



Philips sustainability journey

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Embedding Sustainability as Innovation Driver at Philips

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1. Introduction

Business faces increasing pressure to change. While previously it was possible for business to perceive themselves and to be perceived as separate from the rest of society, corporations now are increasingly singled out as a source of environmental and social harm. Consequently, next to serving their obvious purpose share holder value maximization, they are also being asked (and increasingly obliged through new laws and regulations), to attend to the environmental and social implications of their activity. All this is captured in the Triple Bottom Line (TBL), a notion introducing business accountability along the axes of three "P-factors": people, planet and profit. The triple-P concept was initially discussed in 1992 during the first Rio Conference, as a pathway to bring business to the sustainability table.

In future, firms will need to expand their understanding of sustainability beyond the financial axis to the triple-P approach if they want to retain legitimacy: their social license to operate.

Reflection question: What is the difference between traditional and 3-P-sustainability oriented business practice? Which implications will triple-P thinking have on innovation? What are the characteristics of truly Sustainability-Oriented-Innovation (SOI)?

Innovation management involves mostly steady state maintenance of a stable position: incremental innovation. Occasionally it's also about managing the radical, discontinuous shift to a new state. The long-standing challenge here is that capabilities for dealing with one are not the same as the other – the former is about maintenance whilst the latter is about firstly understanding the changing innovation context and the newly emerging innovation drivers and then entrepreneurial risk-taking and creation of new possibilities. How does a large established organization deal with this? Which specific challenges and opportunities emerge with sustainability as innovation driver?

The difficulty is striking a balance – maintaining the current business through operational improvements and traditional innovation whilst also allowing some measure of entrepreneurial freedom to some people to explore sustainability as new long-term innovation driver and understand the new opportunities that might come along with this. But how to manage the tensions between the two approaches?

Perhaps simple responses are some form of incubation, academic partnerships or consultancy support. But what if there's nobody around yet, who knows what to do, who has experienced the journey already? Then in a more tricky approach this work needs to be done from within the old organization – how to renew from within?

This was the challenge facing Philips in 2006 – how to embed sustainability as innovation driver?

Reflection question: This involved the company in some significant reflection around defining 'sustainability' and building a strategy towards delivering this. What was the essence of sustainability driving innovation? Was it about innovation for the poor? Was it about further strengthening environmental consciousness? How would it be possible to handle the tension between short-term profitability increase – strongly demanded by the stock markets – and long-term system innovation generating

value for multiple stakeholders? Where and how to move forward – how to make a radical leap into the future?

This wasn't just a matter of finding new ideas but getting acceptance for them, building a new vision of what the company could be – and then implementing it. In other words the challenge was nothing less than one of how to change the corporate mind.

2. A framework for thinking about sustainability and innovation

In the year 2012 the Canadian Network for Business Sustainability (NBS) commissioned some research to explore the question: What innovation activities do firms engage in to become sustainable?² Based on a review of reported experiences in this area a framework model was developed to help position different kinds of activity in the sustainability-oriented innovation space – see figure 1.³

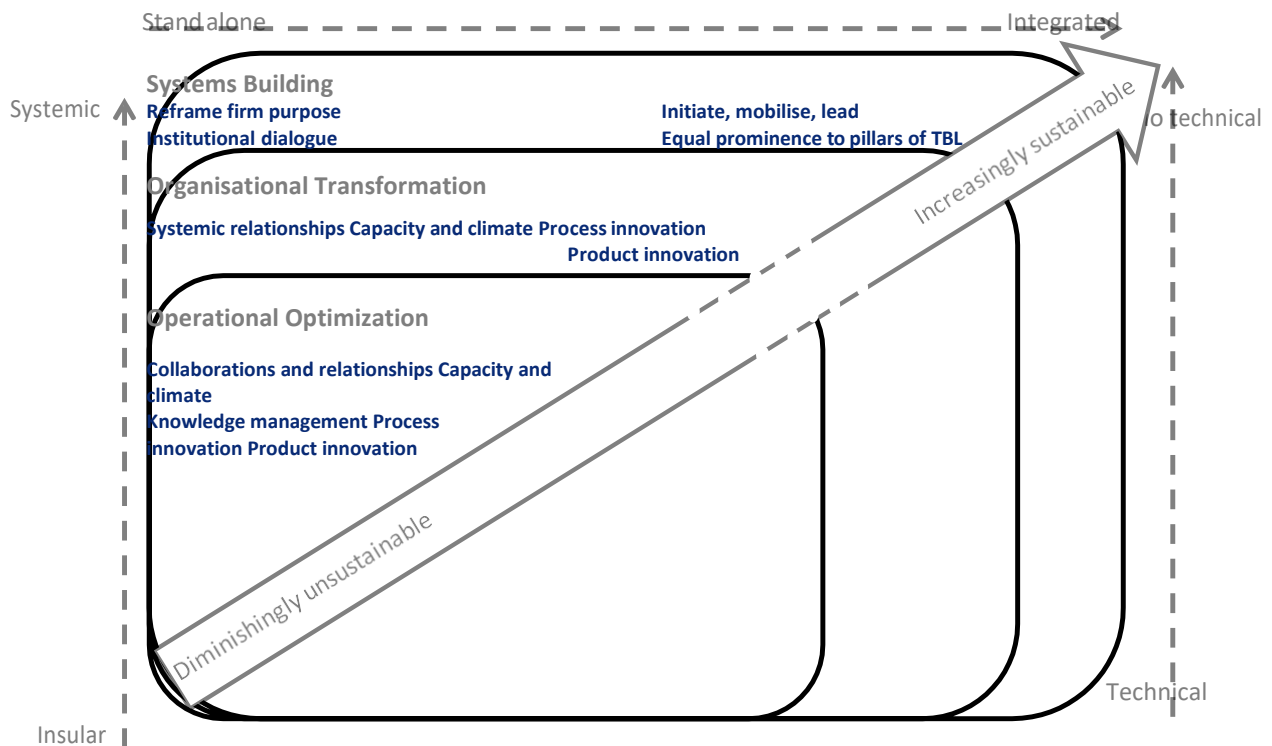


Figure 1: SOI framework

Three axes are used to introduce starting points for innovation and change:

- The innovation focus: from a narrow technological focus towards a more people-focused (socio technical) approach

² Richard Adams et al.: Innovating for Sustainability, A Systemic Review of the Body of Knowledge, 2012

³ The report reviewed 127 sources covering the period 1997-2012 and is available from NBS website which also has multiple other resources dealing with this question. <http://nbs.net/knowledge/strategy/innovation/executive-report/> A copy is also available on the Portal – click here to access it.

- Firm's self-view in relation to society: from "insular" (focused on itself) towards "systemic" (perceiving itself as part of a bigger organizational "eco-system")
- Responsibility for innovation: from innovation in stand-alone form (where a single unit / department holds full responsibility) towards integrated (where it is embedded in the wider organization or system and where perspectives from multiple stakeholders are brought together)

Within this "innovation space" firms implement it is possible to map three different types of sustainability oriented innovation activities:

- Operational Optimization: is characterized by the approach *Eco-Efficiency*. Its innovation objective is compliance and efficiency or in other words it's about *doing the same things better*. Innovations here tend to be incremental improvements in the direction of reducing harm.
- Organizational Transformation: is characterized by the approach of creating *New Market Opportunities*. Its innovation objective is to create novel products, services or business models --- in other words it's about *doing good by doing new things*. It creates shared value for multiple stakeholders and requires new business processes next to the establishment of systemic relationships to multiple stakeholders. Innovations here tend to be more radical in nature and organizations often adopt more open approaches in their development. (A variety of labels have emerged around this kind of activity including frugal innovation, resource-constrained innovation, reverse innovation, jugaad innovation.)
- Systems Building: is about the conscious creation of *Societal Change*. Its innovation objective is about creating novel products, services or business models that are impossible to achieve alone --- in other words it's about *doing good by doing new things with others*. The expected outcome is net positive impact. It requires a fundamental shift in the firm's purpose and extends beyond the firm to drive institutional change. Innovations here are radical in nature, beyond open even engaging and involve high levels of complexity and uncertainty. In this context new approaches as *environmental* and *social enterprises*, *co-creation*, *eco-system innovation*, *closed loop* or *circular economy* are emerging.

In the case study which follows describing the Philips Journey of Sustainable Innovation we will use this framework, trying to map key events and activities. In a series of complementary cases (also available on the Portal) we will explore the "how" of innovation management around these key stages in the framework model.

3. Royal Philips NV --- background

Royal Philips NV (Philips) is a global corporation and an internationally recognized brand name. It is a diversified health and well-being company, focused on improving people's lives through meaningful innovation in the areas of Healthcare, Consumer Lifestyle and Lighting. Headquartered in the Netherlands, Philips posted 2012 sales of EUR 24.8 billion with an EBITA of 6.1%. Approximately 118,000 employees realize the Philips' sales and services in more than 100 countries.

Philips is one of a relatively small band of firms which have survived longer than a century - the original company was set up in 1891 by Anton and Gerard Philips as Philips Gloeilampen Fabrieken N.V - and the Eindhoven factory they built began producing light bulbs (see <http://www.research.philips.com/successes/history.html> for a brief video background, <http://www.philips.com/about/>) for the company's history.

Since the very beginning the company's mission has stayed the same. It's about:
Improving people's lives through meaningful innovation.

Philips innovation legacy⁴

Philips' legacy of innovation 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.



Figure 2: strong Sustainability & Innovation track record, source: www.verhalenvanvroeger.nl

⁴ The paragraphs on Philips sustainability legacy and Philips innovation legacy are taken from: Dorothea Seebode: Sustainable Innovation, 2011 Internal documents)

Like many other long-lived corporations Philips has adjusted its innovation approach several times, anticipating major changes in society. In recent decades this has 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 100 non-Philips business entities. During the last decade, its focus was "inside-out" based on teaming up, incubation and spin-outs. The next step will be to increase the "outside-in" effectiveness in co-creating sustainable systems solutions.

Philips legacy in sustainability

Putting people at the center of their business activities, Philips' founding fathers embedded sustainability at the heart of their company since its earliest days. Already early in the 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" dialogue and in 1971 the first corporate environmental function was established. Initially this function created transparency on how Philips complied with environmental laws and health & safety regulations.

Later, in 2003, a structured sustainable supply chain program was also introduced. Philips' EcoVision programs were first launched in 1998, setting corporate sustainability-related targets. The first green innovation targets were introduced in 2007 in EcoVision4. In 2003, the Philips Environmental Report (first published in 1999) was extended into a Sustainability Report and in 2009 this was integrated into the Philips Annual Report carrying its financial, social and environmental performance. This signaled the full embedding of sustainability in Philips' business practices. Philips' involvement in the World Business Council for Sustainable Development (WBCSD) dates back to 1992, when the Council was set up in the wake of the first Rio Earth Summit.

Philips 2012 – sustainability at the heart of its strategy

Since 2012 Philips is organised in three main business sectors: Healthcare, Consumer Lifestyle and Lighting and Innovation Group & Services. The Corporate Sustainability Office (CSO) orchestrates and monitors all Philips sustainability programs and directly reports into the Executive Committee.

In 2012 Philips launched their strengthened VISION:

*At Philips, we strive to **make the world healthier and more sustainable** through innovation. Our goal is **to improve the lives of 3 billion people a year by 2025**. We will be the best place to work for people who share our passion. Together we will deliver superior value for our customers and shareholders.⁵*

⁵ Source: <http://www.philips.com/about/company/missionandvisionvaluesandstrategy/index.page>

In more detail this is worked out as follows⁶:

Our EcoVision Commitments

In 2050 there will be 9 billion people living on Earth. Sustainable development for us means enabling all mankind to live healthy and well within the ecological carrying capacity of our planet.

Philips has a long sustainability history stretching all the way back to our founding fathers. In 1994 we launched our first program and set sustainability targets for our own operations. In 1998, we launched our first EcoVision program focused on operations and products. We also started to focus on sustainability in our supply chain in 2003. In 2010 we extended our scope further by including the social dimension of products and solutions, which is now reflected in our renewed company vision stating that we strive to make the world healthier and more sustainable through innovation. Our goal is to improve the lives of 3 billion people a year by 2025.

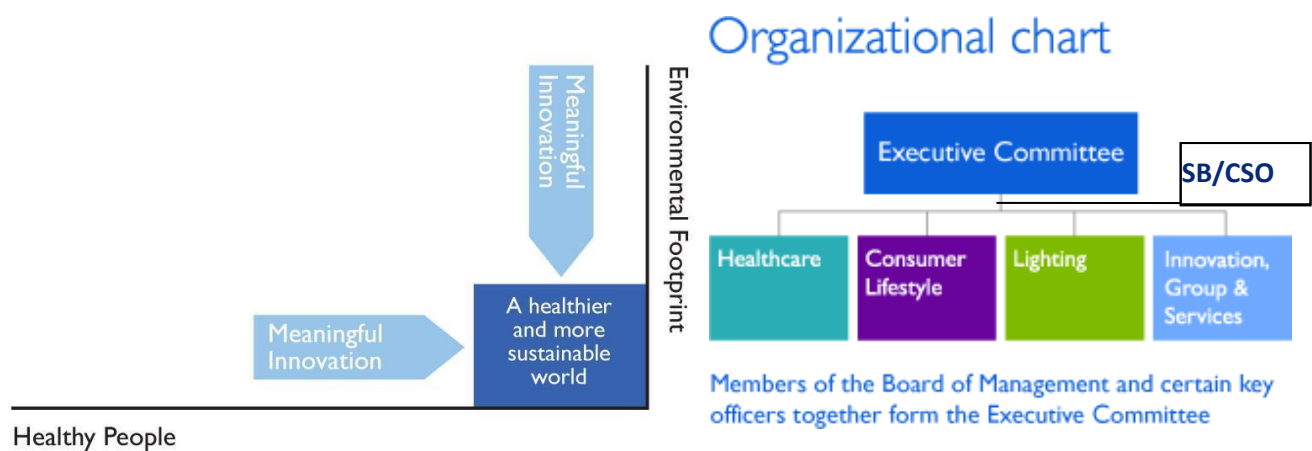


Figure 3: Philips' "lives improved dimensions" and high level Organisational chart (incl. CSO)

To guide our efforts and measure our progress, we take a two-dimensional approach – social and ecological – to improving people's lives. Products and solutions from our portfolio that directly support the curative (care) or preventive (well-being) side of people's health, determine the contribution to the social dimension. As healthy ecosystems are also needed for people to live a healthy life, the contribution to the ecological dimension is determined by means of our Green product portfolio, which is focused on improving energy and resource efficiency.

We have identified three key innovation areas where we can bring our competencies to bear, 'care', 'energy efficiency' and 'materials':

- *Improving people's lives: 2015 Target: 2 billion lives a year by 2015. 3 billion lives by 2025.*
- *Improving energy efficiency of Philips products. 2015 Target: 50% improvement for the average total product portfolio compared to 2009*
- *Closing the materials loop. 2015 Targets: Double global collection, recycling amounts and recycled materials in products compared to 2009.*

⁶ Source: <http://www.philips.com/about/sustainability/ecovision/index.page>

Each of our three sectors -- Healthcare, Consumer Lifestyle and Lighting -- is in the lead on one of the leadership key performance indicators with Healthcare leading "care", Lighting "energy efficiency" and Consumer Lifestyle "materials".

The current EcoVision program is a main driver to realize our company's vision. The main elements of the program are: Green Product sales, Improving people's lives, Green Innovation, Green Operations, Health & Safety, Employee Engagement, Supplier Sustainability

The Sustainability Board (SB) is the highest governing sustainability body in Philips, chaired by the head of Group Innovation and Strategy, thus a member of the Executive Committee. Three other Executive Committee members sit in the SB jointly with sector and functional executives. The SB convenes four times per year, defines Philips' sustainability strategy and programs, monitors progress and takes corrective action where needed.

These are impressive but ambitious aims expressing a serious commitment to sustainability-oriented innovation. They build on significant achievements in this space but also map out a future challenging direction of travel – and they also raise some important questions which we will explore in the next section. Why and how did this happen? What were the steps that were taken?

4. Philips Sustainable Innovation Journey

In this section, the Philips Sustainable Innovation journey is introduced in a brief overview of development stages as captured in the timeline below.



Figure 4: Timeline of Philips Journey towards Sustainable Innovation

4.1 Before the journey started

As the table below indicates there were significant concerns being expressed across the global business community about sustainability issues since the early 1970s. Philips had already engaged actively in this conversation and taken a number of important steps to meet the challenge.

<i>The external picture ..</i>	<i>Philips activities - ..</i>
<ul style="list-style-type: none"> 1972: <u>the</u> Club of Rome published "<i>The limits of growth</i>" 1987: the Brundtland commission defines "<i>sustainable development</i>" as "<i>meeting the needs of current generations without compromising the ability of future generations to meet their <u>needs</u></i>" 1992: first Rio-conference around sustainability and, with the "<i>triple P: planet, people, profit - notion</i>", business is invited to take co-responsibility for sustainable <u>development</u> 2000: launch of the "<i>UN-Millennium Development Goals</i>" 	<ul style="list-style-type: none"> 1970: Philips participates in the Club of Rome workgroup on guidelines for environmental performance and in a follow up the first environmental function is established in <u>1971</u> 1987: Philips first global environmental policy 1993: Philips becomes a member of the World Business Council for Sustainable Development; the WBCSD was initiated as response of the business community to the 1st Rio conference in 1992. (see also http://www.wbcsd.org/about/history.aspx) 1998: launch of first corporate four-year <u>EcoVision program</u> Since 2002: first "<i>solution for the poor</i>" experiments in different parts of the Philips innovation community. Examples of product prototypes include woodstove, solar powered water purification, off-grid <u>lighting</u>

In different innovation related organisational units, especially Philips Research, Philips Design, Corporate Strategy, Lighting and Healthcare, employees used the freedom, the Philips culture

provided to their staff to suggest an increasing engagement of the company in sustainability related topics like: renewable energy, water purification, low cost healthcare solutions. Listening to these ideas and observing the global economic climate the CTO of Philips who also was the head of Philips Research early in 2006 decided to establish a new role at Philips Research with the purpose to

Establish sustainability as innovation driver for Philips, starting at Philips Research.

However, what exactly was the assignment? What did sustainability mean at Philips and Philips Research in particular?

4.2: 2006 -- STONES & clarifying the definition .

The year 2006 was the year that brought Climate Change (CC) on the global agenda .

<i>The external picture ..</i>	<i>Philips activities...</i>
<ul style="list-style-type: none"> • Al Gore's film 'An Inconvenient Truth' created broad public awareness for CC challenge <p>Nicholas Stern's report 'The Economics of Climate Change' created bridge between environmental / scientific and economic community</p>	<p>At a December 2006 "Green" Conference in Brussels, Philips Lighting Chief Executive Officer Theo van Deursen announced that Philips would start to eliminate incandescent lighting in Europe, where the switch over could happen within 10 years</p>

It became clear very quickly that the CTO of Philips had quite a broad perspective on sustainability as innovation driver, far beyond innovating for the poor. For him this was only one, maybe the most challenging angle. During one of the early scope conversations he posed the following question:

If we can't provide environmentally sound and socially relevant products and services here in Europe or in the US, where we know our customers, why should we be successful in markets we don't understand yet?

This meant, the new role was supposed to look into sustainability as innovation driver in its broadest sense: both from the environmental and social perspective and across all existing markets and beyond, thus globally. This very broad scope was finally expressed in the following role definition:

To introduce and maintain sustainability as innovation and business driver into the global Philips Research and Corporate Technology (CT) organization by developing a sustainability strategy and integrating sustainability in the Research programs and Research & CT processes.⁸

⁷ See Philips Sustainability Report, 2006, page 15

⁸ With a direct hierarchical reporting line to the CEO of Philips Research, and functional reporting lines to the CTO of Philips and the head of the Corporate Sustainability Office

A key part of the challenge was that there was no precedent for such a role in Philips and so there was no reference or model to learn from.

Reflection question: What does this mean for the change agent who leads it?⁹

The stone(s)

It was clear from the very beginning that this was a massive job: one that had a long-term scope, probably asking for some significant shifts in the innovation focus of the company. It would impact on decision-making about innovation directions, the design of the innovation process and the ways in which it monitored and measured innovation activity and progress. In other words it was an assignment to stimulate organisational transformation, though it was not explicitly expressed as such.

In May 2006 "sustainability" was the first agenda point of the Research Management Team (RMT) meeting. During this meeting the journey really started. It was deliberately designed holistically:

- In a first step the "birth of the new role" was acknowledged by handing out small stones with the words: RESPECT, COMMITMENT and DIALOG to the present "midwives" of the new role.
- Then the results of the current state analysis were shared and a work plan for the 2nd half of 2006 introduced.
- Finally an invitation was expressed to everybody to join the Sustainable Innovation Journey. To capture the nature of the challenge a large stone, representing the challenge, was used and participating managers were invited to try and move this big stone with inappropriate tools like screwdrivers, forks, spoons, and pens. This was meant to make them experience that the assignment was too big for a single person and to give a sense that they were on a journey into the unknown together

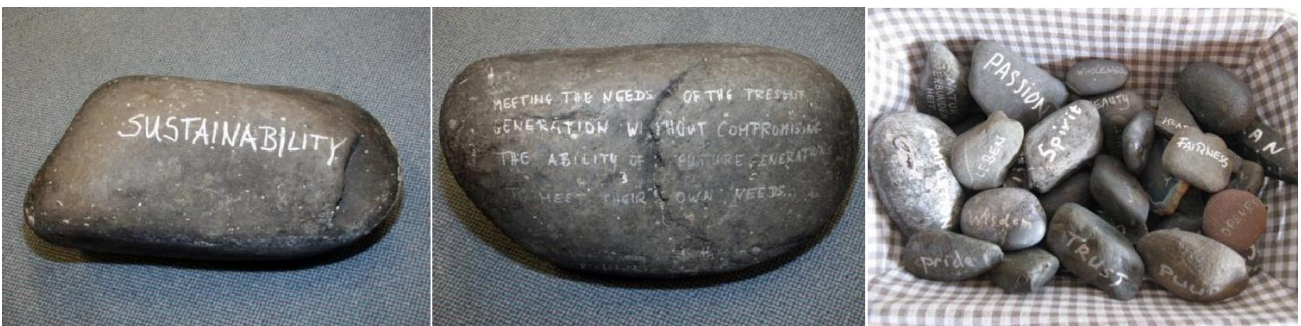


Figure 5: Photos of Sustainability Stone(s)

Finally every RMT member was invited to take an individual small stone with his/her personal contribution to the journey expressed in words like: BALANCE, FOCUS, TOGETHERNESS. The CTO of Philips, the big driver and "grey eminence" behind the journey received the ROOT-stone. Many hundred stones were handed out in the coming years, becoming a powerful tool for change.

⁹ The change agent had experiences in exploring and implementing a new innovation space, see: [Radical innovation in Philips Lighting](#)

Sensing the context

2006 was also the year of building a structured inventory of what was already there in terms of sustainability and innovation. Numerous mainly internal dialogs and multi-functional meetings led to key starting points:

1. It is all about a language shift: --- sustainability was mostly seen as equal to *green / environmental*, often linked to operational efficiency increases through decreased energy or material use. The social dimension was rarely on the radar; at best it was associated with *solutions for the poor*.
2. It is all about dealing with complexity and ambiguity: --- there were as many definitions of what sustainability meant for business as people one talked to. There was not a single "sustainability challenge". Instead it had many different expressions, was translated differently across different environments. This led to the recognition that there was unlikely to be one standardized solution.
3. It has a great deal to do with disruptive innovation especially around new business models: --- using sustainability 'glasses' - with both a social and an environmental lens --- towards innovation very quickly demands service business models, scope extensions into new geographic areas with limited market infrastructure, unknown user needs and usage behaviour etc. rather than incremental product improvement, traditional product diversification or line extension.
4. It is all about dealing with emotions and shifting perceptions: --- especially in the innovation community there was considerable scepticism about the honesty and seriousness with respect to innovating for sustainable development. The assumption that "*this is really all about 'green-washing'*" was widely expressed.

The Sustainability Value Framework¹⁰ (developed by Stuart Hart, a writer and researcher in the field) helped to map existing definitions and activities and clarify the scope of the new assignment. It also provided a powerful tool to help envisage the significant growth potential in terms of sustainability leadership and to temper the negative emotions around the topic.



Figure 6: Stuart Hart's Sustainable Value Framework

¹⁰ Stuart Hart, 'Capitalism at the crossroads', 2005 REF

Defining and aligning around a shared intention

In December 2006, a multi-disciplinary sustainability strategy workshop took place in the Research Lab in Aachen bringing together around 80 key decision makers and practitioners from all relevant Philips innovation and sustainability departments. All workshop participants – and through them the functions and departments they represented – acknowledged the Brundtland definitions of 1987¹¹:

Sustainability is defined as:

Meeting the needs of the present generation, without compromising the ability of future generations to meet their own needs.

(Brundlandt report, 1987)

Sustainable development – which is considered the path to Sustainability – is the *simultaneous pursuit of economic prosperity, environmental quality and social equity**. Companies that pursue this path are known as sustainable entrepreneurs.

(* equity: fairness, justice beyond law)

The workshop confirmed Philips' intention to align all new sustainable innovation efforts around the three Corporate Sustainability themes: healthcare (in emerging economies), energy, education & learning. At the end of the workshop all participants agreed that

- Seeing sustainability as innovation driver opens up new innovation space and business / growth opportunity, yet strategic action needs to be taken to get it done
- Both the innovation and the sustainability community in Philips need to work more closely together to make that happen.
- There was a growing sense of pride about Philips being serious about sustainability, since many existing sustainability related activities had not been visible to the innovation community before.

4.3: 2007 – Building the network

The year 2007 was the year in which global society responded to the Climate Change Challenge

<i>The external picture ..</i>	<i>Philips activities...</i>
<i>Growing awareness, for example through Live Earth 24 hour-concerts in 9 major cities of the world</i>	<i>First Philips Sustainable Innovation Day Launch of EcoVision 4 program with the aim that by 2012</i>
<i>Next to this first indications of the global economic crisis become visible – for example world stock markets plummet after China and Europe release less-than-expected growth reports.</i>	<i>-- 30% Green Product sales -- 1 Billion € investment in Green Innovation -- 25% increase of operational energy efficiency Launch of the "A Simple Switch" website; sponsoring of the Live Earth concerts Launch of Vision 2010</i>

¹¹ Explain and reference Brundland

Building the external network

A next step to become "strategic" was the first Sustainable Innovation Day in late spring 2007. Sixteen different sustainability stakeholders representing NGOs e.g. the Red Cross, Plan International, IUCN, Terre des Hommes, political institutions like the European Commission or the Dutch Ministry of Foreign Affairs, foundations like Light up The World or others like the Global Reporting Initiative (GRI), SAM (an organisation setting the standards for the Dow Jones Sustainability Index), KPMG and the WBCSD (World Business Council for Sustainable Development) visited the High Tech Campus in Eindhoven to share perspectives on innovation for sustainable development. The main discussion and the visits to carefully chosen prototypes focused on the two Philips sustainability themes: *energy* and *affordable healthcare for all*.

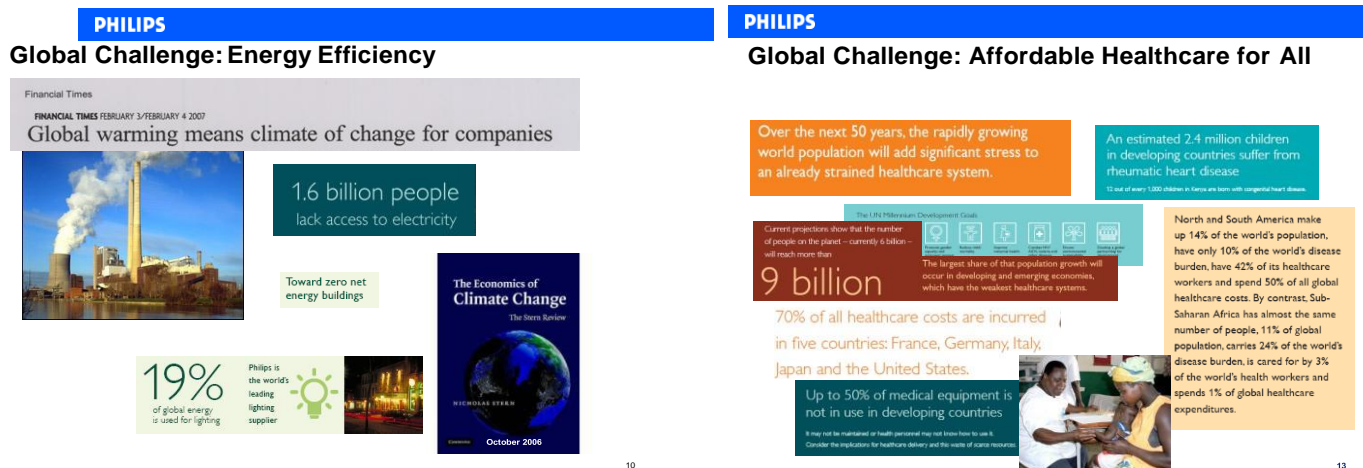


Figure 7: sheets of the opening to the 1st Sustainability Innovation Day, 2007

It was a surprise to learn, that organisations setting the reporting standards (like the GRI) and those selecting "best in industry" sustainable entrepreneurs (like SAM) had not yet thought about setting *leading* performance indicators stimulating corporations to invest in sustainability driven innovation. However, the thinking process around such an external "pull" effect was initiated on this event.

This meeting was followed by a series of regular innovation related meetings with external stakeholders where green or social innovation challenges were discussed. This was an important new direction for Philips where sustainability stakeholders were identified and initial contacts established.

Strengthening the internal network

In Philips several annual meetings were leveraged to build the bridge between the sustainability and the innovation community. Some multi-disciplinary innovation teams were further strengthened by sustainability experts. In the business sectors other functions like marketing, product and business development, and market research started to get involved in the sustainability activities. For example, Philips Lighting expanded its Sustainability Board by a development and a marketing representative and the CTO of Philips was invited to become a regular member. The Research Senior Director Sustainability became a member of the internal multi-functional, global expert network the Corporate Sustainability Office ran in order to effectively diffuse information, collect and align ideas next actions

and monitor implementation. Finally at Philips Research a sustainability 'champions' network was established. The role of the champions was to help translate "sustainability jargon" into "research language" before communicating it into the Research groups. Next to this they identified concrete examples of sustainable innovation thus anchoring the emerging strategy in realistic, where possible already identified and programmed innovation opportunities. For example, many healthcare projects were highly relevant in term of social sustainability, having the potential to help decrease the health-care system cost, thus meeting a social system challenge in almost all developed economies.

4.4: 2008 --- Developing a perspective

In September 2008 the bankruptcy of Lehmann Brothers was announced leading to a massive economic turmoil in the coming months...

<i>The external picture ..</i>	<i>Philips activities...</i>
<i>In the year 2008 US financial crises became broadly visible. A broad variety of media started to talk about "Casino-Capitalism"</i> <i>Olympics in Beijing</i> <i>New "green deal" → public, governmental funding to strengthen economy while at the same time inspiring the development towards a "green" economy</i> <i>IUCN-Conference in Barcelona: mental shift becomes visible → beyond is the root cause for all the trouble we have towards business needs to be part of the solution, business is by far the best in implementation.</i>	<ul style="list-style-type: none"> <i>Philips established a process (validated externally through the consultants KPMG) to measure "Green Innovation"</i> <i>Green Supply-Chain pilot executed</i> <i>Philips signs partnership contract with IUCN</i> <i>Green Lighting pilot at IUCN headquarter, at that time the most energy efficient building in the world.</i> <i>CEO of Philips Lighting appointed to be Chair of the Corporate Sustainability Board (marking an explicit shift from risk & reputation management to business & innovation)</i>

At Philips 2008 was characterized by clearly expressing the sustainable innovation challenge and suggesting the way forward. During the year both the internal and external network grew significantly.

The ice-breaker sheet

The first Sustainable Innovation Day had significantly increased the intention to embed sustainability deeply in innovation activities within Philips, and consequently there was a need for a clear and actionable sustainable innovation strategy and supporting corporate program. Although in September 2007 the EcoVision IV program had set (for the first time) a corporate target on Green Innovation, it was clear to the Sustainability Board members, that a broader perspective on sustainable innovation was required, one that went significantly beyond Energy and Climate Change – the focus of EcoVision IV – and which also explicitly embraced the social dimension.

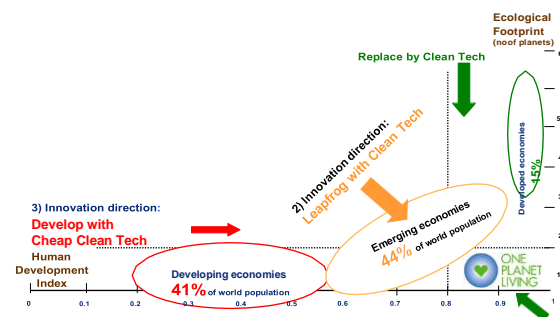
In parallel at Philips Research (especially in the champions group) intensive desk research was performed about global sustainability trends and related innovation opportunities. A deeper understanding of notions like: *green innovation* and *clean tech*, *social innovation* and *human well-being* was developed. The complexity of the findings quickly became overwhelming until an "ice-breaker" --- a simple framework picture which provided a common focus - was found in a diagram presented in the WWF Living Planet report 2006¹² was found. This became known as the "L-sheet" and it acted as a catalyst for much discussion.

WWF mapped each Nation's Human Development Index - a metric characterizing the development level of an average citizen via his life expectancy, education level and purchasing power --- against its environmental footprint¹³ - capturing the average resource consumption of renewable material and the local environment's capacity to reabsorb waste. This visual is a very powerful communication tool, as it offers a way to describe the global sustainability dilemma along both the environmental and social axis in just one sheet. And it makes clear that there is not the one solution that fits all, and that context relevance will be a key success factor.

Global Sustainability Innovation Directions Towards Sustainable Lifestyles

1) Innovation direction:

PHILIPS



Desired situation: high HDI & low ecological footprint
(www.oneplanetliving.org/10principles.html)
CONFIDENTIAL

Corporate Technologies & Philips Research_DS, August 13th 2007

7

Figure 8: WWF's 'L-sheet' & a snapshot of the sustainable innovation dialogue within Philips which makes use of it, 2007

During the second half of 2007 this sheet was extensively used to derive innovation priorities with different attention points for different global citizen groups.

In the internal Philips dialogue three main innovation directions were distinguished to innovate towards "one-planet living at a high HDI", the desired target area in the bottom right corner of the graph:

- *Replace by CleanTech*: enable choices towards sustainable lifestyles thus improving people's quality of life & maintaining HDI by reducing environmental footprint (aiming to replace unsustainable solutions by sustainable)

¹² You find the original graph on page 19 and can download the Living Planet Report via <https://www.footprintnetwork.org/.html>

¹³ The Environmental Footprint is a metric developed by the Global Footprint Network

- *Leapfrog with CleanTech*: enable sustainable lifestyle development and increase HDI by introducing low footprint solutions enabled by leapfrog technology (aiming to build with sustainable solutions)
- *Develop with cheap Clean Tech*: enable the increase of people's quality of life and HDI while maintaining ecological footprint, by "buying from the poor" (aiming to fight poverty by creating work thus enabling economic development and breaking the vicious poverty circle)

Developing an innovation framework for sustainable development

While more and more organisational units "bought into" the sustainability challenge and started to see it as innovation space and business opportunity, the demand for more specific guidance with respect to the three sustainability innovation directions derived from the L-sheet grew quickly. A deeper perspective was required and in a first step, a suggestion was created about how "One-Planet living" could be linked to Philips' ambition to provide meaningful innovation in the area of health and well-being. Figure 9 illustrates this.

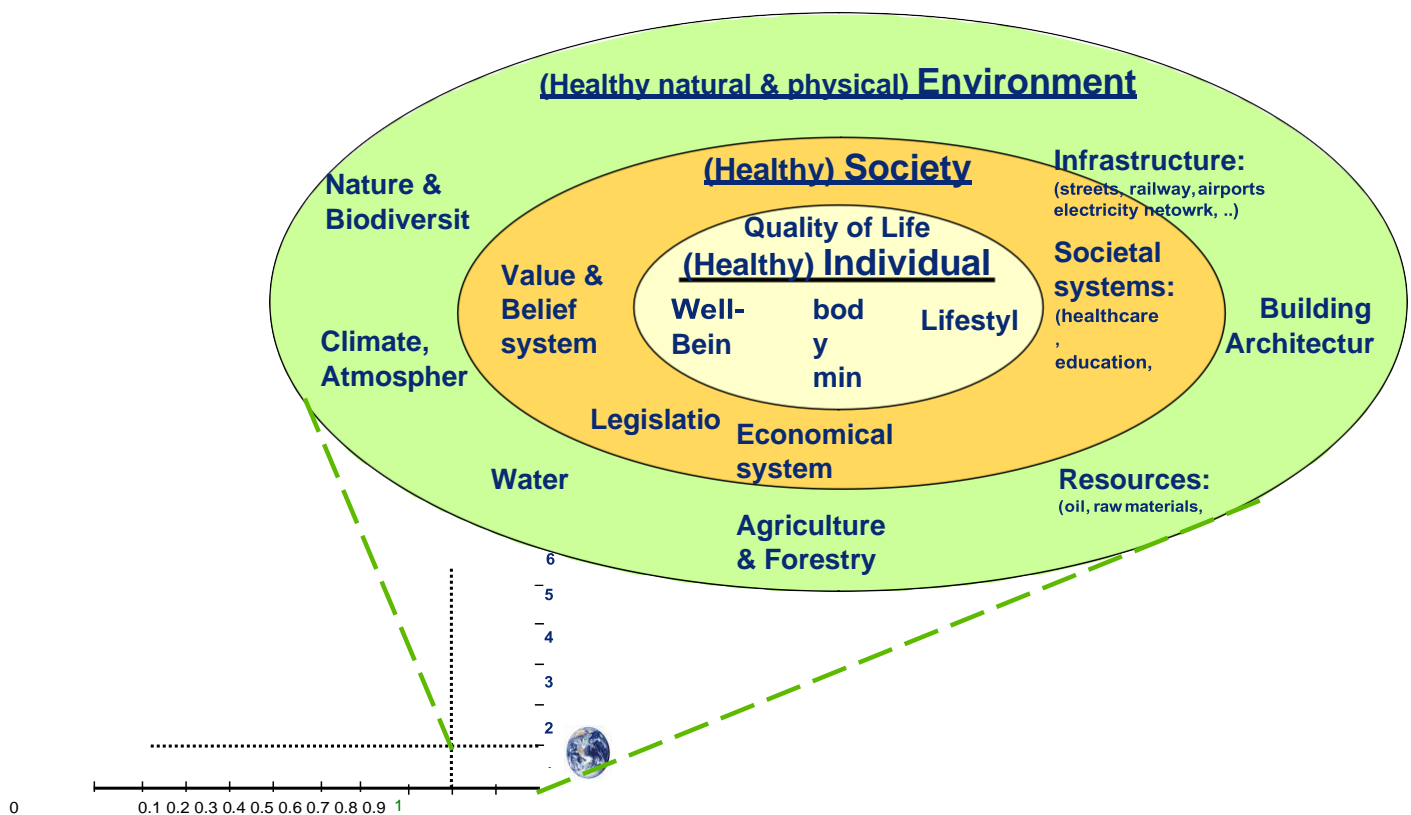


Figure 9: Possible opportunity framework for global Health & Well-being

Complementary to the visual the following definitions were derived building on a broad literature and desk research on health and well-being definitions especially in relation to sustainability:

- *Healthy Individual*: by a healthy body and mind being enabled to live well in dignity & freedom, maintain intact human relationships, be a responsible citizen, enjoys spare time, develops skills, ..

- *Healthy Society*: a people fairly sharing the load of proving to it's citizens a sustainable healthcare system, access to education, a reliable pension system, legislative and economical structure, etc. in the context of its specific values & belief systems, embracing the human rights, -
- *Healthy Environment*: a space orchestrated from physical, chemical and biological factors providing a healthy and pleasant living context --- both indoors and outdoors --- to individuals: access clean air and water, shelter, (energy efficient) light, safe food, -

In a second step an explicit project to "develop an Innovation Framework for Sustainable Development" was initiated. The team was composed of colleagues from Philips Design, the Corporate Sustainability Office, representatives of all business sectors and Research. Other relevant innovation and business planning departments were updated on a regular basis. After a few months the team consolidated its work in a framework, capturing the "playing field" or "future landscape" for sustainable development. (See figure 10). It builds up on two dimensions: the axis of "eco-system change" and the axis of "quality of influence". Finally the usefulness of the framework has been shown by mapping Lighting innovation on this framework and deriving new innovation priorities for the innovation space on both sides of the disruption border.

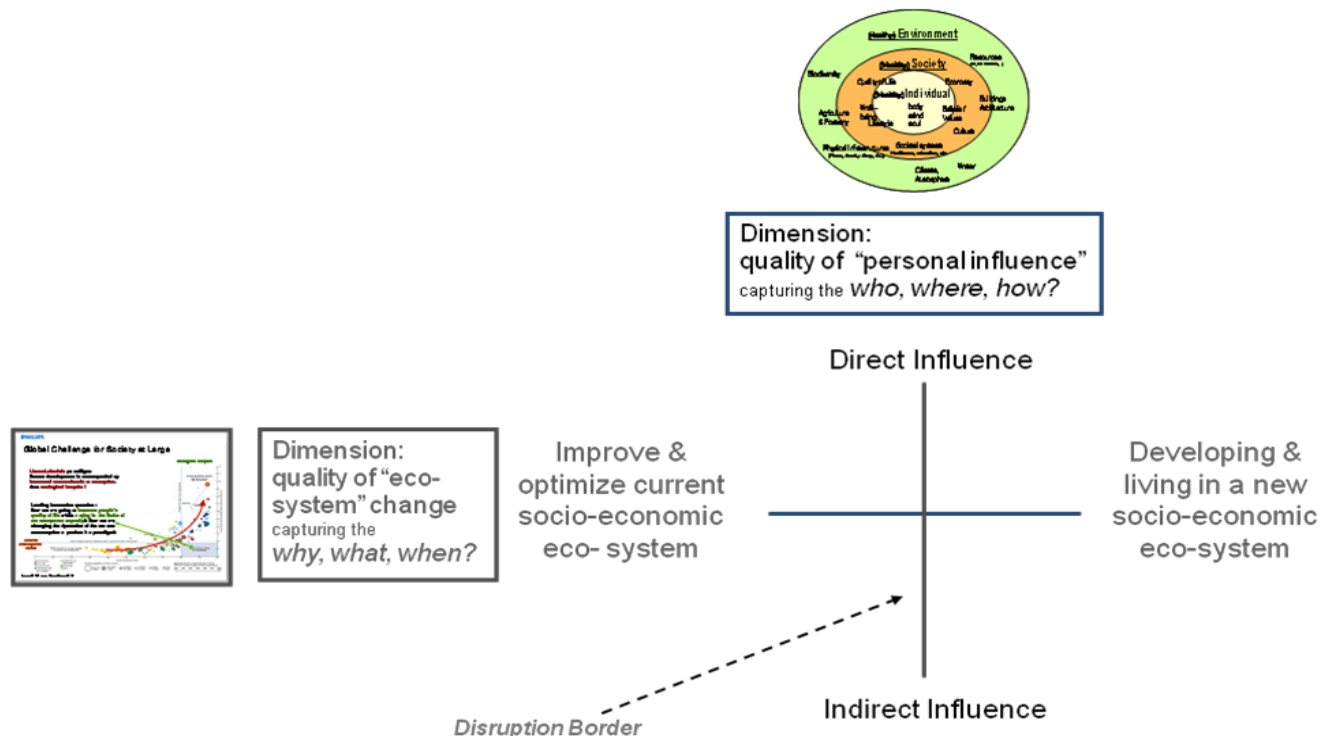


Figure 10: Innovation Framework for sustainable development

Two main questions remained: what is the "nature" of this disruption border? How can it be crossed?

Some organisational developments...

The second half of 2008 started with a few personnel and organisational changes: The chairman of the sustainability board left Philips.

Reflection question: Who should become the next chairman? Which manager holding which role would radiate the changing meaning of sustainability for the company, it's future directions and decision making?

Finally the CEO of Philips Lighting was chosen to take over this role, which gave the important signal to Philips employees that sustainability was now seen as important business driver (far beyond risk and reputation management). He also acknowledged the L-sheet, and had enthusiastically embraced it several months earlier in a New Business Creation board meeting he had chaired.

Next to this in the Corporate Sustainability Office team two new roles were created:

1. focusing on the coordination of the sustainability related business development and innovation programs and
2. strengthening the external stakeholder dialog to global policy making bodies and coordinate the operational excellence programs internally.

All Business Sectors were formally invited to establish their own multi-functional sustainability boards.

Reflection question: Were these organisational changes both in the Sustainability Office and the business sectors sensible to do? Why?

4.5: 2009 --- Deepening the understanding

The year 2009 was dominated by the global debate on the failure of capitalism and the Copenhagen Climate Conference

<i>The external picture ..</i>	<i>Philips activities...</i>
<ul style="list-style-type: none">• Obama became first black president of the US <p>Launch of Green Economy Coalition</p> <p>Copenhagen Climate Change Conference</p> <p>Tim Jackson's "Prosperity without Growth" is launched</p> <p>European year of creativity and innovation</p>	<ul style="list-style-type: none">• Philips launches it first integrated sustainability and annual report <p>Launch of first cradle to cradle inspired product (vacuum cleaner)</p> <p>Philips joins WBCSD Vision2050 project</p> <p>Major cost-efficiency activities streamlining the Philips innovation pipeline</p> <p>Launch of the "Philips Center for Health & Well-being"</p>

Philips is impacted by this and some tough business decisions were taken. At the same time the understanding of sustainability as innovation driver grew.

Disruptive times

2009 was the year in which Philips – like many other MNCs – witnessed the consequences of the global financial crises. In order to meet share-holder expectations in terms of profitability, another set of efficiency increasing activities was implemented. In addition the previously independent incubator organisation was integrated with the new business creation activities of the three business sectors.

The integration of the Aachen Research Lab into the Eindhoven Research Lab was announced. And in the business sectors tough decisions needed to be taken on the continuation of incremental innovation activities for quite a broad range of mature products. Under these conditions the question emerged as to how the appropriate level of attention for an important, yet not urgent topic like innovation for sustainable development could be maintained?

Contributing to the bigger movement

The World Business Council for Sustainable Development (WBCSD) had initiated the Vision 2050¹⁴ project mid 2008 rooting their long-term sustainability thinking in the WWF's "L-sheet". Philips joined the project early in 2009, largely because the corporation had drawn the same conclusions as the Vision 2050 team during their first workshop end 2008. For the remainder of the project Philips accepted leadership of the "health & well-being" work-stream in Vision 2050.

Pioneering new approaches

Although the overall climate in 2008 was essentially gloomy there were growing examples of promising approaches within the sustainable innovation arena. For example:

A) New innovation processes

In the Consumer Lifestyle (CL) division a multi-functional team of highly passionate innovators started to experiment with the *Cradle to Cradle* (C2C) ideas. Michael Braungart, one of the two authors of the Cradle to Cradle book¹⁵, gave an inspirational speech on the yearly innovation meeting in Amsterdam and in the follow-up a whole program was initiated to explore ways to use recycled material and design for upgradability. Strongly supported by the CL Sustainability Board member, who in his main role led a business unit, they explored the transition from product to service design, with its related logistical and business model consequences. Figure 11 gives some snapshots which capture the nature of this discussion.

The C2C pilot at Consumer Lifestyle progressed quickly and in 2009 finally resulted in the launch of the green Performer vacuum cleaner, a C2C-inspired product, in which for the first time a remarkable amount of second hand material was used. Next to this a materials "white list" of preferred materials was developed complementary to the "red list" of forbidden substances; an important step on the pathway from doing less bad towards "doing good".

¹⁴ The full report can be downloaded here <https://www.wbcd.org/Overview/About-us/Vision2050>

¹⁵ Find more information e.g. here <http://www.braungart.com/en/content/publications>

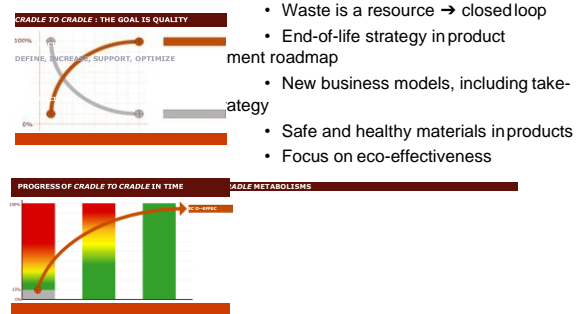
Cradle to Grave concept - current situation



CONFIDENTIAL

Consumer Lifestyle, Ton van Veen, May 15, 2008

Cradle to Cradle concept - potential situation



5 CONFIDENTIAL

Consumer Lifestyle, Ton van Veen, May 15, 2008

6

Figure 11: key Cradle to Cradle visuals

However, questions like how to organize take-back and how to generate value out of service business models were quickly emerging and started to fundamentally challenge implicit business assumptions.

At the same time at Philips Research the new innovation method *Biomimicry*¹⁶ was being explored through inviting a team of four students: an engineer, a designer, a biologist and a business person to write their final thesis on the design of an innovative nature-inspired business model for the "open lab" group, an organisational unit that had been set up to facilitate the spinning-out to and spinning-in innovations from the external market place. A set of six different "nature strategies" could be identified providing the open lab team with useful novel business model ideas.

B) New business model

Colleagues of the global Philips Lighting participated in a project called LUZ VERDE (green light) in Mexico. The idea for this project was that the large reduction in CO₂ emissions from millions of Mexican families switching to energy efficient bulbs can also translate into real money. As per the Kyoto Protocol each tonne of green house gas emissions reduced by projects in developing countries can be sold as an emission reduction "credit" to governments or companies in industrialised countries who can then use the credits to meet their CO₂ reduction obligations under the Protocol. The success lay in the new financing model: a Dutch alliance between Phillips supplying the energy efficient bulbs, Eneco trading the emission credits and ING providing the unique finance structure, brought the idea to fruition. During the pilot phase in 2009 1 million environmentally unfriendly, incandescent light bulbs were exchanged with energy efficient compact fluorescent light (CFLs) for free, with families in the Puebla region of Mexico. For 40% of these families, the annual savings on their energy bills amounts to the equivalent of a week's wages.

C) New innovation scope: System Building

Another pilot started with Philips Research participation. The city of Utrecht aimed to develop the most sustainable neighbourhood of the Netherlands in Rijnenburg. What, however, does most sustainable mean? A multi-stakeholder group of local authorities, construction and building

¹⁶ Nowadays information to be found via <http://biomimicry.net/>

companies, potential future inhabitants, banks etc. first defined in a charette¹⁷ process the boundary conditions for the development area. Then a multi-stakeholder team was established to detail the vision for Rijnenburg and develop actionable "system innovation specifications". Building on Philips Research's good experiences with the Experience Labs¹⁸ for understanding end user needs and usage preferences, a "Community Lab" was envisaged to understand emerging social needs and co-create future sustainable solutions and ownership or sharing models. More about this early system innovation project will be shared in a detailed case study on Systems Building.

D) New innovation events: Disruption and Connection Day

The Innovation Framework for Sustainable Development had opened two new questions. What is the "nature" of the disruption border? And how can it be crossed? These two questions were explored in the preparation for, and during two events: *Disruption Day* and *Connection Day*¹⁹. Both the names of these events and the event design had been chosen very carefully to manage expectations and communicate and embody the "newness & unfamiliarity of the topic".

Disruption Day took place in March 2009 at the High Tech Campus in Eindhoven. The event aim was to deploy broadly the *innovation framework for sustainable development* and increase the understanding of the nature of the disruption border. Five complementary speakers representing academia, the NGO world, policy setting and business shared their views on the radical innovation challenges and opportunities ahead and called for courageous action²⁰. Embracing the broad variety of exploration work of recent year specific business sector related disruptions were identified in multi-disciplinary workshops and during the Executive dinner via a serious game. The main conclusions of the day were:

- As one SB member phrased it: "*how blind can we be? In these times of economic instability and crises sustainability offers the only credible positive path out and employees love to work on it...*"
- The need to alter of concept from "border" to "zone", acknowledging, that the fundamental changes ahead would not be visible and viable for everybody at the same moment in time and different industries will have different change-over dynamics.
- Crossing the disruption zone is about asking fundamental questions about the purpose of business and innovation in the 21st century. This is a question that nobody can answer alone.

Connection Day was held in December 2009 the VanAbbe museum in Eindhoven. The Museum was chosen as location since its director had been exploring the question "what is the role of a museum in the 21st century?" with an exhibition series "Play van Abbe"²¹. This was the same type of fundamental identity question that also emerged during disruption day in terms of innovation for Philips.

The preparation of Connection day emerged to be a significant experiment in social innovation, bringing up unforeseen communication and culture clash challenges. These were mainly related to

¹⁷ A charette is a participatory dialog process that helps a diverse group of stakeholders to define a common goal

¹⁸ See <http://www.research.philips.com/focused/experiencelab.html>

²⁰ See e.g. <http://www.youtube.com/watch?v=Rz4zmSj63KI> , <http://www.youtube.com/watch?v=wAIY3eLiZhA> , <http://www.youtube.com/watch?v=7Ura-g7mVjk> , <http://www.youtube.com/watch?v=2Vc2T1P5QHW>

implicit expertise around "mental models & world views" and unconscious use of "organizational jargon". Surprisingly communication quickly became more effective when using "every-day language: as if you explain it to your 10 year old daughter." and metaphors. The common intention on both



Figure 12: impression of Connection Day in the Van Abbemuseum, 2009

sides to make this event a success liberated a lot of goodwill. Mutual trust grew very quickly in the preparation team. This was reflected in the actual event: many people who did not know each other connected and started to "imagine the world otherwise" daring to discuss fundamental life questions both on personal and professional levels. On a pragmatic side it was used to deploy the three emerging Sustainability KPIs: energy, materials, access to care and engage with the three enabling conditions: redefinition of value creation, transitions, co-creation. (See figure 12)

4.6: 2010 --- Shaping the opportunity

<i>The external picture ..</i>	<i>Philips activities...</i>
<i>The year 2010 was the year of Publishing of WBCSD Vision 2050 document</i>	<i>Sustainability on Philips Management Agenda</i>
<i>Iceland volcano eruptions stopped flight traffic across Atlantic & Europe for several days with the result that the global economy was slowed down for a few days</i>	<i>Philips' first Cairo to Cape Town road show tour²²</i>
	<i>EcoVision 5 sets first social sustainability target</i>
	<i>Vision 2015: leading in sustainability</i>

In February with the launch of the 2nd integrated financial, social and environmental Annual Report for the first time in Philips history sustainability as strategic driver was made an explicit top priority on the corporate management agenda. On the same day, the EcoVision 5 program was launched and with it a corporate social sustainability business target. Significantly the EcoVision 4 program originally had a time reach into 2012, but both the Green Products and the Green Innovation targets had already been realized, far more quickly than expected. (See figure 13).

²² See also <http://www.youtube.com/watch?v=gAWjY1oulvs>

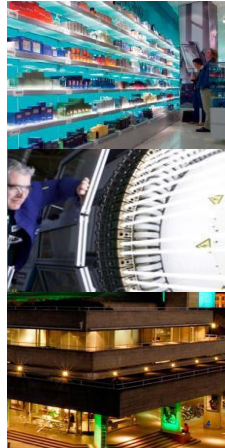
PHILIPS

EcoVision4 Targets for 2012

Double total **revenues** from
Green Products to 30%

Double **investment** in Green
Innovations to EUR 1 billion cumulative

Improve our **operational energy efficiency**
by 25% and reduce **CO₂** emissions by
25%



PHILIPS

Reaching EcoVision5: Ambitious new targets

5:
bring care to more than 500 million people

improve the **energy efficiency** of our
portfolio by 50%

double the **global collection and recycling**
of our products, as well as double the
of **recycled materials** in our products

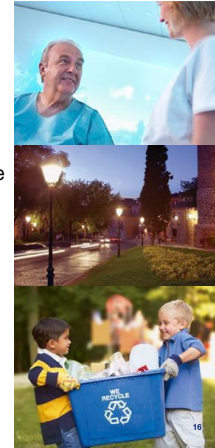


Figure 13: EcoVision4 and EcoVision5 targets

Vision 2050 introduces the "big dream"

At the same time in Switzerland the World Business Council for Sustainable Development launched the Vision2050 report. This was helpful timing, since it was – as the Philips approach – rooted in the L-sheet. During the preceding 18 months 29 multinational corporations had jointly developed this shared vision for 2050:

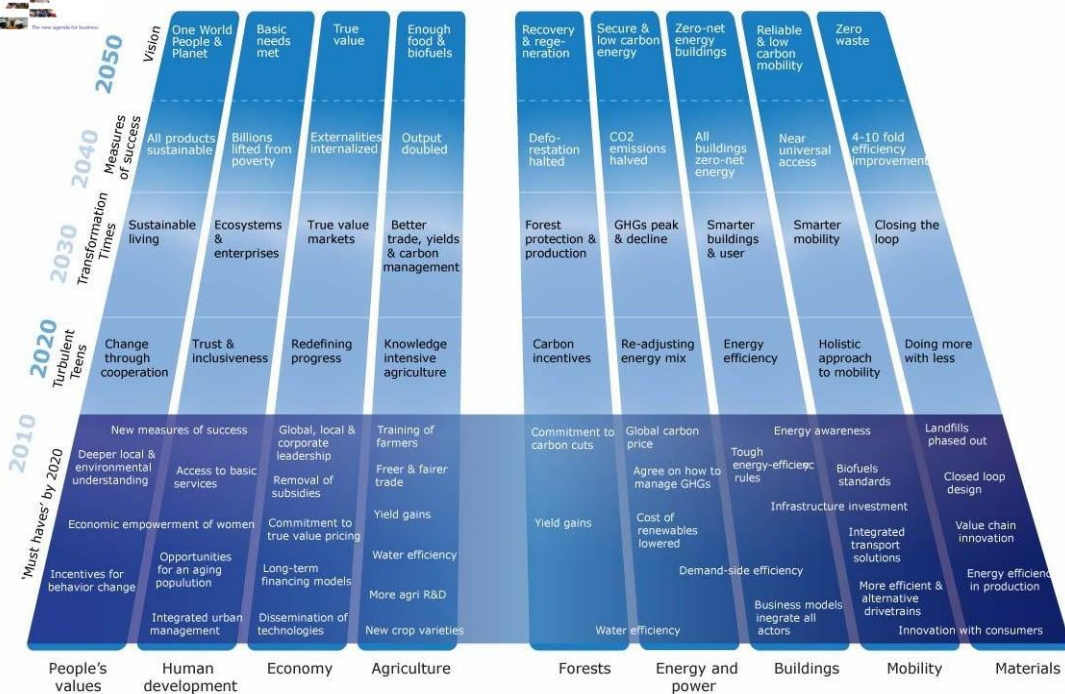
In 2050 some nine billion people live well and in the limits of the planet

In practice this would involve all nations moving into the 1-planet high HDI quadrant (which at Philips was called the "health & well-being space" (see also figure 8)).

In the second part of the Vision2050 project a pathway map was co-created (see figure 14). This communication tool introduces the emerging innovation landscape, makes some first interconnections between different industry sectors visible and shows that business will not be able to implement the changes towards sustainable development without other stakeholders in governments and civil society changing as well. Thus it is a powerful tool that can be used to open up multi-stakeholder dialogues for (social) system innovation and social innovation. (Unfortunately it is not specific enough to guide innovation in a single organisation, since the milestone targets have the quality of "boundaries").



Vision 2050 → a pathway to



Source: WBCSD Vision 2050 report, 2010 →

5

Figure 14: Vision 2050 pathway map

Shifting gears from push to pull

The fact that Sustainability was recognized and communicated as strategic driver for Philips in the Management agenda, the launch of the EcoVision5 program and Vision 2050 marked a turning point for the work on sustainability as innovation driver. For four years the exploration work had been done in a bottom-up "push-mode", stretching the boundaries of the innovation horizon, challenging implicit worldview assumptions and creating confidence. Now it became time to shift towards a "pull-mode". This meant that top-down deployment became possible. This was accompanied by a fundamental shift in role understanding and way of working of the pioneers.

So what happened? Between February and May 2010 about half of the research groups put sustainability on the agenda of their regular group meeting, listened to the news and then worked on new group skills that might be required to cross the disruption zone; sustainable innovation project proposals to fill the Philips innovation pipeline with *flagship projects* relevant for the three EcoVision 5 targets and operational / philanthropic actions the group could perform in order to build a group culture for sustainable development. (See figure 15).

Around this time a new question emerged --- what are the characteristics of a sustainable innovation project which would qualify as a *flagship project*?

PHILIPS

Towards sustainable ...



Towards sustainable PRAS_Lighting

Technology driven & end-user centric & sustainability driven



What can your group contribute w.r.t. Sustainability & the new sustainability leadership KPIs?

What is supporting sustainable development, yet not matching the L-KPIs?

Figure 15: EcoVision5 group deployment & sustainability action plan development

There was no practicable, clear definition available either internally or published outside. So, in order to give the desired guidance and inspiration a "sustainable innovation portfolio tool" was developed embracing the insights of pioneering new innovation methods, business models, ways of cooperating and crossing the disruption zone.

Philips Vision 2015

In September 2010 Philips launched its Vision 2015 as the next public expression of its seriously changed perspective on sustainability. The Vision expressed the following ambition:

Philips wants to be a global leader in Health and Well-being, becoming the preferred brand in the majority of our chosen markets. We believe Philips is uniquely positioned for growth through its ability to simply make a difference to people's lives with meaningful, sustainable innovations.

This, comparable to Vision 2010, was detailed by four key priorities (figure 16):

PHILIPS

Vision 2010 outlined 4 key priorities

- Build a portfolio of businesses that stands to grow on the back of key global trends
- Simplify Philips to optimally tap into market opportunities
- Continue to invest where it matters to fuel future growth
- Lower our costs structurally and increase profitability



PHILIPS

Vision 2015 outlines four key priorities

- Expand leadership positions while benefiting from markets growing faster than GDP
- Be the preferred brand in the majority of our chosen markets
- Lead in sustainability
- Be seen by all stakeholders as making a positive difference in people's lives

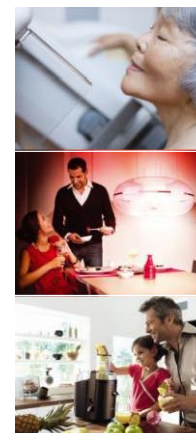


Figure 16: Vision 2010 & Vision 2015

4.7: 2011 -- Accelerating implementation

<i>The external picture..</i>	<i>Philips activities...</i>
<p>2011 was the year of</p> <ul style="list-style-type: none">• civil disobedience: using mobile information technology, citizens in the Middle East organised the Arab Spring• A major earthquake and subsequent tsunami hitting the east of Japan, and causing the nuclear power plant catastrophe of Fukushima• Social unrest about the unjust and broken global financial system expressed through the emergence & spreading of the Occupy movement over 82 countries	<ul style="list-style-type: none">• After 10 years leadership through Gerard Kleisterlee, Frans van Houten became new CEO of Philips with a deep commitment to Vision 2015 and the ambition to go far beyond EcoVision 5.

Consolidating knowledge

Both the last months of 2010 and the first months of 2011 were characterised by a number of personnel changes in top management. This gave the space to consolidate the fundamental, exploratory work of previous years into a series of innovation white papers. The Research programs directly mirrored Philips' Business organisation, thus the three Research sustainability champions were co-responsible for sustainability driving Lighting, CL and Healthcare innovation. They were asked to develop program specific sustainability white papers, explaining which (new) technology requirements were likely to occur in the mid-term (2-7 years ahead) when viewing the market landscape through the EcoVision 5 lens. These white paper reports embodied both Research insights and business sector information. By mid-2011 these documents were available forming an important starting point for the 2012 programming cycle.

In parallel again aligning the CSO, the Business sectors and Philips Research, a thought leadership piece was written consolidating the insights of the last five years about what Sustainable Innovation is all about. This also formed a first step to translate the highly abstract Vision 2050 pathway map into concrete actions that could be performed now. The Sustainable Innovation paper was published in two versions: the external is available on the internet for everybody; the internal version additionally via a workbook helps innovators to identify their first sustainable innovation steps. The role of, and interrelationships between, these documents is illustrated in figure 17.

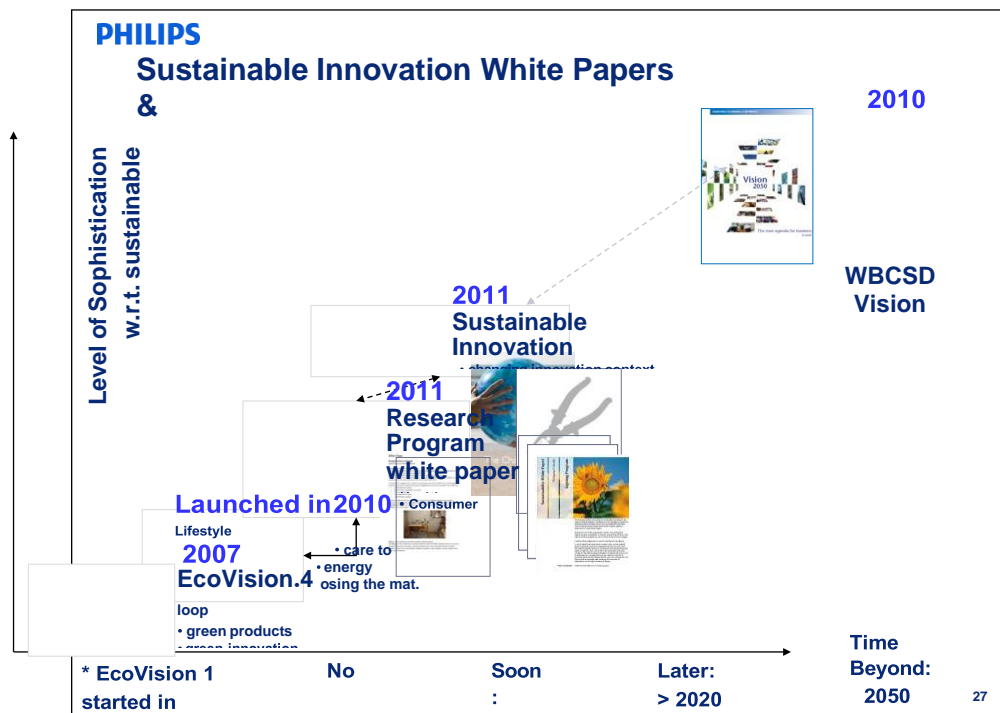


Figure 17: Philips SOI programs & strategies

Organizing for acceleration

In the course of 2010 it became clear that in order to accelerate implementation the sustainability thinking and acting needed to be embedded even more deeply in all Philips organisations. The business sectors' response to this was the enrichment of their sustainability boards through product development, design and marketing experts. The CSO adjusted the monthly sustainability network meeting accordingly and the new situation was well reflected in the "holistic" CSO action plan.

Philips Research decided to grow the *environmental policy board* that formally had organized all operations relevant compliance activities into a *Research Sustainability Board (RSB)* with responsibility for both: environmentally and socially sound operations and sustainable innovation feeding into EcoVision 5 and beyond. The RSB had its first meeting in March 2011 (see figure 18 for more detail on this Board)

Finally, in May 2011 a group of 30 Philips sustainable innovation practitioners gathered to form the

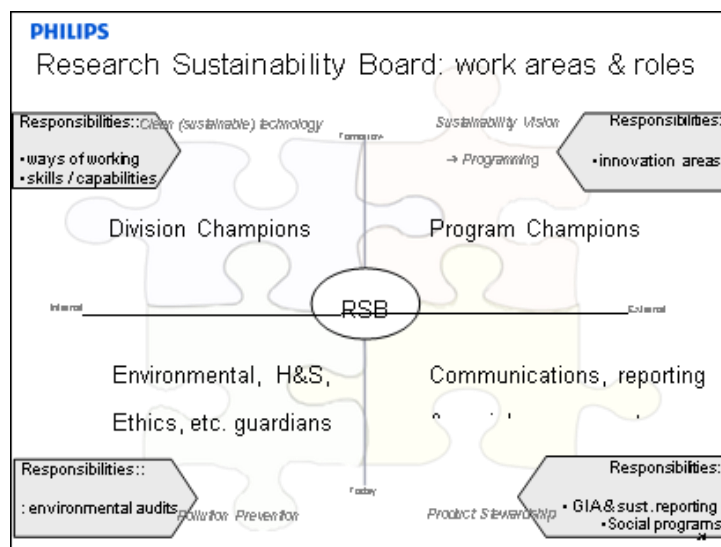


Figure 18: original sheet from RSB kick-off meeting

seed of the sustainable innovation community of practice. This was in line with the new training philosophy of building *communities of practice* for experienced practitioners to accelerate knowledge diffusion and internal network building²³ for core activities. The meeting was organized along the principle of "The Natural Step's: Framework for Strategic Sustainable Development (FSSD)", a well-proven and useful approach to "cross the disruption zone" and define concrete action.²⁴

Handing over the baton

This set of events effectively describes the end of the first phase of the Philips Sustainable Innovation journey. With the consolidation of the learnings in the Sustainable Innovation paper and the Research sustainability white papers, the establishment of the Research Sustainability Board, the initiation of the Philips community of practice for sustainable innovation and the suggestion of a portfolio management tool to qualify EcoVision 5 flagship projects a coherent and broadly-based infrastructure was in place. To summarize key outcomes, by mid-2011:

- Around 12,000 people, (about 10% of the employee base) had been involved globally, at Philips Research and beyond in multiple Philips departments.
- An easy to tell story capturing long term Philips sustainability ambitions, rooted in company legacy had been developed
- Two Corporate-wide Sustainability programs including innovation as key program element had been launched; EcoVision 4 → green innovation, EcoVision 5 → social and environmental leadership KPIs
- A variety of new innovation methods had been successfully tested and led to product, service, market and business model innovations.
- Philips leadership in sustainability has been recognized consistently through multiple external parties
- Internal innovation processes had enriched by green and social criteria
- Sustainability and annual reporting had been integrated
- Top Management had changed fundamentally and the new team started to embrace the foundation in their course setting towards the future ...

And then it really started...

At the end of 2011 the new Philips CEO invited his "top 600" to a jam session about the Philips Vision and ambitions. By intention the head of the CSO did not join the process. He wanted to see what was living in the company. The lively and at times quite controversial dialogue consolidated in Vision 2012:

*At Philips, we strive to **make the world healthier and more sustainable** through innovation. Our goal is **to improve the lives of 3 billion people a year by 2025**. We will be the best place to work for people who share our passion. Together we will deliver superior value for our customers and shareholders²⁵.*

²³ and to fight the observation of many big organizations: the organization does not know what is known in the organization; respectively the "reinvent the wheel-syndrome".

²⁴ More information about The Natural Step and the FSSD <http://www.thenaturalstep.org/>

²⁵ This was already introduced in chapter 3: Philips 2012 .

Conclusions

The preceding section has described in some detail the "what happened" stages on the Philips Sustainable Innovation journey. In this way it is possible to see how sustainability as new innovation driver was explored and finally embedded in the organisation. More practical details of this implementation will be shared in a set of separate cases looking through the lenses of 'operational optimization', 'organisational transformation' and 'systems building'.

At this stage, however, it seems to be useful to conclude somewhat generally on sustainability as an innovation driver. Figure 19 presents this as a next 'long wave' in economic development, building on the theory of Kondratiev waves explored by various researchers. It suggests some possible elements of the size and probable impact of sustainability in economic terms.

The next innovation wave

Sustainable Innovation

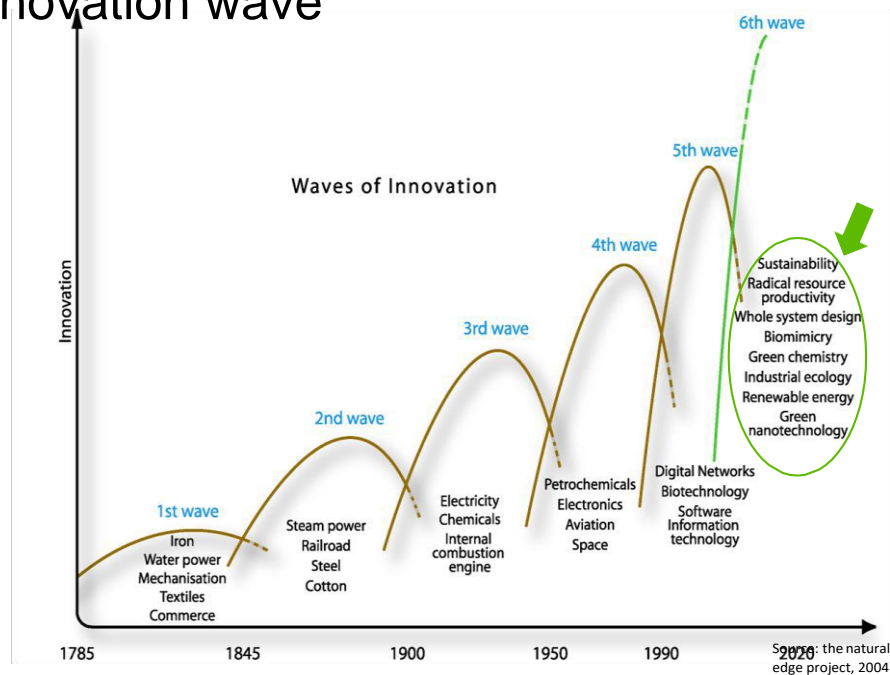


Figure 19: Innovation waves since the beginning of industrialization

The experiences that were gained within Philips provide some support for this view, since embracing sustainability as innovation driver has led to significant changes in the way innovation is focused and organized. But taken further this view invites CEOs to ask the fundamental question:

What is the purpose of (my) business in the 21st century?

This takes on particular relevance when we consider that previous long waves (as mapped by the Natural Edge team) were initiated by a disruptive technology breakthrough yet have in common that

they build on a set of implicit assumptions about the economy. These can be expressed in the following way:

- Human development is dependent on economic growth
Growth is always possible
- Natural resources are unlimited --- there are always enough resources, if one runs out or becomes too expensive, the need to find a replacement becomes so big, that it will be found
- The planet's capacity to reabsorb waste is infinite
- What is possible will be done --- always stretch to the technologically possible
- Common goods are automatically safeguarded
- People appreciate an unlimited freedom of choice in terms of buyable goods
- The principle of ownership
- Money can solve every problem
- If you want you can speed up
- Anything can be measured; only what is measured, gets done

However climate change, the global financial crises, starving children, increasing poverty, plastic garbage lakes in the pacific sea and many other news headlines teach us daily that many of these implicit assumptions are wrong. Thus, in contrast to former innovation waves, the starting point for the Sustainable Innovation wave is a series of social and environmental system crises which challenge us to find new answers to some very old fundamental ethical and philosophical questions:

- *What is our view of the world?*
- *What are our base assumptions?*
- *How do we want to live together?*
- *How do we meet our needs?*
- *How do we manage, use, share, and maintain available resources?*

Fortunately humanity has developed a lot of specialized expert knowledge in recent centuries. New technologies having the potential to solve some of the problems are emerging or even available and will be an important innovation enabler. The 'success story' of scientific progress and the translation of scientific insights into technology is impressive and gives us grounds for further optimism. It doubled, almost tripled the average life expectancy globally in a century which saw a quadrupling of the world population. Currently 1.5 times the world population of 1900 live on a higher living standard than the richest and most noble emperor at that time.

But on the downside today's challenges can seem to be overwhelming; they are certainly complex and highly interconnected. Strategies based on 'do less harm' are unlikely to be sufficient and even those which aim at net positive impact may be limited if that impact is confined to the level of the individual enterprise. The need for system level change and for co-evolution of viable solutions amongst diverse stakeholders is growing.

The good news - which this case underlines - is that sustainable innovation can start anywhere and has a tendency to gather momentum, opening up new possibilities as it accelerates.

The Author

Dr. Dorothea Ernst (previously Dr. Dorothea Seebode)

Dr. Dorothea Ernst is an independent Sustainable Innovation expert.

Between April 2006 and July 2011 she was Senior Director Sustainability at Philips Research and Corporate Technologies. In strong cooperation with the Philips Corporate Sustainability Office and the Philips Sectors – Healthcare, Consumer Lifestyle and Lighting --- she works globally on exploring and implementing sustainability as business and innovation driver. She represented Philips in the Vision 2050 project of the World Business Council for Sustainable Development (WBCSD), where she also led the work stream on Health & Wellbeing.

Before that she worked for 10 years at Philips Lighting. There she first worked for 6 years in traditional innovation roles like project management in R&D, internal consulting and technology management; later she shaped and pioneered newly installed processes and positions in vision and strategy development, new business creation and strategic marketing. In this time she developed a strong and practical expertise in radical innovation. She was the project manager of Think the Lighting Future and head of the Atmosphere Provider Program²⁶.

Ms. Ernst holds a PhD in Physics from the Technical University in Aachen (RWTH Aachen), Germany. Since 2007 she is a LEAD fellow, since its founding in 2009 a steering group member of the Green Economy Coalition. Since 2011 she serves on the steering team of the Exeter Sustainable Innovation Lab.

²⁶ A case study about this work can be found here <https://johnbessant.org/case-studies/>