

Looking from these new perspectives of well-being and a "steady state" economy, what new business objectives arise? And what kind of sustainable innovation will fulfill them?

## What GDP does and does not measure



Source: Deutsche Bank Research, Measures of Wellbeing, 2006

# Re-connecting to life

*We are all caught in an inescapable network of mutuality, tied to a single garment of destiny. Whatever affects one directly affects all indirectly – Martin Luther King Jr.*

## What if we understood both the community and space we live in?

So far we've seen that the perilous state of the planet's resources demands sustainable innovation. And that measuring well-being instead of growth gives society both a way to drive this new kind of innovation and to assess its success. Once you have embarked on the journey to sustainable innovation, the third step is the willingness to understand the system we live in and embrace its complexity.

How we live, how we satisfy our needs and wants, and our impact on natural resources are inextricably interconnected. People have always known this. It's embedded in cultures like those of the native peoples of North America. "Trees, air, water, animals, grass, Earth are like many strands that weave the web of life; men are merely a strand of it. Respect your Mother [Earth] because what befalls the Earth soon befalls the sons of the Earth."<sup>XXIV</sup>

Yet today, this often seems like a (re)discovery. In recent centuries, secularization,

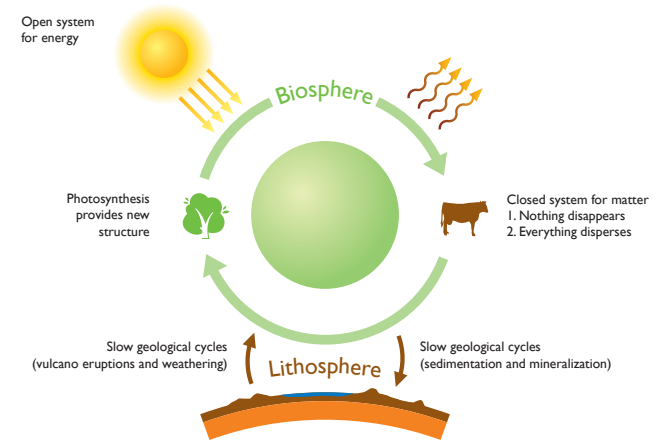
the growth of scientific knowledge and its application in technological and economic development have tended to reinforce notions that humanity can dominate and control nature – the planet is ours to exploit.

Industrialization, consumerism and urbanization have diminished people's sense of the connection between their individual lives, their dependence on community and Earth's ability to support us. Humanity shapes the world, often with little sense of being part of it.

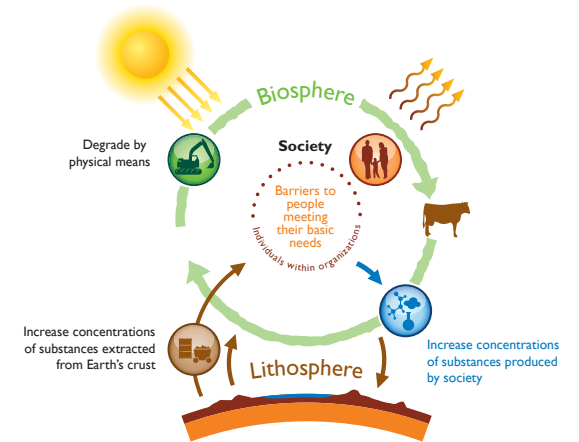
Ecological and social catastrophes like the explosions in Bhopal and Chernobyl, the recent oil leak in the Gulf of Mexico, mass-shootings in schools, or the sub-prime mortgage crisis appear as isolated events. Increasingly, however it's clear that they are inter-connected "system errors" in our societies.

Looking at these interconnections – and developing new ways of collaboration so that all stakeholders connect and communicate – will be crucial for tackling such system errors. And in this, what role will new technologies like social media play?

## Natural cycles



## The impact of unsustainable human society



Source: *The Natural Step: Sustainability Primer*, pages 6 and 8  
Downloadable at <http://www.thenaturalstep.org/en/Canada/download-form>

# Nature's inspiring systems

*In the midst of all this chatter about the leaves, very few of us have been paying attention to the environment's trunk and branches – Karl-Henrik Robèrt, The Natural Step<sup>xxv</sup>*

## What if we took a bird's eye perspective?

How does this renewed awareness of our interdependence on each other and all life on the planet affect our own lives? What does it mean for innovation? How can you manage complexity? Increasingly, innovators are discovering that the natural world itself provides both inspiration and solutions.<sup>xxvi</sup>

The industrialized world of mass manufacturing is mechanistic and linear – raw materials in, products out, to be used and ultimately discarded. It's a world where people are defined as “consumers”, seemingly de-coupled from the natural environment on which they depend.<sup>xxvii</sup>

In contrast, natural eco-systems offer inspiring examples of well functioning inter-connectedness. Here, adaptive systems and closed loops abound. Even the largest trees or the biggest mammals depend on habitats and food sources where everything has its role, right down to the smallest bacteria that breakdown waste and recycle nutrients into the cycle of life. There is no waste in natural eco-systems.

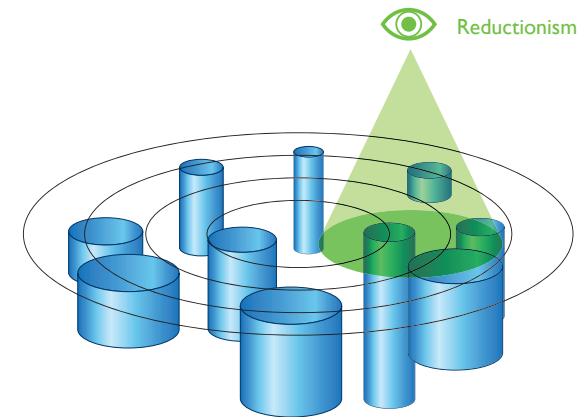
In this world view, human beings are part of living systems. And by taking the natural world as inspiration, we can start thinking at the level of function and meaning, rather than components and fragments. Embracing “systems thinking” will help all the stakeholders involved to understand the interrelations and multiple causalities within a complex adaptive system.<sup>xxviii</sup>

Indeed, many business leaders increasingly believe that the societal problems facing the planet are too large and too complex for any sector or organization to address alone.<sup>xxix</sup>

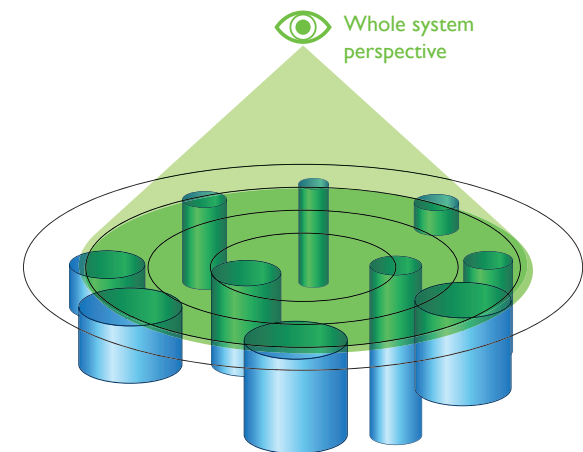
For instance, in Germany, energy company RWE is working with car manufacturer Daimler to pilot electric cars in Berlin.<sup>xxx</sup> In Mexico, Eneco Energy Trade, Royal Philips Electronics and ING Wholesale Banking are working with the government on Luz Verde, a project to distribute 30 million energy-saving CFL light bulbs to low and middle income households.<sup>xxxi</sup>

Looking at these system solution examples, how will sustainable innovation flourish? Can it be speeded and scaled up?

From



to



Source: both diagrams The Natural Step, Level 2 Training, The Netherlands, 2010



## Part II

### Understanding sustainable innovation

Creating new kinds of value for a *healthy me* in a *healthy society* on a *healthy planet*



# Powerful momentum

*We must use time wisely and forever realize the time is always ripe to do right – Nelson Mandela*

## Why now?

According to the renowned management thinker and “social ecologist”, Peter Drucker, every few hundred years in western history a sharp transformation occurs. “Within a few short decades, society rearranges itself; its worldview (paradigm), its basic values, its social and political structures, its arts, its key institutions. Fifty years later there is a new world.”<sup>xxxiii</sup>

There is much evidence to suggest that humanity is nearing such a tipping point today. In other words, sustainable innovation is not only an opportunity, it’s an opportunity driven by a fundamental social shift and a desire for new values that go beyond individualism and consumerism.

When Rachel Carson published *Silent Spring* in 1962, questioning the impact of a technological advance (the insecticide DDT) was seen as deeply subversive. Since then, issues like the ozone hole, loss of biodiversity, greenhouse gas emissions, climate change and the nuclear power plant crisis in Fukushima have radically altered attitudes. Environmental considerations have come to the forefront of global

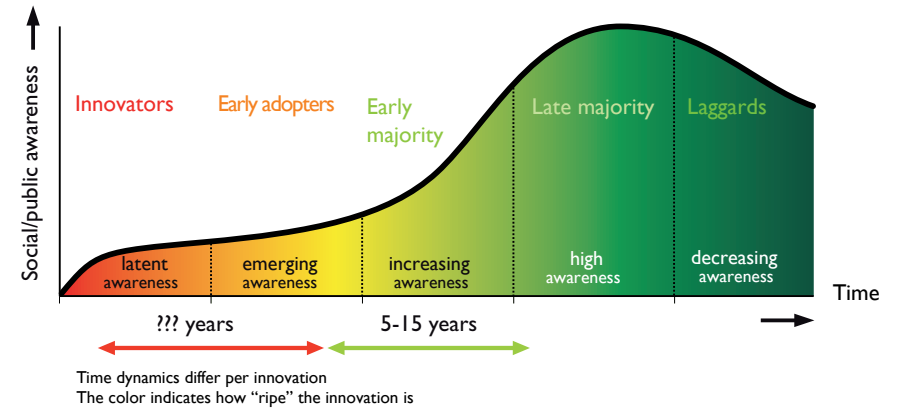
political debate. And in 1992, with the launch of Agenda 21<sup>xxxiv</sup> at the first Rio Conference, the global community recognized that sustainable development has social and economic as well as environmental dimensions.

Today, a vast array of different stakeholders recognizes the need for action: governments,<sup>xxxv</sup> businesses,<sup>xxxvi</sup> academics, NGOs,<sup>xxxvii</sup> social and human rights organizations,<sup>xxxviii</sup> environmental groups, citizen-led movements<sup>xxxix</sup> and millions of individuals. Sustainable innovation has powerful momentum – it’s becoming mainstream, moving from emerging awareness to increasing awareness on the innovation maturity curve (see facing page).

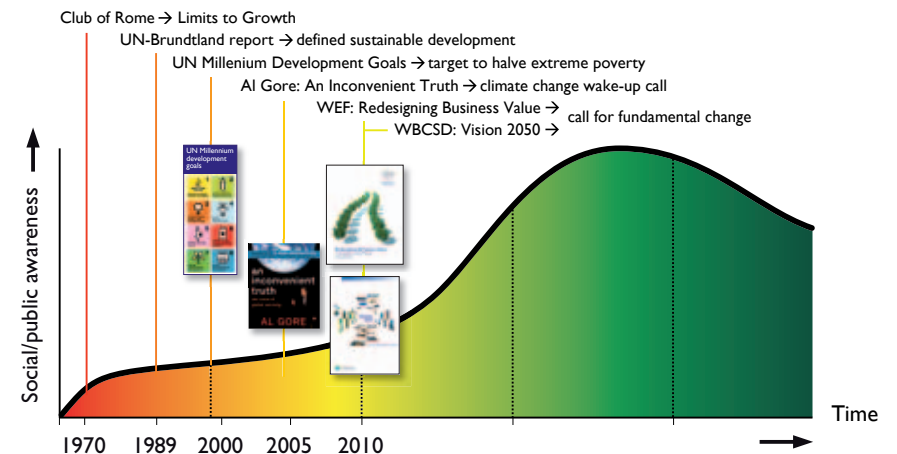
The environmental imperative is clear. And as we’ve seen earlier, the shift to sustainable innovation is underpinned by growing questioning of the existing social and economic order, particularly in the developed world.

This will not be short-term, incremental innovation, but deeper structural change and disruptive innovation with a long-term perspective.<sup>xl</sup>

## Maturity of awareness & acceptance of innovations by society/public



## Maturity of sustainability as business & innovation driver



# A chasm to cross

Companies that take the lead on sustainability will be market makers rather than market takers – World Economic Forum, 2009<sup>XLI</sup>

## The vital market leap

Sustainable innovation is clearly an opportunity, but it's also disruptive. It implies fundamental change in economic life, society and how we all behave, as much as in technologies and solutions. Those changes may be highly personal. For instance, if you had a choice of two similar products, what would persuade you to choose the one manufactured with materials from sustainable sources? And if a car sharing scheme started in your neighborhood, would you give up your family car and hire one when you needed it?

For business, the opportunity involves re-thinking roles and objectives. In the words of the World Economic Forum: "It requires a step-change in ambitions for the impact that business and consumption have on the human and natural environment, from "less bad" to "actively good."<sup>XLII</sup>

In this lies another crucial challenge for sustainable innovation – creating the right market conditions and shaping consumer demand. "Cultural creatives"<sup>XLIII</sup> and passionate environmentalists are the early adopters for radical "green" innovations

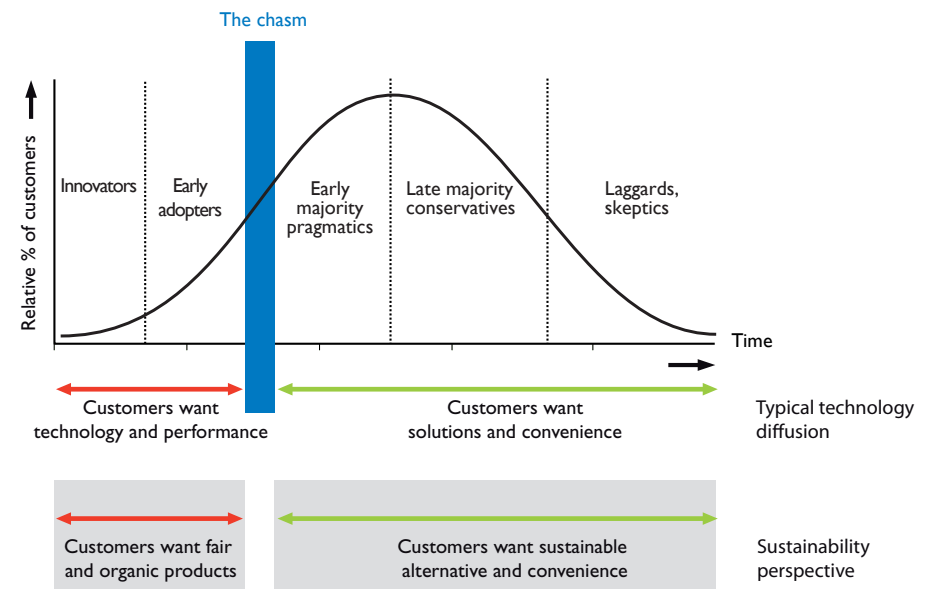
and lifestyles. But what about the rest of the population? Much of how we consume is a question of habit or simply doing what everyone else does.<sup>XLIV</sup>

Companies engaged in sustainable innovation face a challenge similar to that described by Geoffrey Moore, in his widely-acclaimed book *Crossing the Chasm*,<sup>XLV</sup> published in 1991.

Moore pointed out that many high tech ventures fail because they cannot make the step between successfully marketing to the *visionaries* (the early adopters) and the *pragmatists* (the early majority). He showed that for disruptive innovation the smooth bell curve of market adoption has a crack in it. And that marketing to the pragmatists is a completely different task to marketing to the visionaries.

So what does the path to sustainable consumption look like? If you are involved in innovation within a business, what does this mean for you and your company?

## The chasm or 'disruption' zone



Source: Geoffrey A. Moore, *Crossing the Chasm*, 1991

Source: [http://robzicki.files.wordpress.com/2010/02/crossing\\_the\\_chasm1.png](http://robzicki.files.wordpress.com/2010/02/crossing_the_chasm1.png)

# Reframing innovation

*We can't solve problems by using the same kind of thinking we used when we created them –*  
Albert Einstein

## Embracing sustainability principles

The problem of global over-consumption and destruction of natural resources can seem daunting. So how can we turn the interconnected challenges into inspiring innovation opportunities? As an innovator in a company: where do you begin?

The Natural Step's Framework for Strategic Sustainable Development (FSSD)<sup>XLVI</sup> provides a structure and methodology for sustainable innovation. It acknowledges complexity and the limits of technology and of our imagination, and states that a sustainable society can only be defined at the level of "principles".<sup>XLVII</sup> Developed and continuously improved in conjunction with a huge network of business leaders, academics, environmentalists, community workers, teachers and others, the FSSD consolidates the latest scientific consensus in four key elements:

1. the five level model: structuring the system complexity into actionable pieces, while keeping its wholeness<sup>XLVIII</sup>
2. the funnel and principles methodology: illustrating how current unsustainable consumption practice narrows environmental, societal and business

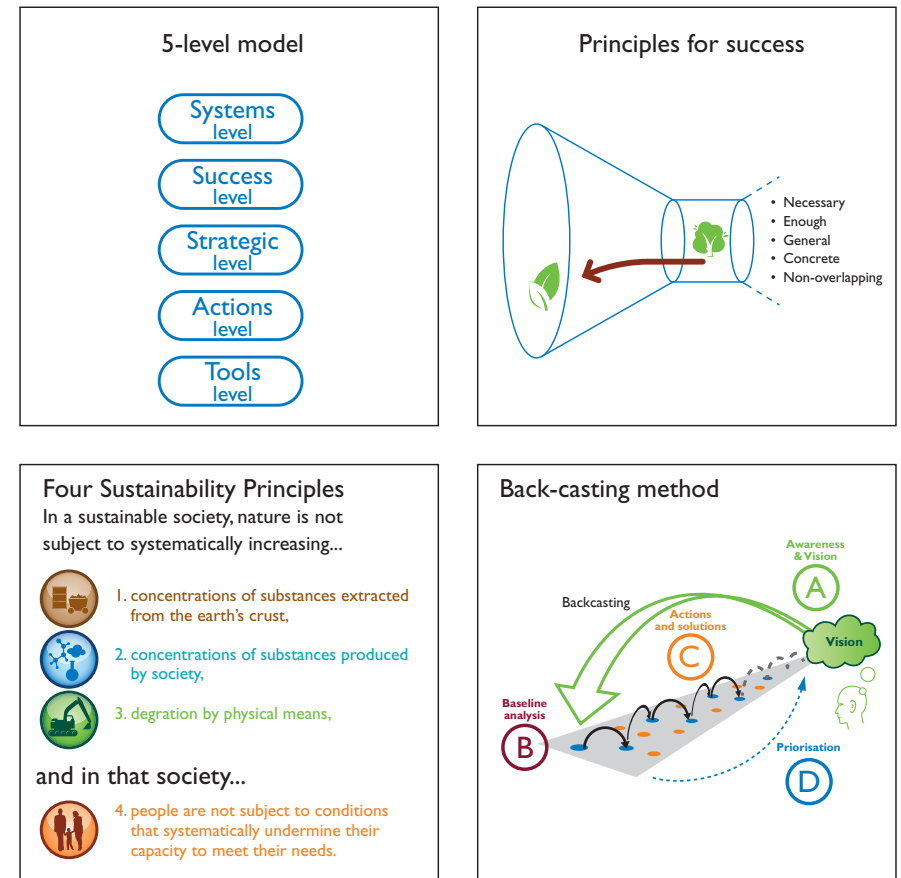
leeway and which types of principles can guide the way towards a sustainable society

3. the four sustainability principles: providing clear, non-negotiable boundary conditions<sup>XLIX</sup> for establishing healthy societies, thus eco- and social systems<sup>L</sup>
4. the back-casting from principles methodology: facilitating effective short-, mid- and long-term action planning.

Applying the FSSD for business planning has proven to deliver genuine win-wins. Speaking about it, Ray Anderson, founder and chairman of InterfaceFLOR, said: "As we climb Mount Sustainability with the four sustainability principles on top, we are doing better than ever on bottom-line business. This is not at the cost of social or ecological systems, but at the cost of our competitors who still haven't got it."<sup>LI</sup>

Of course, many stakeholders have a role to play. Governments can drive the right market conditions through regulation and incentives; businesses can make it easier for people to live in balance with the planet by enabling sustainable lifestyles. Thus next, we focus on how sustainable innovation is both social and sociable.

## Framework for Strategic Sustainable Development (FSSD)



Source: The Natural Step, Sweden



# Social innovation

*If you want to go fast, walk alone. If you want to go far, walk together – Elke Löffler et al.<sup>LII</sup>*

## Balancing individual and societal needs

Above all, sustainable innovation is wide-ranging and people-focused. Social cohesion and new ways of living are an integral part of Vision 2050, fostering an understanding of what it means to be interdependent and responsible for one's own actions, for each other, for the planet and for future generations. Innovations in technology and science are enablers, but not the drivers.

In practical terms, bringing about the Vision 2050 world depends as much on social constructs – legislation, community organization and business models – as it does on technology. We are moving towards the age of socially-led innovation described in *Powerful momentum*, and explained more extensively by Josephine Green in *Democratizing the Future*.<sup>LIII</sup>

In the current economic paradigm, innovation is primarily driven by the need for businesses to make profits and grow, frequently with little concern for social or environmental costs (although this is beginning to change). Technology-led innovation delivers physical objects like TVs and phones.

Market-led innovation offers experiences like personalized TV channels and phones that play music and run apps.

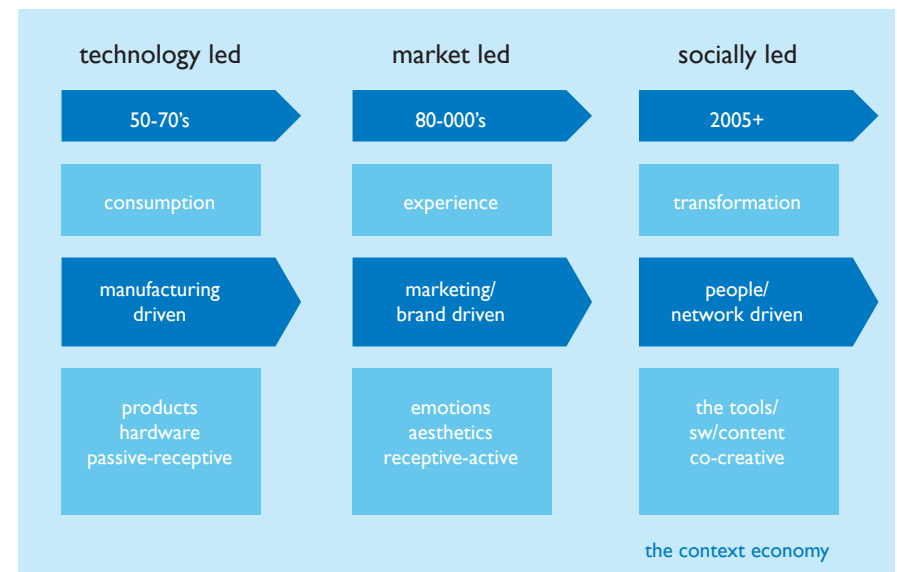
Social innovations, in contrast, are typically sources of well-being and shared benefits such as patient-led healthcare, distance learning, fair trade, or Wikipedia.<sup>LIV</sup> They are “...new ideas that simultaneously meet social needs and create new social relationships or collaborations... that are both good for society and enhance society's capacity to act.”<sup>LIV</sup>

Furthermore, social innovation normally acts in a systems changing way. It involves diverse groups cooperating around shared purposes and values. It means building bridges between all kinds of stakeholders; collaborating in new ways; embracing decentralization, self-organization and letting ideas flow and develop freely.

Business can't stand apart from this. Social innovation is a strategic issue as Collins and Porras pointed out in their book *Built to Last*.<sup>LVI</sup> “The next wave of enduring great companies will be built not by technical or product visionaries but by social visionaries – those who see their company as part

of society and how it operates as their ultimate creation and who invent entirely new ways of organizing human effort and creativity.”

## The evolution of innovation



Source: Josephine Green: *Democratizing the future*, 2007

# Collaboration

Swift, radical and coordinated actions are required at many levels, by multiple partners – WBCSD, Vision 2050 Report

## Together in action

The remarkable news about the sustainable innovation opportunity is how many people are already on board. Faced with complex problems that established social and market structures can't solve, many individuals, communities and businesses have decided to take responsibility and act directly for the well-being of people and the planet.

Sometimes this action is local and short-term. Often it's aligned with others and built around long-term goals such as the work of the WBCSD (World Business Council for Sustainable Development).

It's impossible to cite them all, but a few examples reveal the breadth and depth of this self-motivated action. At international level, the Green Economy Coalition,<sup>LVI</sup> for example, brings together a wide variety of civil society organizations and globally active NGOs. They are working together to prepare the ground for a fair, inclusive economy, respecting the planet's natural boundary conditions

At city level, the C40<sup>LVIII</sup> unites large cities from around the world committed to

tackling climate change. Representatives from many of the world's leading urban centers share challenges, learn from each other's experiences, and leverage existing knowledge.

On a community level, individual citizens are not waiting for governments, institutions or business to act for them. Initiatives like the Transition Towns<sup>LIX</sup> movement are spreading round the world, mobilizing people's knowledge and energy to build a sustainable future.

These, and a host of other groups from Doctors without Borders to the WiserEarth movement<sup>LX</sup>, express people's belief in a better world and their willingness to take responsibility as individuals, professionals, global and local citizens and part of nature.

Millions of people all over the world are putting aside narrow self-interest and fear of the unknown to take action themselves.

## Collaborating: a global trend





## Part III

### Innovation and Sustainability @ Philips

Understanding where Philips comes from, where it is now and where it might go

# Where Philips comes from

*Whichever angle you come from, you try to meet a need of a community or an economy, both from an economic perspective and from a development angle* – Gerard J. Kleisterlee, CEO of Royal Philips Electronics<sup>LXI</sup>

## Philips sustainability legacy

Putting people at the center of their business, Philips' founding fathers embedded sustainability at the heart of their company since its earliest days. Already in the early 20th century Philips employees benefitted from schools, housing and pension schemes.

In the early 1970s Philips participated in the Club of Rome's *The Limits to Growth*<sup>LXII</sup> dialog. And in 1974 the corporate environmental function was established, initially to create transparency on compliance with environmental laws and health & safety regulations. In 2003, a structured sustainable supply chain program was introduced.

The same year, Philips' Environmental Report (first published in 1999) was extended into a Sustainability Report. This is now integrated into the Philips Annual Report, signaling full embedding of sustainability in Philips' business. Philips began setting corporate sustainability targets through its EcoVision programs in 1998, with green innovation targets first defined in EcoVision4 in 2007.

Philips' involvement in the WBCSD dates back to 1992, when the Council was set up in the wake of the first Rio Earth Summit.

## Philips innovation legacy

Philips' innovation legacy dates back to its foundation in 1891. In 1914, Philips Research was established to fuel the company with innovative technologies. And since the mid 1920s, Philips Design has complemented technology with aesthetic and human perspectives. Today, Philips' multi-disciplinary, multi-cultural employee base continues this tradition of creativity, as reflected in its array of innovations and high patent output.

Philips has adjusted its innovation approach several times, anticipating major changes in society. In recent decades this resulted in the opening of an Experience Lab in Eindhoven and the extension of the traditional technology driven product creation process towards end-user driven innovation.

Philips is recognized as a leader in Open Innovation. In the late 1990s the closed Research Laboratories transformed towards a vibrant High Tech Campus, now hosting over 80 non-Philips business entities. During the last decade, our focus was "inside-out" based on teaming up, incubation and spin-outs. The next step will be to increase our "outside-in" effectiveness in co-creating sustainable systems solutions.

## Strong track record in sustainability and innovation



Source: [www.verhalenvanvroeger.nl](http://www.verhalenvanvroeger.nl)

# Where the company is now

Philips sustainability strategy is focused both on the reduction of risks as well as the pursuit of market opportunities... Philips is leading in many areas – Alexander Rinnooy Kan, President of the Netherlands' Social and Economic Council (SER)<sup>LXIII</sup>

## Vision 2015 and EcoVision5

In September 2010, Philips set out its own next steps on the pathway to action with Vision 2015,<sup>LXIV</sup> stating: *Philips wants to be a global leader in health and well-being ...to simply make a difference to people's lives with meaningful, sustainable innovations.*

Philips EcoVision5<sup>LXV</sup> program for 2010–2015 establishes concrete targets for sustainable innovation:

- To bring care to 500 million people
- To improve the energy efficiency of our overall portfolio by 50%
- To double the amount of recycled materials in our products as well as to double the collection and recycling of Philips products.

On sustainable innovation, the Philips Annual Report 2010 states: *Green and Social Innovation are the building blocks for Sustainable Innovation. Green Innovation focuses on reducing the Environmental or Ecological Footprint of our products. Social Innovation comprises contributions to the improvement of the Human Development Index (HDI).*<sup>LXVI</sup>

## Philips Innovation Areas

Innovation in Philips is managed using a 4x4 matrix which maps innovation types against the market life cycle. The three innovation types are:

- **Roadmap:** strengthening the core business
- **Adjacencies:** new to Philips, creating profitable adjacent business
- **Breakaway:** new to the world

Philips' Sectors have worked closely with the various units of Philips Corporate Technologies to define a portfolio of innovation areas and topics designed to safeguard Philips' future business success.<sup>LXVII</sup>

These innovation areas embrace several major social trends:

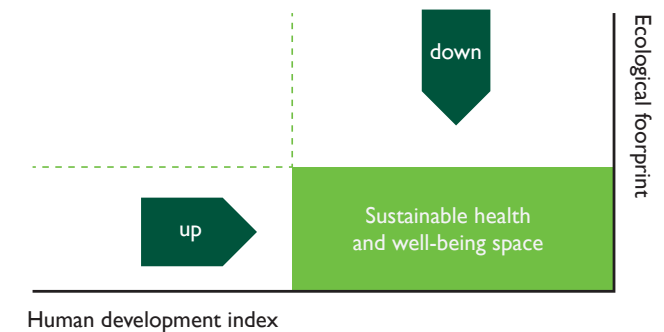
- aging populations and the growth of chronic disease
- increasing (healthcare) needs in emerging economies
- material scarcity & climate change
- lifestyle changes

As a result, aspects of sustainability are implicitly embedded in many innovation activities.

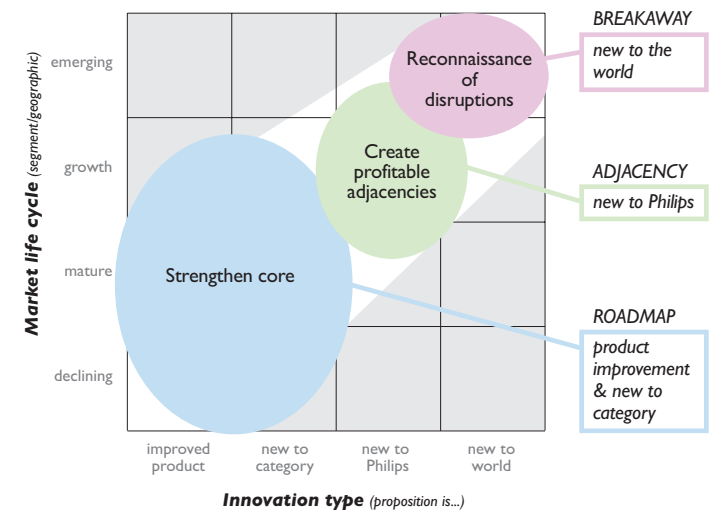
Looking at both Vision 2015 and Philips EcoVision5, there is evidence that the innovation and sustainability agendas are starting to

converge. Thus in the long-term, all Philips' innovation activities may in one way or another contribute to sustainable development.

## Sustainability at the heart of health and well-being



## The 4x4 innovation matrix



# Where it might go

The risk of inaction is the greatest risk facing business – Idar Kreutzer, CEO Storebrand ASA and Co-Chair of Vision 2050

## Aspiring to higher purposes

What of the long-term future? Philips' mission "to improve people's health and well-being through timely introduction of meaningful innovations" is in itself an expression of a desire to pursue sustainable innovation. And as mentioned in the introduction, it resonates with the WBCSD's Vision 2050 "in 2050, some 9 billion people live well, and within the limits of the planet".

Moreover, Vision 2050 – like EcoVision5 – is rooted in the notion of plotting nations' scores on the UN's Human Development Index against their Ecological Footprint.<sup>LXVIII</sup> Thus Philips' ambition to contribute to sustainable health and well-being: to improve people's health and well-being while respecting the limits of natural resources and Vision 2050 are essentially the same idea expressed in different wordings.

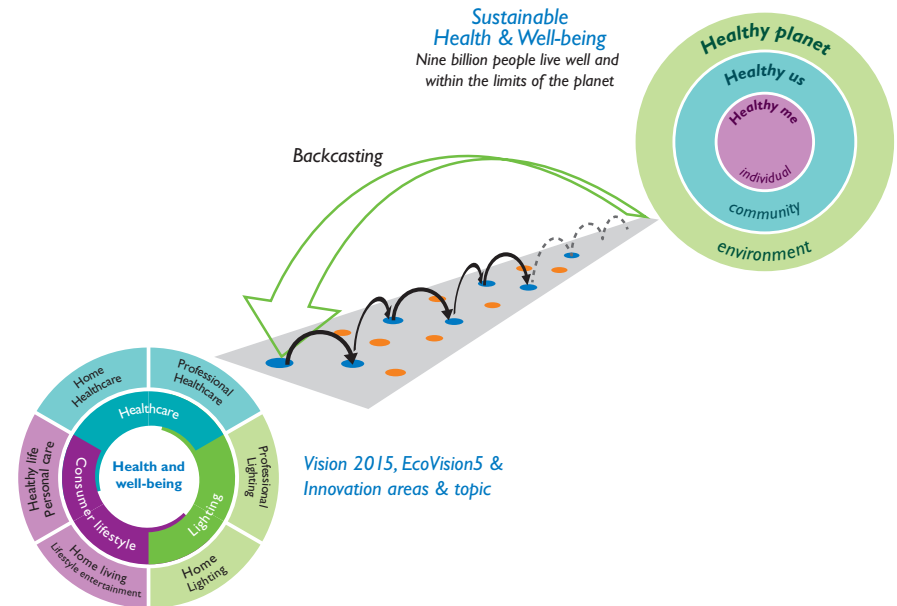
This is why Vision 2050 is both highly relevant for Philips and an inspiration for action. Moreover, it provides new ways to think about the road ahead. Unlike earlier "futures projects"<sup>LXIX</sup> in Vision 2050 the WBCSD deliberately adopted a visioning

and back-casting approach – that is, starting from the desired end-state and looking at how to achieve it.

Vision 2050 also breaks new ground in being holistic. While many WBCSD projects have looked at industry sector specific sustainability challenges and opportunities, Vision 2050 acknowledges that sustainability-related challenges are interconnected. It recognizes the need for a cross-industry, beyond-markets approach to enable the vision. Or in Philips terminology: it's about *next generation open innovation and co-creation*.

How to achieve such visions? The back-casting methodology used in Vision 2050 provides a powerful tool.<sup>LXX</sup> For Philips, EcoVision5 and the company's current innovation areas and topics could act as the baseline. Then by detailing what sustainable health and well-being should look like in a world where the individual (*the healthy me*) acknowledges his/her interdependence with their community and society (*the healthy us*) and his/her environment (*the healthy planet*), pathways between now and visions of 2015 and 2050 can be defined.

## Philips 2050???





Connection Day at Van Abbemuseum, Eindhoven 2009

## Part IV

### Strategies to drive sustainable innovation

Introducing new rules of the game enabling companies to merge business and sustainable development agendas

# Ingredients of high impact sustainable innovation

*When future generations judge those who came before them on environmental issues, they may conclude "they didn't know": let us not go down in history as the generations who knew, but didn't care –*  
Mikhail Gorbachev

## How do we do this?

Having understood the nature of humanity's dilemma, its boundary conditions, and defined a vision of a desirable future, what strategies can you adopt to reach this vision?

As organizations around the world start to act, experience and expertise is beginning to build. From that, four key strategies are emerging that will advance society and businesses on the pathways set out in Vision 2050:

### Build relationships towards a higher purpose

Sustainable innovation is challenging. To work together successfully, innovators need to *share this higher purpose* beyond personal and business interests. They need to build the trust that *dares to dream* and to co-create new visions based on common values.

### Enable sustainable lifestyles

The business *opportunities* of Vision 2050 are huge. Companies that seize them will focus on fulfilling fundamental needs, rather than creating desires, thus on

delivering *well-being* so people can *live well* in a *healthy environment* and a *healthy society*.

### Create multi-stakeholder value

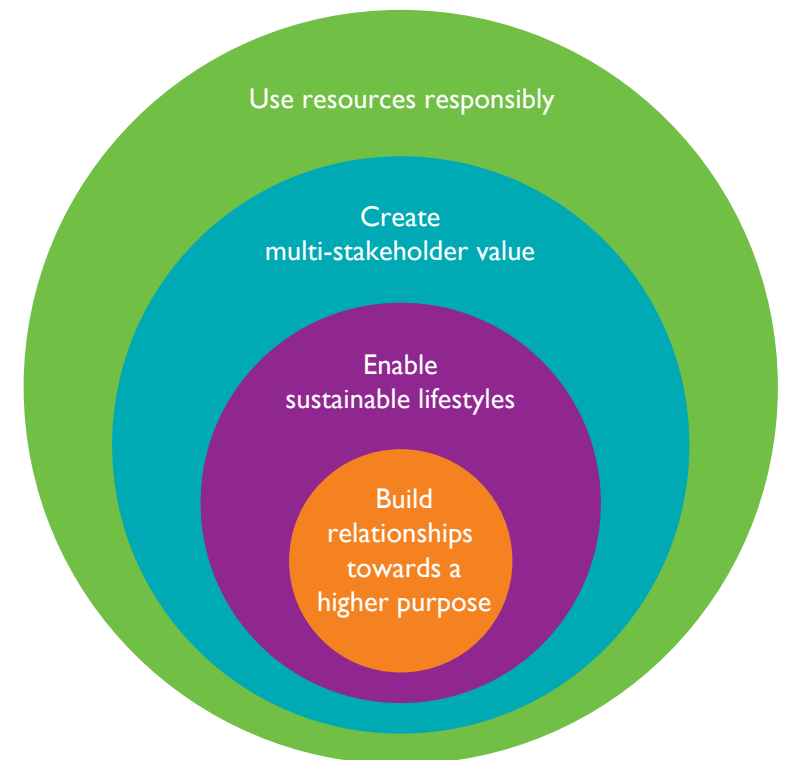
Sustainable innovation is not done alone. It involves working with partners throughout society to create *value* that is distributed *fairly* and is *transparent for all*.

### Use resources responsibly

Whether they are physical (metal, wood, oil, etc.) or human (people, knowledge, technology, etc.) resources are valuable. Using them responsibly means starting at a *system level* and *envisaging potential impacts* on users, society and environment, based on the four sustainability principles – and so, ensuring *eco-systems* that are conducive to life.

In Part IV, we first explore these strategies, looking at lessons from traditional innovation, and where sustainable innovation calls for new ways of thinking and working. Each strategy is illustrated with Philips examples. For clarity, these are drawn from specific sectors, but of course, each strategy applies more widely within Philips and beyond.

## Interconnected sustainable innovation strategies





# Build relationships towards a higher purpose - the strategy

The most important ingredient we put into any relationship is not what we say or what we do, but what we are – Stephen R. Covey

## Trust in innovators' values and conscience

Sustainable innovation brings people together in new ways. In your personal life, you could find yourself in a community action group working closely with the local authority. Or you might be part of a project testing new sustainable technologies in a real-world pilot that brings together business, local residents and your city government. At work, you could be developing new system solutions with commercial partners and NGOs.

But since sustainable innovation touches on fundamental values and interests, it will often provoke strong views and sometimes powerful disagreement. So the first strategy for creating a sustainable future is to build resilient relationships with the strength to withstand the challenges of pursuing vision-ary goals in new territories.

That resilience comes from having a shared common purpose beyond each participant's personal interests. This shared higher purpose is the basis for trust. It allows people to dream together and gives them confidence to pursue their dreams. It helps to

find the appropriate language, understand each other's perspectives, and co-create solutions that benefit diverse individual and social needs.

At a time of global economic disruption; skepticism towards corporations, "experts" and politicians; and growing environmental pressures; trust of any kind may seem in short supply. Nonetheless, there are proven frameworks to help establish resilient relationships within groups and between them.

Tuckman's model for performing teams<sup>LXXI</sup> is equally effective in the context of sustainable development as it is in traditional business. David Bohm's "art of dialogue"<sup>LXXII</sup> can provide the space and openness to recognize and address divergent opinions.

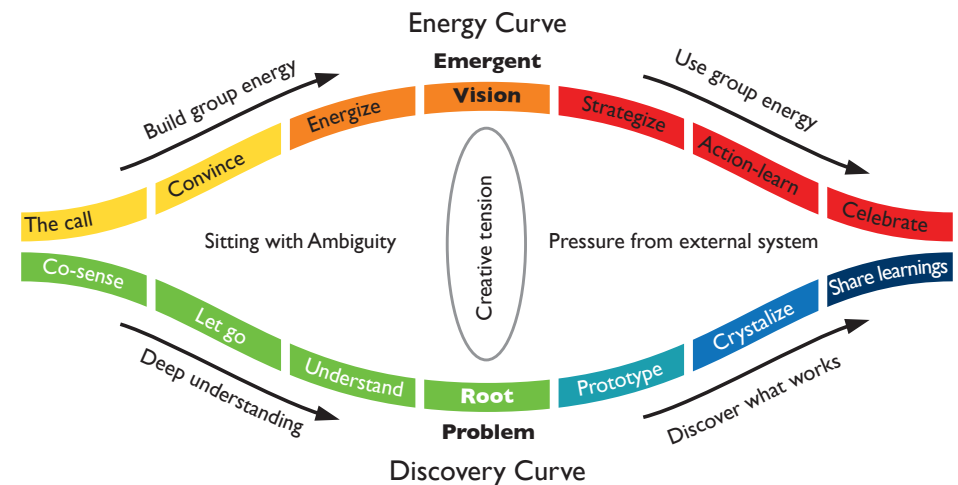
Moreover, with the right conditions and tools, people have a remarkable capacity for self-organization and to naturally generate meaningful, context-relevant solutions.<sup>LXXIII</sup>

Think of open source software initiatives, micro-finance<sup>LXXIV</sup> and online movements such as the WiserEarth<sup>LXXV</sup> initiative. These do not require top-down, hierarchical, control and command behaviors to innovate successfully.

Such relationships can exist in corporate environments through engagement, embedding, and empowering people. Companies based on multi-stakeholder

engagement like leading UK retail chain *John Lewis*; Spanish industrial cooperative *Mondragon*; and hydrogen fuel cell car company *riversimple* are good examples.

## A path to shared action



Source: inspired by: Large Scale Collaboration towards Sustainable Development by Juan Carlos Kaiten, Sonja Niederhumer Kara Stonehouse, Master's Programme in Strategic Leadership Towards Sustainability, 2010

# Build relationships towards a higher purpose - Philips examples

*I've come into contact with Philips in many ways recently. In these contacts, I have been impressed by Philips' customer focus and interest in co-creation* Pieter Hameetman, Director of Sustainability, AM real estate development (part of the BAM Group)

## Engage – embed - empower

Philips is applying the three steps of “engage, embed and empower” in its efforts to build relationships towards the higher purpose of sustainable health and well-being.

For instance, in 2010 over 3,500 Philips employees engaged in their local community through the global SimplyHealthy@ Schools program. The program ran in 38 countries, reaching almost 63,000 students in over 660 schools. In the US, Philips sponsors the American Heart Association's Heart Walk initiative. And in China, it collaborates in project HOPE<sup>LXXXVI</sup> on chronic disease management – to name just a few examples.

As a company, Philips cooperates with universities, academic and complementary business partners in non-competitive technology development and industry standards from Blu-ray to ZigBee. Its unique Design Probes<sup>LXXXVII</sup> create connections with trend-setters. And sector-level initiatives such as Philips Healthcare's online learning platform for healthcare professionals<sup>LXXXVIII</sup> enable industry-wide sharing.

Philips also co-shapes its business and innovation context: for instance, it co-founded EFQM (a global foundation for excellence in quality management)<sup>LXXXIX</sup> in 1988. In 1965, Dr Hendrik Casimir, then head of Philips NatLab, was the first president of EIRMA (the European Industrial Research Management Association).<sup>LXXX</sup> More recently in 2009, Philips contributed to EIRMA's *Responsible Partnering Handbook*<sup>LXXXI</sup>.

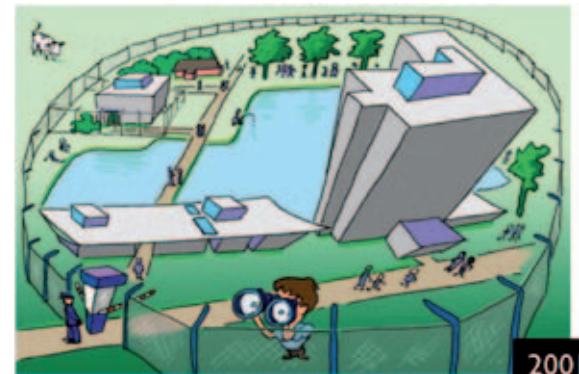
Since 2007, all Philips innovation has been geared towards one shared goal: to be a global leader in health and well-being. The EcoVision5 targets add the sustainability perspective, and ideas in these areas continue to develop. Among others, through the Philips Center for Health and Well-being, which runs multi-stakeholder think tanks on *Livable Cities* and *Active Aging*?

Furthermore, Philips engages directly with consumers on sustainability. Its *asimpleswitch* website launched in 2007 invites thinking around values and goals associated with climate change. Today, this site is evolving to provide greater interactivity and to include other topics such as biodiversity.

Biodiversity was mentioned explicitly in Philips 2010 Annual Report for the first time and Philips is currently working with the International Union for Conservation

of Nature (IUCN) on how to balance human needs for lighting with wildlife's need for natural night in coastal areas.<sup>LXXXII</sup>

## From closed innovation to co-creation at Philips Research in Eindhoven



Source: Henny Herps, Philips

# Enable sustainable lifestyles - the strategy

Three grand essentials to happiness in this life are something to do, something to love and something to hope for – Joseph Addison

## Serve people's fundamental needs; respect the planet's limits

This strategy is about enabling people to enjoy prosperity and well-being that nurtures rather than consumes the planet's resources. "Green" products and "closing the loop" are key first steps. But they remain part of the consumer system which elevates consumption to a social goal, an outward (if misleading) symbol of well-being.

Mass produced products have become part of humanity's symbolic language. We use them to express our identity, values and our social status. Commercial interests have turned religious, seasonal, and cultural festivals into moments for added consumption.

Enabling sustainable lifestyles starts by challenging this situation. Does a product or service fulfill *real* needs and improve lives? Or simply fuel wasteful consumption? Re-connecting to the purpose of our own lives, we can ask: what do I really need? How much is enough?

And businesses can help make it easier for people to fulfill their needs sustainably. Many people are aware of environmental and social issues, but their concerns don't translate into buying decisions (see *A Chasm to Cross*). Research suggests people need to feel empowered to make choices for sustainable consumption. It's about what matters to consumers, not the corporate desire to "do good".<sup>LXXXIII</sup>

Clear information and labeling are essential. Consumers are often confused by "green" claims and suspicious of corporate "green wash". Here multi-stakeholder approaches can build trust through collective credibility. For instance, through initiatives like the Global Reporting Initiative that ensures corporate transparency. Or through certification schemes like the Marine Stewardship Council that promote good practice in industry and provide trustworthy information for shoppers.

In the words of the World Economic Forum: "Changes in lifestyles and consumption habits will be needed from consumers, not just an expansion of the number of "green" consumers; businesses will need to define new business models, focused

on value creation rather than material throughput; work towards closed loop systems ...governments will need to institute enabling policies and regulations that price resources at their true cost and measure sustainable prosperity at its true worth for future generations."<sup>LXXXIV</sup>

This will be a long journey, yet courageous leaders are taking the first steps.<sup>LXXXV</sup>

## Well-being from fulfilled needs



Source: Manfred Max-Neef as quoted in The Natural Step, Sustainability Primer

# Enable sustainable lifestyles – Philips examples

Philips really cares about a sustainable society and contributes with real action. – De-Hong Tseng, principal of Shi-Lei elementary school, Taiwan<sup>LXXXVI</sup>

## Green products – closed loops – balanced lifestyles

There are many practical ways to enable sustainable lifestyles. Philips has identified three stages where it can make a key impact: greening its product portfolio, closing the material loop and enabling balanced lifestyles.

Offering consumers more sustainable alternatives to “traditional” products is the first step. Philips introduced its “Green Products” in 2004 and by 2010 they already accounted for 37.5% of overall sales. The target is to reach 50% in 2015.

In addition, Philips Consumer Lifestyle has recently launched its first “Cradle to Cradle” inspired products. One is the Performer EnergyCare, an extremely energy efficient vacuum cleaner, made 50% from post-industrial plastics and 25% from bio-based plastics. Another is the award-winning Econova LED TV, which consumes 60% less power than its predecessor, comes with a solar-powered remote control and is completely free of PVC and brominated flame retardants.

Philips is also focusing on specific local needs. For instance, Philips China has introduced a new category of water purification, air cleaning and food cleaning devices tailored to that market. And the company is providing consumers worldwide with new choices such as vacuum cleaners, hair dryers and irons which deliver a better experience rather than unnecessary higher power. It's a disruptive approach that simplifies going “green” – making it easy and pleasant to shift to less energy-hungry devices.<sup>LXXXVII</sup>

To close the material loop further, Philips is exploring evolving take-back and recycling scenarios with specialists in waste management. What is acceptable to consumers and where will legislation be required to drive adoption? How can the necessary reverse logistics chains be developed? This complex task may call for local for local solutions to reflect varying local consumer attitudes and lifestyles.

At the same time, a sustainable materials program within Philips seeks to identify effective pathways to phase out hazardous materials, create independence from

potentially scarce materials, and increase resource effectiveness when using recycled materials. Initiatives like these pave the way to increase sustainability beyond Philips’

current Green Key Focal Areas towards fully acknowledging the first and second FSSD sustainability principles.

## Some current Philips tools to communicate about sustainability



Energy consumption



Packaging



Hazardous substances



Weight



Recycling and disposal



Lifetime reliability



[asimpleswitch.com](http://www.asimpleswitch.com)

source:

<http://www.philips.com/about/sustainability/index.page>

<http://www.asimpleswitch.com>

# Create multi-stakeholder value — the strategy

*A business that makes nothing but money is a poor business — Henry Ford*

## Combine to ensure $1 + 1 + 1 > 3$

Innovating with multiple stakeholders also means understanding what each party brings to the cooperation and how each can gain value from it. For business, it's vital to appreciate how this multi-stakeholder approach to innovation shifts the focus from cost-management to value creation for all involved. Companies and organizations will often have to let go of the notion “my profit” or “my advantage” and think instead of “our value” and “our well-being”.

Similarly, for individuals, participation is not necessarily about money; it's about value and that can have many meanings. Especially since, as Manfred Max-Neef and others have shown, after a certain point having more “stuff” — more material wealth — does not bring further well-being.<sup>LXXXVIII</sup>

So this third strategy also means identifying how multi-stakeholder value can be defined and made transparent. How can the required data be shared among different stakeholders on a non-competitive basis?

Establishing a common vision and plan are key. A mechanism like “charretting”<sup>LXXXIX</sup>

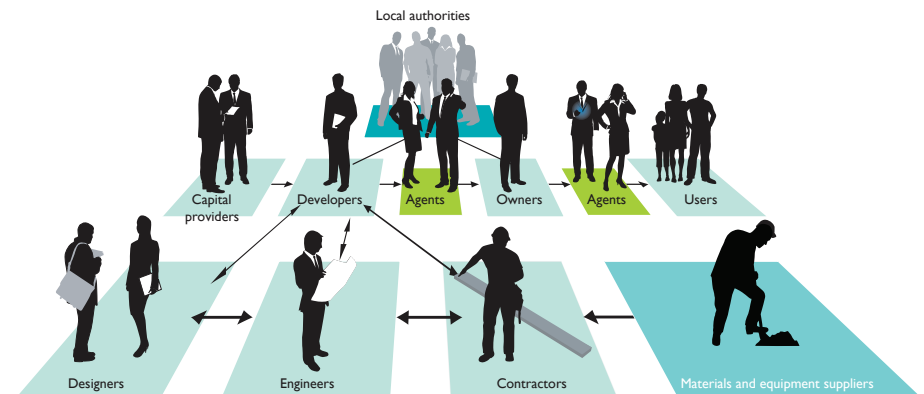
can be a valuable way to co-create ideas and pathways, even with large and diverse groups of stakeholders. It enables people to identify insights and build alignment in small sub-groups before these are consolidated. Successful charrettes encourage joint ownership of solutions, defuse confrontation and encourage buy-in from all involved.

To give just two examples: at a local level, a number of stakeholders in the city of Utrecht, the Netherlands, used the charrette technique to define requirements for the “most sustainable” Dutch urban development area. One result was the idea of establishing a “Community Lab”.<sup>XC</sup> This lab will both facilitate development of products and solutions which support sustainable lifestyles and explore new financing and ownership models required to implement them. On a global level, a good example is the WBCSD's exploration of how the many stakeholders concerned can work together to develop energy efficient buildings.<sup>XCI</sup>

At the same time, initiatives are emerging to bring greater transparency into activities directed at sustainable development. The Impact Reporting and Investment Standards (IRIS),<sup>XCII</sup> for example, aims to

“provide a common reporting language for impact-related terms and metrics”, focused on non-financial data that can be used for performance comparisons and benchmarking.

## Multiple stakeholders in value networks



Source: WBCSD, *Facts and Trends, Energy Efficiency in Buildings, 2008*

# Create multi-stakeholder value — Philips examples

*The contributions made by Imaging the World and Philips have proved to be a turning point in the healthcare for the people of this region. — Dr. Alphonsus Matovu, general surgeon, Kamuli Mission Hospital, Uganda*

## Social solutions — balance benefit — healthy society

Sustainable innovation is not done alone. It involves working with partners throughout society and recognizing that the value created has many “currencies”. For one stakeholder group value may be financial, for others it may be votes, tons of CO<sub>2</sub>, jobs created, years of independent living, lives saved, etc.

This kind of multiple benefit value creation is clearly seen in healthcare — an industry with many stakeholders from patients to governments. It’s also an industry facing huge challenges: aging populations, growing chronic disease, staff shortages and rising costs. Philips care cycle approach aims to provide an effective platform to engage with multiple stakeholders in this context. It enables better patient outcomes at lower cost by covering the complete cycle of prevention and diagnosis, treatment and therapy, monitoring in hospital and at home, and disease management and surveillance.

Medical technologies are part of this, including solutions adapted to local needs

such as the Philips Allura FC, a multi-purpose “value” cath lab tailored for emerging markets. So are innovative new ways to create multi-stakeholder value such as financing solutions. For example, Philips’ MediServ program allows hospitals to acquire equipment without capital expenditure. Akershus University Hospital in Oslo, Norway, equipped an entire radiology department (performing 200,000 examinations per year) through MediServ, with cost savings of up to 30%.

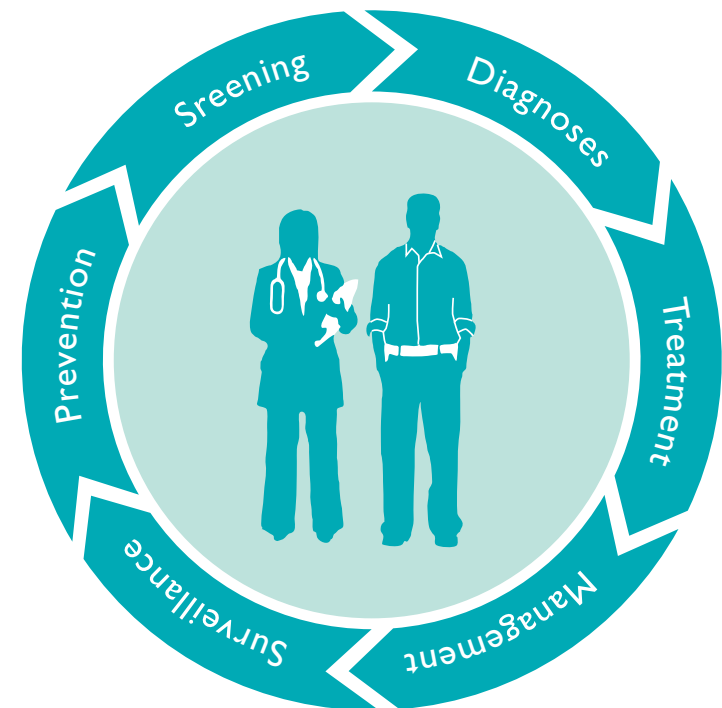
A related program, Philips’ MediQuip provides “end to end” financing such as in a 7-year infrastructure project in Zambia, which brought up-to-date diagnostics closer to rural communities and touched 71 hospitals. Philips conducted the feasibility study, project design and implementation, as well as providing training for local healthcare workers.

Initiatives like these support Philips’ ambition, expressed in its EcoVision5 targets, “to touch 500 million lives by 2015”. Other examples include a partnership between Philips and the Chinese Ministry of Health to train over 1000 county physicians on leading-edge breast cancer screening tech-

niques to improve the lives of women in remote rural areas. And in Africa, Philips is working with non-profit organization, Imag-

ing the World (ITW), with a first objective of bringing ultrasound imaging to women in rural Uganda.<sup>XCIII</sup>

## The Care Cycle approach



# Use resources responsibly – the strategy

Put differently, we have gotten into our predicament today because of a way of thinking that focuses on parts and neglects the whole – Peter Senge, *The Necessary Revolution*

## Look further and envisage impact

The fourth strategy is systems thinking applied to the physical and societal world. In everything we do, we use resources: physical materials, people's time and skills, humanity's accumulated knowledge and technology. By using these responsibly – that is to say, considering the impact of their use from the outset of the innovation process – we can create inter-connected solutions. And we can limit the risks of the unintended consequences of technology and human lifestyles on society and the environment.

This implies radical change: “The long perspective is completely unlike the single reuse of “popular” recycling, when your plastic bottle becomes your parka...and in five years the parka goes to exactly the same dead-end cradle-to-grave where a few years earlier your bottle would have gone.”<sup>XCIV</sup>

In effect, it's reframing: starting not from a product perspective but from a systems view, and applying the right system boundary conditions (see page 28) and tools.

Tools like traditional Life Cycle Analyses “...often lack a sustainability perspective and bring about difficult trade-offs between specificity and depth on the one hand, and comprehension and applicability on the other”. The strategic focus should be “smart stepping-stones toward sustainability” rather than relying solely on “the least harmful option right now.” “The potential for leapfrogging and for preventing investments that may lead to dead ends in which present problems are replaced with other ones in the future is also probably greater with the bird's-eye perspective.”<sup>XCIV</sup>

This bird's-eye or whole system view is a distinctive feature of the Natural Step's Sustainability Life Cycle Assessment (SLCA)<sup>XCIV</sup> approach. It embodies long-term systems-thinking, enabling companies to assess the impact of products through their whole lifecycle in relation to the four sustainability principles.

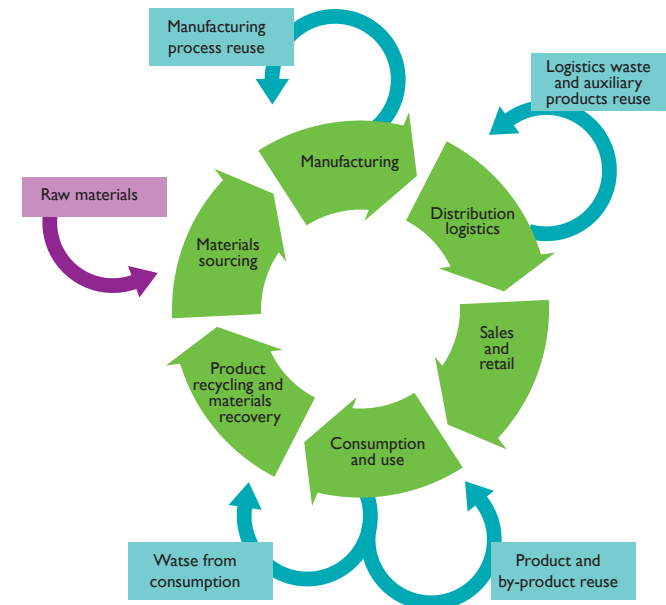
Responsible use of technology also means recognizing and leveraging the inter-connectedness of different technology platforms, developing ways to design for disassembly, recyclability and upgrading.

It requires a paradigm shift from wasteful linear processes to “closed loop” design and production.

In nature, there is no waste. Indeed, a lot can be learned from natural ecosystems

and mimicking them. We live within a finite system. When we destroy environments and exhaust resources, we are reducing the planet's ability to support prosperous life. Our health and well-being depend fundamentally on a healthy planet.

## The closed loop value chain



Source: Deloitte via [http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Images/Full%20Size%20Images/us\\_LinearandClosedloopmodels\\_500x428\\_101910Fig1.jpg](http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Images/Full%20Size%20Images/us_LinearandClosedloopmodels_500x428_101910Fig1.jpg)

# Use resources responsibly – Philips examples

*Philips is such an incredible platform, with almost all the technologies for sustainable development.* – Joanna Rubinstein, Earth Institute Center, Columbia University

## Envisage impact – co-create systems – enrich life

Enriching life through technology and knowledge is the ultimate goal of responsible resource use. And envisaging possible social and environmental impacts is a crucial pre-requisite for co-creating effective system solutions rather than purely efficient ones.

Efficiency is about making existing solutions better. Effectiveness is about taking the systems perspective and designing for optimal system functioning. Today, the radically new technologies of LEDs and digital controls present an opportunity for this kind of fundamental rethinking in the areas of lighting and building management systems. The key challenge may well be to avoid a re-bounce effect where a technology with a low environmental impact is so widely-used that its benefits are negated.

Philips is bringing the benefits of LEDs both to new applications and retro-fit solutions (which target the massive base of existing lighting installations). In doing so, it aims to unlock their energy and material savings potential, as well as enabling greater free-

dom in lighting design – for instance, embedding lighting systems into construction materials, ceilings, furniture, and textiles.

For outdoors, Philips is developing concepts such as “Light on Demand” intelligent street lighting that saves costs and energy by providing light only when and where needed. And like a growing number of Philips solutions, Light on Demand is being tested in real-life pilots where end-users can provide feedback on their experience.

Philips is also addressing unmet societal needs for basic lighting in developing countries through off-grid LED solutions powered by solar or other renewable energy sources. *Philips’ Cairo to Cape Town Road Show* introduced solutions ranging from floodlights “bringing soccer to communities after dark” to a small LED reading lights enabling children to do their homework in evening hours.

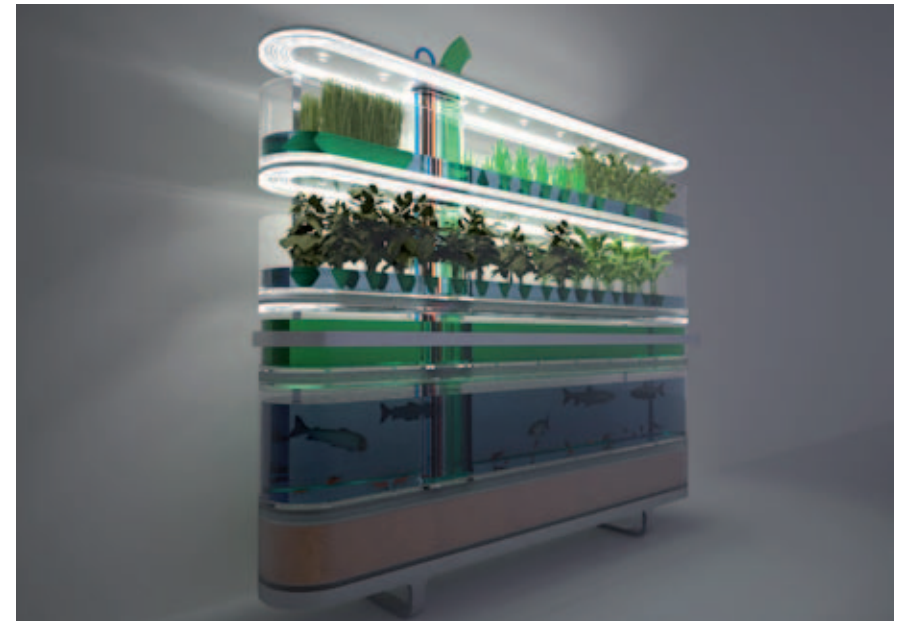
Using technology wisely can also mean adapting it to specific human needs. Philips Wake-up light has proved particularly valuable for people in northern countries, where winter depression is common.

In a six-week trial – the world’s largest light therapy field experiment – 87% of respondents said they woke up feeling more refreshed, alert and ready for the day.

Besides light directly for people, there is a huge need for advanced horticulture lighting to help create a second agricultural

revolution capable of feeding the growing global population. Currently, Philips Research is translating insights into plant growth processes and related lighting and environmental conditions into claims, validating these in laboratory experiments and large-scale test beds.

## Home farming: a provocative idea from Philips Design



Link: [http://www.design.philips.com/philips/sites/philipsdesign/about/design/designportfolio/design\\_futures/design\\_probes/projects/food.page](http://www.design.philips.com/philips/sites/philipsdesign/about/design/designportfolio/design_futures/design_probes/projects/food.page)



# Final thought

*It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change – Charles Darwin*

## Sustainable innovation - a new innovation paradigm

What makes a company a leader in innovation? Firstly, its ability to understand market dynamics, to anticipate user needs and serve them in surprising new ways. Secondly, its ability to transform its employees' knowledge and skills into products and services that are of value in the marketplace. And thirdly, its ability to lead change in a profitable way.

All long-lived companies have ridden several *waves of innovation* – the emergence of new technologies that have successively shaped the global industrial and social landscape since the Industrial Revolution. Over that time, successful companies have adopted a variety of innovation approaches to respond to these changes, shaping progress and maintaining business success.

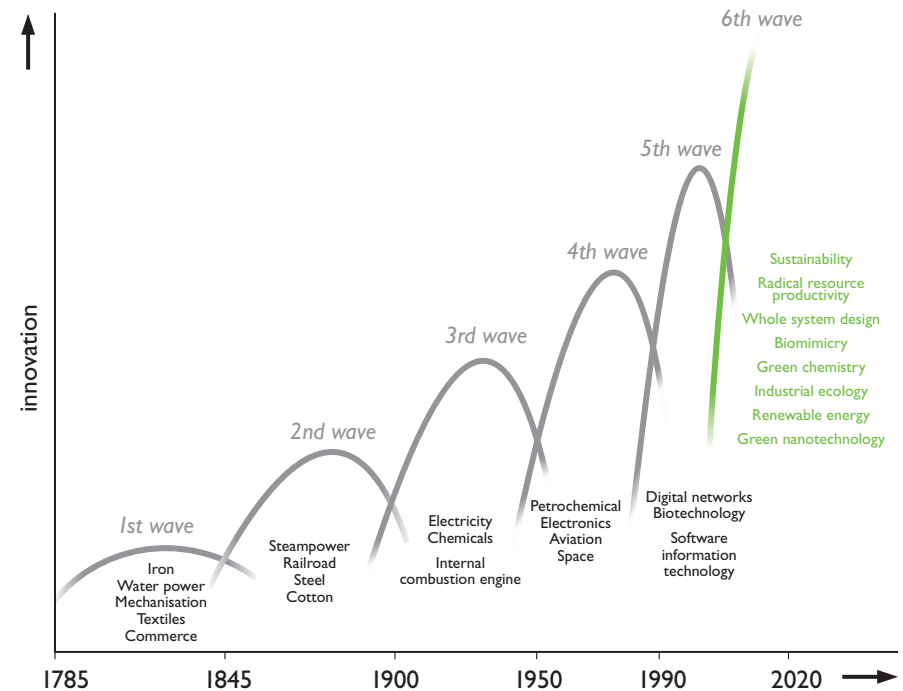
Now, as set out in Vision 2050 and many other publications, businesses everywhere are facing a new wave. Humanity is confronted with major challenges like climate change, aging populations, stressed healthcare systems, and scarcity of natural resources.

Against this backdrop, this book explores the new paradigm of sustainability-led innovation (also known as socially-led innovation) and links it to Vision 2050, or sustainable Health and Well-being, as Philips calls it, as a desired end goal. It characterizes the nature of this emerging innovation opportunity and introduces four sustainable innovation strategies that can help us move to effective action.

Undoubtedly, we are at a highly significant moment in our planet's history. We are witnessing and participating in a major transformation. The question is: how to go forward? Nature – and within it humanity – has always been innovative, willing to progress, finding better ways to enable life. This is evolution in action.

Now is the moment to decide whether you want to be part of co-shaping the future. In any case, successful businesses will play an important role by doing what they do best: innovate, adopt, collaborate and execute.

## Waves of Innovation



Source: The Natural Edge Project, 2004  
<http://www.naturaledgeproject.net/Keynote.aspx>  
<http://www.naturaledgeproject.net/NAONChapter1.4.aspx>

# Acknowledgements

This book draws on the vast array of publicly available material, as well as accumulated and on-going research and thinking within Philips Research and the Philips Corporate Sustainability Office. The final content, however, is my responsibility.

I would like to thank Henk van Houten, Henk de Bruin, Fred Boekhorst, Aart van Gorkum, Robert Metzke, Simon Braaksma, Wolfgang Budde, Hans Hofstraat, Koen Huizer, Ferrie Aalders, Lisette Appelo, Golo von Basum, Carel-Jan van Driel, Albert Comberg, Barbara de Kort, Mark Stoffels, Berend Aanraad, Sally Jeanrenaud and Steve Bass for their useful comments and openness to discuss while the content was under construction. I am grateful to Peter Wierenga for encouraging me to work on this book.

A special thank you goes to Susan Wild and Markus Laubscher for their co-crafting of the texts.

*Dorothea Seebode, June 2011*

# Endnotes

## About this book

<sup>1</sup> Specifically, it uses “back-casting”, a method based on imagining a desired best-possible state and then working backwards to define the steps necessary to reach this state.

<sup>11</sup> Innovation: any product or service that is acknowledged by the buyer as new. In innovation literature, incremental innovation means improvement of existing products and services, e.g. a mobile phone with improved battery life. This is distinguished from radical/disruptive/breakthrough innovation which involves new products or services that fundamentally change the way needs are served e.g. a mobile phone in contrast to a land line. Definition inspired by J. Tidd and J. Bessant, *Managing Innovation*, 4th edition, John Wiley & Sons, 2009, page 23ff

<sup>11</sup>In Philips, sustainable innovation is defined as the simultaneous combination of green innovation and social innovation. See also [http://www.annualreport2010.philips.com/content\\_ar-2010/proofpoints/improve\\_footprint.asp](http://www.annualreport2010.philips.com/content_ar-2010/proofpoints/improve_footprint.asp)

## Our human dilemma

<sup>11</sup>[http://www.footprintnetwork.org/en/index.php/GFN/page/earth\\_overshoot\\_day/](http://www.footprintnetwork.org/en/index.php/GFN/page/earth_overshoot_day/)

<sup>12</sup>See for instance: <http://www.un.org/en/>

[globalissues/food/index.shtml](http://globalissues/food/index.shtml)

<sup>16</sup>World Business Council for Sustainable Development (WBCSD), *Vision 2050, The new agenda for business*, 2010, page 34. Or *Vision 2050, The new business agenda in brief*, page 14. Figures based on data from the International Energy Agency, OECD and the World Bank.

<sup>17</sup> Paul Hawken, *Commencement Address to the Class of 2009*, University of Portland, May 3rd, 2009

## Part I

### Change starts with you and me

<sup>18</sup>WBCSD, *Vision 2050, The new agenda for business*, Executive Summary

<sup>19</sup> [http://www.footprintnetwork.org/en/index.php/GFN/page/world\\_footprint/](http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/)

<sup>20</sup>WBCSD, *Vision 2050, The new agenda for business*, page 11, The first mover dilemma

<sup>21</sup> See Stephen R. Covey, *The 7 Habits of Highly Effective People*, Free Press, 1989; *The 8th Habit*, Free Press, 2004

<sup>22</sup> See Peter Senge, *The Fifth Discipline: The Art & Practice of The Learning Organization*, Currency Doubleday, 1990; *The Dance of Change*, Doubleday, 1999; See also Peter Senge, Bryan Smith, Nina Kruschwitz, Joe Laur, Sara Schely, *The Necessary revolution: How individuals and organizations are work-*

*ing together to create a sustainable world*, Doubleday, 2008

<sup>23</sup> See Chris Argyris *Knowledge for Action: A Guide to Overcoming Barriers to Organizational Change*, Jossey-Bass Publishers, 1993

<sup>24</sup> See Seth Godin, *Tribes: We need you to lead us*, Portfolio Hardcover, 2008

<sup>25</sup> See: Manfred Max-Neef, *Human Scale Development*, The Apex Press, 1991

<sup>26</sup> From P. Senge et al: *The Necessary Revolution*, originally in Chris Argyris, *Overcoming Organizational Defenses*, Prentice Hall, 1992, and further developed by Peter Senge et al in *The Fifth Discipline Field book*, Doubleday, 1994.

Further information at [www.systems-thinking.org/loi/loi.htm](http://www.systems-thinking.org/loi/loi.htm)

## The growth delusion

<sup>27</sup> *Yet the gross national product does not allow for the health of our children, the quality of their education, or the joy of their play. It does not include the beauty of our poetry or the strength of our marriages; the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage; neither our wisdom nor our learning; neither our compassion nor our devotion to our country; it measures everything, in short, except that which makes life worthwhile - Senator Robert Kennedy, 1968*

<sup>28</sup> See for instance: <http://people.stfx.ca/rmespi/Lars/BibliographycheckifitisinBIB-TEXJUNE2005/Lawn2003.pdf>

<sup>29</sup> See the *Living Planet Report 2010*, full report, page 72. Downloadable at: [http://wwf.panda.org/about\\_our\\_earth/all\\_publications/living\\_planet\\_report/](http://wwf.panda.org/about_our_earth/all_publications/living_planet_report/) See also the Happy Planet Index, <http://www.happyplanetindex.org/>

[www.happyplanetindex.org/](http://www.happyplanetindex.org/)

<sup>30</sup> Report by the Commission on the Measurement of Economic Performance and Social Progress; Professor Joseph E. Stiglitz, Chair, Columbia University; Professor Amartya Sen, Chair Adviser, Harvard University; Professor Jean-Paul Fitoussi, Coordinator of the Commission, IEP; September 2009

<sup>31</sup> See Michael E Porter and Mark R Kramer, *Creating Shared Value*, Harvard Business Review, January-February 2011. See also: <http://hbr.org/2011/01/the-big-idea-creating-shared-value/ar/>

<sup>32</sup> Tim Jackson, *Prosperity without Growth: Economics for a Finite Planet*, Earthscan, 2009

<sup>33</sup> For an introduction to these topics, see for instance, James Gustave Speth, *The Bridge at the Edge of the World*, Yale University Press, 2009; Molly Scott Cato, *Green Economics*, Earthscan, 2008

## Re-connecting to life

<sup>34</sup> Words attributed to Chief Seattle leader (1780 – 1866) of the Suquamish and Duwamish Native American tribes

## Nature's inspiring systems

<sup>35</sup> <http://www.context.org/ICLIB/IC28/Robert.htm>

<sup>36</sup> See for instance Biomimicry at <http://www.biomimicryinstitute.org/>; *The Natural Step* at <http://www.naturalstep.org/>; and the work of Margaret J Wheatley.

<sup>37</sup> “Consumers” are however starting to challenge the consumer society. See for instance: <http://www.storyofstuff.com/>

<sup>38</sup> See for instance Peter Senge et al,

*The Necessary Revolution*, 2008; Donella H. Meadows, *Thinking in Systems: A Primer*, Chelsea Green Publishing, 2008

<sup>xxxix</sup> See *A new Era to Sustainability; UN Global Compact-Accenture CEO Study 2010*, page 24

Available at: [https://microsite.accenture.com/sustainability/Documents/Accenture\\_UNGC\\_Study\\_2010.pdf](https://microsite.accenture.com/sustainability/Documents/Accenture_UNGC_Study_2010.pdf)

<sup>xxx</sup> See <http://www.daimler.com/dc.com/0-5-7153-1-1125767-1-0-0-0-0-9293-7145-0-0-0-0-0-0.html>

<sup>xxxi</sup> [http://www.newscenter.philips.com/main/standard/news/press/2009/200091022\\_luz\\_verde.wpd](http://www.newscenter.philips.com/main/standard/news/press/2009/200091022_luz_verde.wpd)

## Part II

This innovation opportunity

<sup>xxxii</sup> <http://www.margaretwheatley.com/articles/innovationmeans.html>

Powerful momentum

<sup>xxxiii</sup> See Peter F. Drucker, *Post-Capitalist Society*, HarperCollinsPublishers, 1994

<sup>xxxiv</sup> <http://www.un.org/esa/dsd/agenda21/>

<sup>xxxv</sup> See for instance <http://www.stiglitz-sen-fitoussi.fr/en/index.htm>

<sup>xxxvi</sup> See for instance [https://microsite.accenture.com/sustainability/Documents/Accenture\\_UNGC\\_Study\\_2010.pdf](https://microsite.accenture.com/sustainability/Documents/Accenture_UNGC_Study_2010.pdf)

<sup>xxxvii</sup> See for instance the IUCN. Bill Adams & Sally Jeanrenaud: *Transition to Sustainability*, IUCN, 2008 <http://www.iucn.org/index.cfm?uNewsID=1511>

<sup>xxxviii</sup> See for instance <http://www.greeneconomycoalition.org/node/76>

<sup>xxxix</sup> See for instance <http://www.transition-network.org/>

<sup>xl</sup> See also Josephine Green, *Democratizing*

*the Future*, 2007 <http://www.design.philips.com/shared/assets/Downloadablefile/democratizing-the-future-14324.pdf>

A chasm to cross

<sup>xli</sup> World Economic Forum (WEF), *Sustainability for Tomorrow's Consumer, The Business Case for Sustainability*, 2009, Executive Summary, page 6

Available at: <http://www.weforum.org/reports-results?fq=report%5Eissues%3A%22Sustainable%20Consumption%22>

<sup>xlii</sup> WEF, *Redesigning Business Value: A Roadmap for Sustainable Consumption*, 2010, Introduction and background, page 5

Available at: [http://www3.weforum.org/docs/WEF\\_RedesigningBusinessValue\\_SustainableConsumption\\_Report\\_2010.pdf](http://www3.weforum.org/docs/WEF_RedesigningBusinessValue_SustainableConsumption_Report_2010.pdf)

<sup>xliii</sup> <http://www.culturalcreatives.org/>

<sup>xliv</sup> WBCSD, *Facts and Trends, Sustainable Consumption*, 2008

Available at: [http://www.wbcds.org/DocRoot/19Xwh-v7X5V8cDIHbHC3G/WBCSD\\_Sustainable\\_Consumption\\_web.pdf](http://www.wbcds.org/DocRoot/19Xwh-v7X5V8cDIHbHC3G/WBCSD_Sustainable_Consumption_web.pdf)

See also *I will if you will, Towards Sustainable Consumption*, Sustainable Consumption Roundtable, UK, 2006

<sup>xlv</sup> Geoffrey A. Moore, *Crossing the Chasm*, Harper Business Essentials, 1991

Reframing innovation

<sup>xlvi</sup> See *Guide to the Framework for Strategic Sustainable Development*, Blekinge Institute of Technology, 2008

<sup>xlvii</sup> See Karl-Henrik Robert, *Rationale for a Framework for Strategic Sustainable Development*

<sup>xlviii</sup> See *The Natural Step, Sustainability Primer*

Available at: <http://www.thenaturalstep.org/en/toolkits-around-world>

<sup>xlix</sup> See also: Henrik Ny, Jamie P. MacDonald, Göran Broman, Ryoichi Yamamoto, and Karl-Henrik Robert: *Sustainability Constraints as System Boundaries, An Approach to Making Life-Cycle Management Strategic*, Journal of Industrial Ecology, Vol. 10, Number 1-2, 2006

<sup>l</sup> See also: Sophie Byggeth, Göran Broman, Karl-Henrik Robert *A method for sustainable product development based on a modular system of guiding questions*. Journal for Cleaner Production, 2007

<sup>li</sup> Ray Anderson, Founder and Chairman, InterfaceFLOR, speech Portland USA, October 2007; See also Ray C. Anderson, *Confessions of a Radical Industrialist*, St Martin's Press, 2009

Social innovation

<sup>lii</sup> <http://www.5qualconference.eu/FCkeditor/userfiles/file/report.pdf>

<sup>liii</sup> Josephine Green, *Democratizing the Future*, Philips Design, 2007 <http://www.design.philips.com/shared/assets/Downloadablefile/democratizing-the-future-14324.pdf>

<sup>liv</sup> See [socialinnovationexchange.org](http://socialinnovationexchange.org). More information can be found in the MBA thesis of A. Jeuken on *Social Innovation for Sustainable Development*, TiasNimbas Business School, the Netherlands, 2010

<sup>lv</sup> See Murray, Caulier-Grice and Mulgan, *The Open Book of Social Innovation*, 2010, page 3

Available at: [http://www.nesta.org.uk/publications/assets/features/the\\_open\\_book\\_of\\_social\\_](http://www.nesta.org.uk/publications/assets/features/the_open_book_of_social_)

innovation

<sup>lvi</sup> See [http://www.jimcollins.com/article\\_topics/articles/the-most-creative.html](http://www.jimcollins.com/article_topics/articles/the-most-creative.html) and also James C. Collins & Jerry I. Porras, *Built to Last*, Harper Business, 1997

Collaboration

<sup>lvii</sup> See <http://greeneconomycoalition.org/>

<sup>lviii</sup> See <http://www.c40cities.org/>

<sup>lix</sup> <http://www.transitionnetwork.org/>

<sup>lx</sup> See <http://www.doctorswithoutborders.org/>; [www.wiserearth.org](http://www.wiserearth.org)

## Part III

Where Philips comes from

<sup>lxi</sup> See *Accenture CEO Study*, 2010, page 27

<sup>lxii</sup> D.H. Meadows, D.L. Meadows, J. Randers, and W.W. Behrens III.: *The Limits to Growth*, 1972

Where the company is now

<sup>lxiii</sup> See [http://www.annualreport2010.philips.com/content\\_ar-2010/proofpoints/supplier\\_sustainability.asp](http://www.annualreport2010.philips.com/content_ar-2010/proofpoints/supplier_sustainability.asp)

<sup>lxiv</sup> More background information to be found at: <http://www.philips.com/about/company/missionandvisionvaluesandstrategy/vision2015.page>

<sup>lxv</sup> More information to be found at: <http://www.philips.com/about/sustainability/index.page>

<sup>lxvi</sup> See [http://www.annualreport2010.philips.com/content\\_ar-2010/proofpoints/improve\\_footprint.asp](http://www.annualreport2010.philips.com/content_ar-2010/proofpoints/improve_footprint.asp)

<sup>lxvii</sup> See Philips Research Areas and Topics, December 2010

Where it might go

<sup>lxviii</sup> See <http://www.footprintnetwork.org>

<sup>LXXIX</sup> See for example, Exploring Sustainable Development, 1997 <http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=Mjkkx>

<sup>LXX</sup> Back-casting is also an integral part of The Natural Step's Framework for Strategic Sustainable Development (FSSD). See Part II, Understanding sustainable innovation, page 28 for more details on the FSSD.

## Part IV

### Build relationships towards a higher purpose

<sup>LXXI</sup> See for instance <http://www.businessballs.com/tuckmanformingstormingnormingperforming.htm>;

[http://en.wikipedia.org/wiki/Tuckman's\\_stages\\_of\\_group\\_development](http://en.wikipedia.org/wiki/Tuckman's_stages_of_group_development)

<sup>LXXII</sup> See for instance David Bohm, *On Dialogue*, Routledge, 2004; [http://en.wikipedia.org/wiki/Bohm\\_Dialogue](http://en.wikipedia.org/wiki/Bohm_Dialogue); <http://www.david-bohm.net/dialogue/>

<sup>LXXIII</sup> See for instance *Life's Principles* developed by the Biomimicry Institute <http://www.biomimicryinstitute.org/about-us/biomimicry-a-tool-for-innovation.html>

<sup>LXXIV</sup> See for instance: [www.kiva.org](http://www.kiva.org), [www.grameen-info.org](http://www.grameen-info.org)

<sup>LXXV</sup> See for instance [http://www.wiserearth.org/The\\_Social\\_Network\\_for\\_Sustainability](http://www.wiserearth.org/The_Social_Network_for_Sustainability)

<sup>LXXVI</sup> See [http://www.newscenter.philips.com/main/standard/about/news/press/20090630\\_project\\_hope.wpd](http://www.newscenter.philips.com/main/standard/about/news/press/20090630_project_hope.wpd)

<sup>LXXVII</sup> See [http://www.design.philips.com/about/design/designportfolio/design\\_futures/design\\_probes/index.page](http://www.design.philips.com/about/design/designportfolio/design_futures/design_probes/index.page)

<sup>LXXVIII</sup> See <http://netforum.healthcare.philips.com/global>

[com/global](http://netforum.healthcare.philips.com/global)

<sup>LXXIX</sup> This is also recognized in the new EFQM model 2010, see e.g. EFQM Excellence Model, 2009, ISBN: 978-90-5236-501-5

<sup>LXXX</sup> See for instance: <http://www.eirma.org/f3/showthread.php?t=734>

<sup>LXXXI</sup> See <http://www.responsible-partnering.org/library/handbook-11.pdf> last visited on March 4, 2011

<sup>LXXXII</sup> For more on Philips sustainability reporting see: [http://www.annualreport2010.philips.com/content\\_ar-2010/sustainability\\_statements.asp?link\\_origin=global\\_en\\_ar2010\\_top](http://www.annualreport2010.philips.com/content_ar-2010/sustainability_statements.asp?link_origin=global_en_ar2010_top)

### Enable sustainable lifestyles

<sup>LXXXIII</sup> See for instance: WBCSD, *Sustainable Consumption Facts and Trends, 2008; I will if you will, Towards Sustainable Consumption*, Sustainable Consumption Roundtable, UK, 2006; WEF, *Sustainability for Tomorrow's Consumer, The Business Case for Sustainability*, 2009; WEF, *Redesigning Business Value*, 2010

<sup>LXXXIV</sup> See WEF, *Redesigning Business Value*, 2010, page 16

<sup>LXXXV</sup> See WEF, *Redesigning Business Value*, 2010, page 15 & 21ff

<sup>LXXXVI</sup> See [http://www.annualreport2010.philips.com/content\\_ar-2010/proofpoints/simply\\_healthy\\_at\\_schools.asp](http://www.annualreport2010.philips.com/content_ar-2010/proofpoints/simply_healthy_at_schools.asp)

<sup>LXXXVII</sup> See for instance: WBCSD, *Sustainable Consumption Facts and Trends, 2008; I will if you will, Towards Sustainable Consumption*, Sustainable Consumption Roundtable, UK, 2006; WEF, *Sustainability for Tomorrow's Consumer, The Business Case for*

*Sustainability, 2009*; WEF, *Redesigning Business Value*, 2010

### Create multi-stakeholder value

<sup>LXXXVIII</sup> See for instance: <http://people.stfx.ca/rmespi/Lars/BibliographycheckifitisinBIB-TEXJUNE2005/Lawn2003.pdf>; <http://www.max-neef.cl/home.php>;

<sup>LXXXIX</sup> See e.g. <http://en.wikipedia.org/wiki/Charrette>

<sup>XC</sup> See [http://www.klimaatmagazine.nl/KM6/Rijnenburg\\_KM6.pdf](http://www.klimaatmagazine.nl/KM6/Rijnenburg_KM6.pdf)

<sup>XCI</sup> See WBCSD: *Facts and Trends, Energy Efficiency in Buildings: Business Realities and Opportunities*, 2008; *Energy Efficiency in Buildings: Transforming the Market*, 2009

Available at:

[http://www.wbcsd.org/DocRoot/JNHhGVc-WoRIIP4p2NaKI/WBCSD\\_EEB\\_final.pdf](http://www.wbcsd.org/DocRoot/JNHhGVc-WoRIIP4p2NaKI/WBCSD_EEB_final.pdf);

<http://www.wbcsd.org/Plugins/DocSearch/details.asp?DocTypeId=25&ObjectId=MzQyMDQ>

<sup>XCI</sup> See <http://iris.thegiin.org/>

<sup>XCIII</sup> See [http://www.newscenter.philips.com/main/standard/news/press/2011/20110228\\_itw\\_collaboration.wpd](http://www.newscenter.philips.com/main/standard/news/press/2011/20110228_itw_collaboration.wpd)

### Use resources responsibly

<sup>XCIV</sup> See Braungart & McDonough, *Cradle to cradle*, page 6, Vintage Books, 2009

<sup>XCv</sup> Henrik Ny, Jamie P. MacDonald, Göran Broman, Ryoichi Yamamoto, and Karl-Henrik Robèrt: *Sustainability Constraints as System Boundaries, An Approach to Making Life-Cycle Management Strategic*, Journal of Industrial Ecology, Vol. 10, Number 1-2, 2006

<sup>XCvi</sup> [www.naturalstep.org/en/sustainability-life-cycle-assessment-slca](http://www.naturalstep.org/en/sustainability-life-cycle-assessment-slca)