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# The Sustainable Business Workbook

## Resource-Life Extension

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## Before you begin…

Whether you are undertaking the requirements of this workbook for your own purposes or with the intent of completing a certification course in sustainable development, the following information should be of help:

The companion texts for this publication are: *The Sustainable Business* (2nd edition) and ***The Sustainable Business Workbook***: ***Waste Elimination***. The seven sections that comprise the companion texts (Preparation, Processes, Preservation, People, Place, Product, and Production) correspond to the similarly titled sections of this publication. Although not definitive, together, these sections will help guide you through the beginning stages of the resource-life extension (sustainability) process.

### Read the companion texts thoroughly before beginning this workbook.

Likewise, read this workbook from cover to cover before you begin its exercises. Many of the subject areas that comprise sustainability are both non-linear and inseparable from one another. For example, certain aspects of ***Processes*** overlap into ***People,*** and so on. This can be confusing when trying to determine where to begin work as well as where and how to place the inter-connected information you collect. In such cases, use your best judgement. Accurately measuring and recording the data you are required to obtain, being consistent with its placement, and following through with the exercises is more important than arguing about the category into which your results are placed.

Similarly, the data estimation requirements set forth in this publication may not fit perfectly with the uniqueness of your business, its product/service, or the environment in which your business operates. Again, do the best you can to meet the highest of standards. Although all of the requirements laid out in this workbook must be met, feel free to modify them in order to achieve the intended result: resource-life extension.

If you have any questions, turn to your waste-elimination teams for answers. One of the aims of this workbook is to promote self-learning, self-development and self-discovery, all of which are best achieved by learning to resolve your own problems. Additionally:

- *Believe in your creativity and the creativity inherent in your people*. If you have the right attitude and think you can be innovative and successful, you probably will be.
- *Encourage nonconformity*. Allow team members to express different viewpoints.
- Reach out beyond your *specialization*. Use other people (perhaps in different departments) to expand upon ideas and assumptions.
- *Ask 'Why?'* Don't accept that things have to be done the way that they've always been done. Search for more than one right answer or one way to do things.
- *Take the time to think*. Step back, think, play around with ideas, and grow.
- *Don't be afraid of trial and error*. Making a few mistakes is often a path to success.[1]

We hope that completing this workbook is informative and profitable. Good luck!

[1] Adapted from: A Kick in the Seat of the Pants, by Roger von Oech, Harper & Row, NY, 1986.

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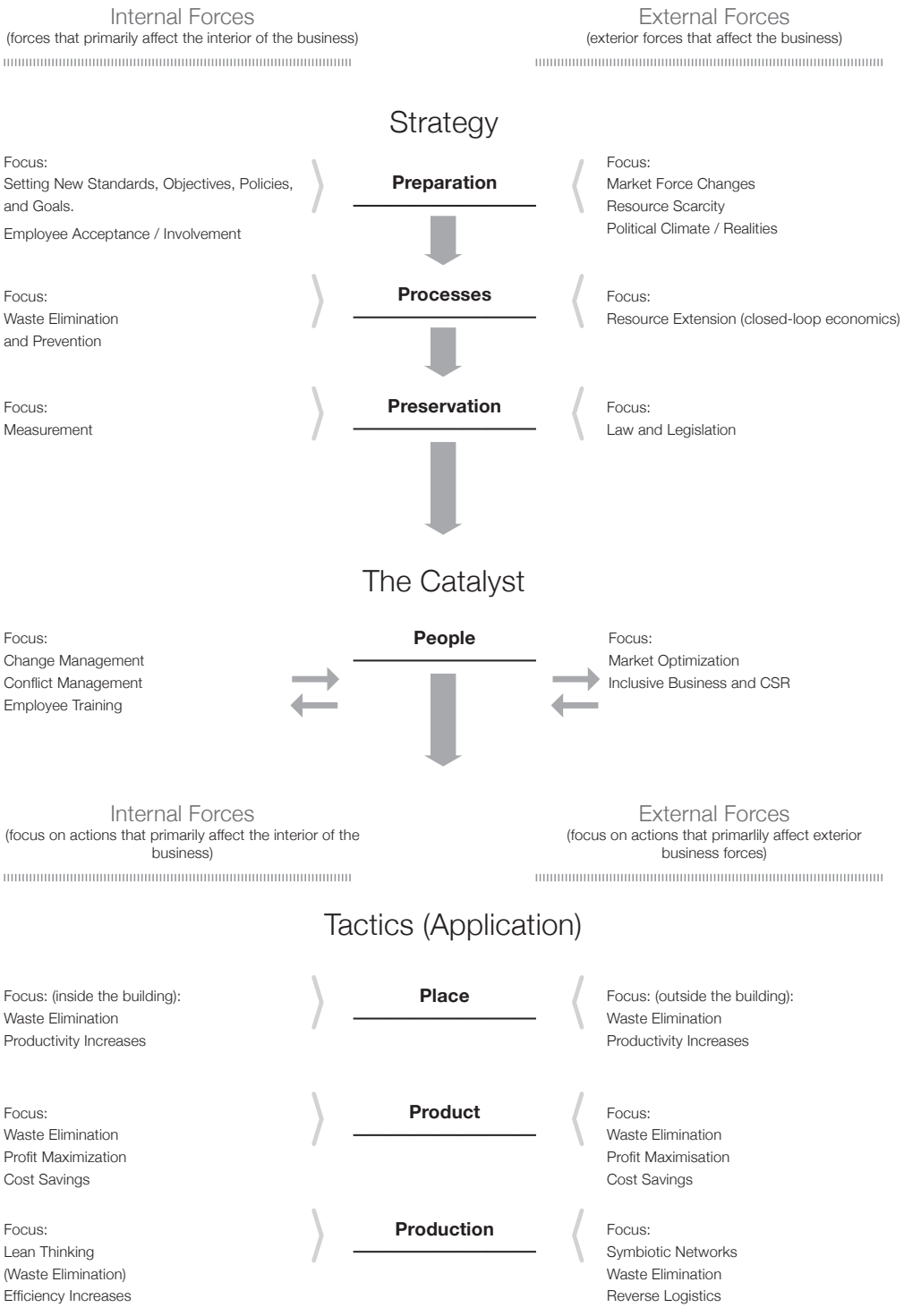
The 7-P Model (A Framework for Sustainablity)

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# The benefits of working through the step-by-step approach to sustainability…

## Expected Learning Outcomes and Competencies

If follow the approach in *The Sustainable Business* (2nd Edition), *The Sustainable Business Workbook: Waste Elimination* and *The Sustainable Business Workbook*: *Resource-Life Extension*, you will find a number of benefits for you and your organization. These include:

### Knowledge and Understanding

- An increase in awareness of business/management issues and the relationship these issues have with long-term thinking and action (sustainability) in regards to profits, cost-savings, waste elimination, resource optimization and job security/creation,
- A better understanding of financial value, organizational value, and social value,
- Improvement in the comprehension of applied sustainable practices in both 'blue collar' and 'white collar' settings, and,
- Development of the ability (and that of your organization) to identify, measure and analyze sustainability-based practices and strategies in a work environment.

### Subject Specific Skill Improvements

- An increase in proficiency (and that of your organization) so as to evaluate, synthesize and apply tools for implementing sustainable business practices,
- Improvements in terms of measurement capability and the capacity to analyze sustainable initiatives,
- An enhanced ability to identify direct and indirect costs associated with sustainable practices (or the lack of sustainable practices), and,
- An increase in the ability (and that of your organization) to identify and capitalize upon best practices.

### Personal and Transferable Skill Development

- Improvement in the ability (and that of your organization) to plan, measure, manage and lead sustainability-orientated concepts and practices in a real work environment alongside others as part of a team, and,
- A rise in the capacity (and that of your organization) to learn how to produce results and enable others to produce results.

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In this age, which believes that there is a shortcut to everything, the greatest lesson to be learned is that the most difficult way is usually the easiest.

Henry Miller

Faster is slower

Peter Senge

The truth will set you free, but first, it will piss you off

Gloria Steinem

# PREPARATION

...the act of making ready (i.e.: putting or setting in order in advance of an act or purpose). Before beginning the sustainability process it's important to: (1) learn what sustainability entails, (2) articulate why the pursuit of it is important, and, (3) establish the groundwork that will instil both managers and non-management employees with enthusiasm, answers, and support. Without this foundation, most attempts at sustainability are prone to confusion, suspicion, disorganization, and dwindling motivation - as well as wasted time and efforts.

## Estimation versus Application: an analysis

1) On page 29 of *The Sustainable Business Workbook: Waste Elimination*, you were asked to compile a list of 'Total waste-elimination estimates' and 'Total estimated cost savings'.

Using a graph similar to the one below, record your estimates and compare them to the actual waste-elimination numbers and cost savings you obtained (if you followed through with the solutions that you formulated). Next, in the form of a percentage (and using + or - ), record the difference between the actual result and the estimation (for example, if the actual result is 5% higher than the estimate, write +5% in the designated space; if the actual result is 5% lower than the estimate, write -5% in the designated space)

| | | Total amount eliminated (by unit) annually | | | Total annual cost savings | | |
|---|---|---|---|---|---|---|---|
| **Type of waste** | **Unit of measurement** | **Estimated** | **Actual** | **+/- difference (%)** | **Estimated** | **Actual** | **+/- difference (%)** |
| Liquid: | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Solid: | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Gases: | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Other waste: | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Other Material Decreases: | | | | | | | |
| Raw Materials: | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Resources: | | | | | | | |
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| | | | | | | | |

### Averaging the averages using the (above) table

2) Add the averages in the waste elimination column and determine the overall average.

3) Add the averages in the cost savings column and determine the overall average.

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### Records and Measurement

1) Determine the accepted (or pending) unit/system of waste and resource measurement used in your country or region (for example, in Europe you can use the *'Product Environmental Footprint'* and the *'Organisation Environment Footprint'* as references (both of these documents are available for free on the internet).

Do the measurement units that you obtained in the first workbook correlate to the types of measurements suggested or required by your local, national or regional government?

If not, mathematically convert your measurements so they meet government requirements. Display them.

### Understanding the change process: a reassessment

1) Create a short journal with seven separate sections each labelled with a 7-P heading (Preparation, Processes, Preservation, People, Place, Product, Production).

In each section, on the left side of the page, write three major changes that your business has made, or will make, in regards to waste elimination. On the right side of the page, directly across from each entry, describe the procedure or policy that the change replaced. Share this information with those who must work with it and record their reactions.

### Anticipating problems and paving the way for their quick resolution

1) Briefly describe the problems your company encountered when establishing (and enforcing) its waste elimination policies and procedures.

- How were these problems resolved? Explain your answer using the terms and concepts explained in chapter 15 (pages 104-109) of *The Sustainable Business*.
- Do any outstanding issues or problems need to be resolved? Explain.

2) Gather together key company personnel who have established good working relationships with your suppliers and distributors. Use them to list, discuss, and describe any anticipated problems you may encounter with suppliers and distributors as your business strives to eliminate waste and extend the life of its resources.

- What is the primary motivation of each supplier and distributor?
- Can the waste-elimination and cost savings data that your company collects be used to convincing suppliers, distributors and other stakeholders of the importance of your mission? Explain.

3) How will the information from above (as well as any additional information) be communicated to and from managers and employees?

- What forms of measurement will be used?
- How will time-to-completion plans be estimated and enforced?

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## Laying the groundwork for resource-life extension

1. What are the most challenging issues your company is facing regarding resources (e.g.: raw materials, money, labour, time, skills, capabilities ...)?
2. Amongst each department and speciality in your organization, who is best suited to help develop and lead the necessary change processes?
3. What systems of measurement will be used to prove results? How will your measurements be included, recorded, and shared in your financial accounting system?
4. How will your business enable its key people and their teams to succeed?
5. What type of training program will your company adopt?
   - Explain how information and results from on-going projects will be incorporated into a results-orientated training program.
   - How will on-going feedback be given to others and be obtained from others?
   - How will information and results be displayed/distributed to others in-house as well as to colleagues at other company facilities?
6. How will time-to-completion plans be estimated and enforced?
7. Is everyone on-board and in agreement (board members, administrators, middle-management, employees, stakeholders, customers, suppliers, distributors...)?
   - If so, how do you know that they fully support resource-life extension initiatives and that they will continue to support them?
   - If not, how will you get them on-board, motivated and dedicated?

## Developing and prioritizing a resource-life extension strategy

8) The following sustainability issues, which are often associated with Elkington's 'Triple Bottom Line' (1994) and/or ESG ('environment, social and governance') primacies, can help your business **prioritize** and formulate a more holistic sustainability strategy. This list is not all-inclusive so please add any additional priorities in order to comply with local, national, regional, industrial or customer-orientated requirements that affect your industry as well as the laws, regulations, or protocols that are unique to your business.

Which of these sustainability issues matter most to your company - particularly in terms of legal and regulatory challenges **and** customer expectations and demands? Prioritize them.

### A. Preparation

- Business policy, standards, codes of conduct (incl: transparency policy)
- Regional ethics (including: codes of conduct, standards, and policy)
- Political affiliations and/or lobbying
- Board and/or administrative involvement

### B. Processes

- Establishment of waste elimination and resource-life extension models, idea catchment, development and assessment, assigning responsibility...
- The building of communication pathways (information sharing, teamwork functioning, etc) including conduits to outside expertise
- Employee involvement systems, ability to take action and be rewarded
- Cooperative network dialogues, partnerships, and alliances

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C. Preservation

- Measurement, accounting, and accountability (including public relations)
- Resilience of the business (new laws, political unrest, and other unforeseen changes)

D. People

- Recruitment, training, and retention of employees (e.g.: diversity, working conditions, age structure, equal opportunities and fairness, etc)
- Labour practices (including child labour, treatment of women, general working conditions, etc...)
- Labour relations (including union relations)
- Health, safety and quality of work life
- Employee input
- Worker compensation / Executive compensation
- Customer satisfaction
- Customer input (incl: access customers have to your organization as well as the access your organization has to its customers)
- New markets

E. Place

- Energy procurement and use; architectural/layout efficiency
- Building-related water procurement, use, and disposal
- Community involvement and community relationship improvement

F. Product

- Product and/or packaging design
- Research, innovation and competitiveness
- Marketing ethics (including labelling)

G. Production

- Production-related water procurement, use, and disposal
- Waste management and disposal
- Raw material procurement, transportation, storage (logistics)
- Impact of the business on the environment (including: biodiversity impact, climate change, toxins use, pollutants, industrial accident management, etc)
- Product shipping and/or delivery (incl: transit packaging and transportation)
- Production innovation, efficiency and transparency issues

HELPFUL TIP

Use the relevant issues listed above and the exercises laid-out in this workbook, as well as the experiences gained from your previous waste-elimination drive (from the first workbook), to: (1) develop a workable, **prioritized**, **long-term strategy**, that, (2) helps guide your business through the resource-life extension process.

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# PROCESSES

A *process* is defined as: (1) a series of progressive, interrelated steps or actions from which an end result is attained, or, (2) a prescribed procedure or a method of conducting affairs. Either way, processes form the belief systems, philosophies, or thought patterns that constitute the work environments in which goods and services are manufactured (seen from this angle, a business process can also be referred to as a 'business model' or 'the way we do things around here'). Most practitioners agree that for any business process to function properly, total commitment from all involved is mandatory. Success is also reliant upon a functional network (or 'fit') between the process, its product, and the business's customers.

HELPFUL TIP

The terms 'Resource-life extension' and 'closed loops' can have different connotations, however, each term refers to using a resource beyond what constitutes the current accepted life-span of the resource in order to eliminate and prevent waste. Finding multiple ways to benefit from a single resource is just one way that resource-life extension can be achieved. Examples include:

- training an employee to perform different tasks,
- finding multiple uses for a particular chemical, tool, material, machine, building or process,
- sharing employees, tools and equipment, shipments/deliveries, research projects, joint
- purchases, etc… with other companies,
- exceeding the average lifespan of a tool, machine, building or material,
- decreasing employee turnover and decreasing absenteeism,
- cascading uses of components, materials, resources (e.g.: water)…,
- and so on...

Note: Success with resource-Life extension sometimes requires working in cooperation with other organizations in order to achieve results. A good goal to strive toward is to try and double the average life expectancy of a resource cycle (or more) without creating any form of waste.

## Exterior

### Cooperative Networks

1) Identify businesses that use the same (or similar) resources and materials that your company uses and investigate a cooperative-network venture with the goal of extending these resources (provide three examples). Potential business partners can include:

- suppliers
- competitors
- businesses in different industries
- governments, NGO's..., etc

2) List and explain the advantages and disadvantages involved in each proposed venture.

3) Provide examples of how eliminating waste *before* extending your resources will lead to increased financial savings and/or greater efficiency.

Note: The exercises in the *Product and Production* sections of this workbook will help enrich your answers.

## Interior

### Building systems to extend employee value (for use with the 'People' section)

3) Create a system of measurement to determine employee turnover for every job category in your organization and establish acceptable turnover cycles for each.

4) With the aim of ensuring that your employees remain flexible and adaptive and continuously develop new ideas that eliminate waste and increase value, study Chapter 8 (Lean Thinking) of *The Sustainable Business* and, together with your teams, identify and improve three inefficient work situations or work processes.

- Describe the advantages and/or disadvantages of following through with your team's suggestions.
- How will you reward employees for their input? (recognition? material incentives? rewards? money? In-house competitions? Inter-facility competitions?...)

5) After completing exercises 3 and 4, develop a permanent system that will allow your business to encourage and collect ideas from employees and other stakeholders on an on-going basis. How will you ensure that this system: (a) is steadily improved, (b) remains in operation, and, (c) is used (in part) to check for reductions in employee turnover?

HELPFUL TIP

Remember: **waste-elimination leads to resource-life extension**. Do NOT attempt to extend the life of a resource without first seeking to eliminate waste and inefficiencies.

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# PRESERVATION

*Preservation* is defined as:

- the process of keeping something in existence,
- to keep up or maintain something,
- the act of protecting or safeguarding something from harm or injury,
- keeping possession of, or retaining, what currently exists.

Any way it's looked at, preservation is not about standing still. In a business context, sustainability demands that two forms of preservation take place. The first is *internal* and involves the collection and analysis of real-time measurement in production processes and product use. The second form is *external* and includes keeping ahead of laws and legislation, industry improvements, directives from customers (e.g.: 'scorecards' insisting that packaging or toxins be reduced), disruptive trends, and other forms of change.

## External issues

### Increasing the resilience of your operation

1) Explain how your business investigates, collects, discusses, and shares information that affects its survival. Are employees involved in all stages? What is their reaction to the involvement they are asked (or required) to contribute? If employees are not involved, why not?

2) Using the data you collected and analysed for the energy and raw material sections of the *Waste Elimination* workbook, as well as the input of your waste elimination teams, explain the following:

a) how your business will adapt to rises in energy prices as well as the possible unavailability of the energy sources you require.

b) how your business will adapt to rises in raw material and other resource prices (including water) as well as the possible unavailability of the raw materials and resources your business requires.

c) how your business will cope with rises in waste elimination prices, waste water treatment prices and air and water emission/pollution charges including Green House Gas (GHG) emissions (including CO2).

d) your organization's emergency backup plan to cope with unexpected change.

e) how does your business discuss and develop 'emergency backup' issues with its stakeholders (investors, employees, suppliers, distributors…) and how often it does so.

3) Is it in the best interests of your business to exceed current company policies and procedures (or government laws)? Explain.

## Internal issues

### Increasing the resilience of your operation

4) Describe the ways in which your organization develops individual and team learning processes for the purpose of continually expanding its capacity to create its future.

5) Discuss and develop the major forms of measurement your business will use to record resource-life extension practices in the *People, Place, Product* and *Production* categories of this program? (e.g.: forms of measurement should include: financial data [costs, revenues…], material cycles [the number of life-spans it obtains from its materials], time savings, and so on…).

6) Describe the standards, goals or targets your business must establish to capitalize upon resource-life extension benefits.

7) Did your employees help set the new standards and targets? What is their overall reaction to them?

8) Describe the role the different departments of your business will play in achieving your new goals.

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# Public relations

## Damage prevention and control

This exercise was developed from a true-life situation in which child labour allegations were raised in the supply chain stages (material sourcing) of a globally manufactured and distributed product. A representative from the manufacturing sector of the industry suggested that the best course of action was to do nothing rather than deal with the problem ('Who are we to police such practices?' he stated).

The point here is that even though your business may not be directly involved with an illegal or unethical practice that is occurring somewhere in your supply-production-distribution chain, your business (and the people in it) may be declared 'guilty by association' in the eyes of the public. So with that in mind…

9) List potential problem areas amongst the stages of your supply-production-distribution chain (use the list on page 9, exercise 8 of the *Preparation* section of this workbook, as well as other sections of this workbook, to help identify problem areas).

- Map the stages of your product/service chain and describe the type of problems that could arise in each stage.
- Explain the steps or actions your business will take to prevent these (and other) problems from happening.
- Explain what your business will do (i.e.: its 'plan of action') if one or more of these problems arise.
- What organizations can you work with to help identify problem areas and decrease further potential damage to your business?

HELPFUL TIP

To complete the above exercise, it may be worth noting the following quote from Khalil Gibran ('We choose our joys and sorrows long before we experience them') as well as the often quoted 'Two Rules of Politics':

1. **Tell it early; tell it all; and tell it yourself** (i.e.: be transparent and don't allow someone else's words or actions define you).

2. **If you're explaining, you're losing.**

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# PEOPLE

Sustainability is not a technological issue. At its core it's a behavioural issue and as such it is dependent upon teamwork, cooperation, and motivation. For sustainable practices to take root and produce results, every employee - whether he or she is a cleaner, a production line worker, or an administrator - (as well as paying customers) must contribute to the process. No matter what level or experience a person has, everyone has the potential to discover a sustainable path that has been overlooked. Just as important, any employee has the ability to add that final jolt of effort that avoids failure and promotes success. Understanding the importance of people in all phases of the sustainability process is therefore necessary to ensure that a thorough and combined effort on all fronts is made

Simply put, people are a business's ultimate competitive advantage.

HELPFUL TIP

When undergoing a resource-life extension learning and/or design process, think in terms of developing people-based *systems* that generate the type of *continuous* results your organization desires (see page 11). Developing people-based systems includes: (1) creating individual and team-based organizational structures that encourage and collect ideas, (2) cultivating people so that they have the capability (and desire) to find better ways of doing things, and, (3) allowing your people to make measured, responsible changes on their own. Note that in some cases, change may not be possible now because needed innovations or new technologies do not exist. This is why it is necessary to put systems in place that allow your people to be ready, willing and able to accept (and adopt) changes and innovations as they are made available.

### On-going employee productivity and involvement

1) Explain your business's systems of measurement, policies, procedures (actions) and results in terms of optimizing employee labour (you may wish to include the system of measurement you developed for questions 3-5 of the *Processes* section on page 12). If your business has not given much thought to this subject, sketch a plan and include the input of your employees.
Your answer should include (but is not limited to) the following topics:

- increasing the quality and quantity of employee feedback and input,
- investigating and/or adopting flexible work hours,
- continuous education and training (including training employees to perform multiple duties/tasks, skills development, knowledge transfer between employees…),
- local sourcing (hiring local people, local contractors, local skills…),
- reducing employee turnover,
- workplace equality measurement (including hiring and fairly treating women, the handicapped, minorities) and so on…

### Continuous assessment of human resource value systems

2) Briefly describe your company's current in-house communication methods and pathways. Examine and elaborate as to how they can be improved to better benefit management, employees and stakeholder in terms of:

- Information collection, evaluation, and display,
- Determining the types of analytics needed to resolve problems/challenges (including deciding what information is relevant and what constitutes meaningless 'noise'),
- Generating more contributions and ideas from company stakeholders.

### Increasing long-term customer value

3) Examine your business's markets and determine how more continuous value can be obtained from customer bases. Issues that fall within this subject area include (but are not limited to):

- Regularly collecting and analysing customer demands and expectations,
- Measuring your business, its methods and its products against competitors,
- Reaching out and networking with other organizations to optimize resource-life extension objectives…

4) Using ethical industry benchmarking procedures, examine a viable program that facilitates repeat customer purchases (or facilitates customer retention) and, together with your work teams, examine how a similar program can be adapted to fit your business and its customer base. Include a system of measurement that verifies results – then set a target.

### Job security and job creation

5) Do you believe that your business's resource-life extension efforts will result in increased job security and/or the creation of new jobs? How will you measure it? Explain your answer.

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# PLACE

Whether in an office, a factory, a store, or a home, most work is conducted in buildings – and the vast majority of the world's buildings are problematic. In some countries, buildings consume more than 68% of all electricity produced, account for over 39% of the nation's energy demands, and are responsible for contributing 38% to the country's total carbon dioxide emissions. Equally as unsettling, it's not uncommon for indoor pollution levels to be two to five times higher (occasionally 100 times higher) than outdoor levels due to dust and fumes from interior building materials, cleaning solutions, production processes, central heating and cooling systems, radon gas, pesticides, paint, glue, carpets, and so on. In the USA alone, nation-wide building-related productivity losses and illnesses resulting from toxins can cost businesses $60 billion annually. Eliminating these expenses is therefore fundamental to the sustainability process.

Note: here, waste associated with 'Place' refers to that which comes from the use and functioning of a building, or an area within a building, not from production processes.

HELPFUL TIP

If you or your staff do not have the training or expertise to fully understand architecture and its related issues and fields (e.g.: building material science, interior design, regulations and regulatory codes, etc), consider bringing in a reputable expert for advice. Then ensure that a system of measurement is established before you begin any 'improvements' so that your waste elimination and resource-life extension work can (and will) be effectively monitored and assessed.

### Exterior resource-life extension

1) In the previous workbook, you were asked to list and describe the actions your business can take to eliminate and prevent *exterior* building and/or workplace waste. Here the focus is on extending resources so as to reduce costs further.

Examine your energy and water needs and determine if/how your business could benefit from resource-life extension practices. Examples include, but are not limited to: developing dual purposes for the building, renewable energy, energy cascading, water reuse, grey water use, heat transfer, green roofing, ensuring that building-materials are recycled, recyclable and from renewable sources, car-pooling and/or access to public transport facilities, purchasing from local businesses (including maintenance and repair services), location issues (i.e.: is your business situated in an ideal location for deliveries, shipping, customer visits and other requirements?), distribution optimization (e.g.: road to rail transport for goods), building design efficiency (including exterior surfacing), car park efficiency (colour, surfacing, placement…), working with your local community, etc…

- Describe the costs of two energy-related actions and two water-related actions.
- Record the estimated payback period (in terms of time and ROI) for each action.
- Record the estimated *annual* cost savings of each action.

### Interior resource-life extension

2) Do the same (as above) with the *interior* of your workplace (and/or retail center if appropriate). Examples include, but are not limited to:

- improving your current building maintenance program
- purchasing refurbished or remanufactured furniture, fittings, machinery and tools, office supplies, etc…
- using (and optimizing) all available workspace
- improving work environments and comfort levels (to increase productivity)
- maximizing the use of natural light (in conjunction with regulations that set lumen-level requirements) and ventilation
- taking advantage of geothermal heating/cooling, ground-couples heat exchanger, (or other closed-loop temperature control system)
- utilizing grey water (where appropriate)
- and so on (include your own ideas).

- List and describe the costs of at least four actions.
- Record the estimated payback period (in terms of time and ROI) of each action.
- Record the estimated *annual* cost savings of each action.

HELPFUL TIP

Remember to involve your employees so as to lighten your workload and to ensure that your people feel as though improvements are being made by them rather than forced upon them.

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## Cost Savings

3) Create a graph similar to the one below. Using the interior and exterior data you have collected, enter the amount of estimated annual cost savings (in Euros) that your business can expect to save if it adopts the actions analysed in questions 1 and 2. (Note: *'local application'* refers to the estimated amount saved in your business or department alone. *'Company-wide application'* refers to the estimated savings if the applied savings are adopted across all your business's buildings or structures)

| Resource | estimated total annual savings (€) (local application) | estimated total annual savings (€) (company-wide application) |
|---|---|---|
| Electricity | € | |
| Oil / Diesel | € | |
| Gas | € | |
| Water | € | |
| Other | € | |

## Revenue Enhancement

4) Select one revenue-producing idea from question 1 and another idea from question 2 and put them into action (make sure to take accurate measurements before and after). Then enter the amount of estimated revenues (in Euros) that your business can expect to earn if it adopts the actions you analysed.

Fully explain (justify) your conclusions, then create a graph similar to the one below and fill in (Note: *'local application'* refers to the estimated amount saved in your business or department alone. *'Company-wide application'* refers to the estimated savings if the applied savings were adopted at all your business's buildings or structures).

| | estimated total annual revenues (€) (local application) | estimated total annual savings (€) (company-wide application) |
|---|---|---|
| Increased production | € | |
| Increased sales | € | |
| Other revenue | € | |
| | | |

## Lessons Learned

4) List and describe the lessons you learned. Did you have to modify your original plans? If so, what was changed and how was it changed?

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# PRODUCT

Because of the vast quantities of materials and energy that most products require, not to mention the huge amounts of waste they produce while they're being manufactured, making products more efficient (and more efficiently) is crucial to reducing the costs of running a sustainable business. To be sure, redesigning products and the methods used to make them is time-consuming and arduous, however, many practitioners attest that it can also be the most financially rewarding.

HELPFUL TIP

If you or your staff do not have the training or expertise to fully understand material-sourcing variables, chemical engineering, product design, and other subjects (and the sciences) that comprise the efficient and effective development of products, consider bringing in reputable experts for advice. Then ensure that a system of measurement has been established before you begin any 'improvements' so that your waste elimination and resource-life extension work can (and will) be effectively monitored and assessed.

## Materials and Components: listing and sourcing

1) Create a 'material list map' based on the materials your business uses to produce a product and/or service (this exercise can be accomplished in a way similar to the 'process map' you created for the *Production* section of the waste elimination workbook). Because this exercise requires an analysis of sensitive subject matter, you may wish to assign code names to the materials and/or components that are being examined.

- Choose a popular product or service produced by your business (including packaging)
- Make a list of all the product's components (and packaging components)
- List the materials that comprise the components
- Map the sources of the materials

2) Explore key 'resilience of the operation' factors by addressing the following in regards to your material list and its source map. Describe any inherent weaknesses in each of these issues and provide ideas as to how these weaknesses can be improved.

- Political stability of the region where the material is sourced
- Transportation issues
- Fair trade issues
- Are the materials provided (and transported) by one source or several?
- Can each material (and its transport) be substituted or replaced with a more economical alternative? (Can any material or process be eliminated?)
- Is joint purchasing (with another business) an economical alternative?
- Can your suppliers be substituted or replaced with a more efficient alternative?
- Who is responsible in your business for regularly checking industry innovations and how is the data that is obtained from these checks disseminated and discussed?

The following exercise refers to the *'10 Ways to Minimize Product Waste'* (Chapter 20, page 146) as well as 'Minimizing (Chapter 21, pages 151-154), which are found in *The Sustainable Business* (the textbook for this program) You may wish to use your work from the product section waste elimination workbook (page 22) to supplement your answers.

3) Explore how your product and its materials (or your service and its components) can be improved in accordance with each of the *'10 Ways to Minimize Product Waste'*.

- Describe the costs involved for each action.
- Estimate the *annual* cost savings of each action.
- Estimate the payback period (in terms of time and ROI) for each action.

4) Currently, what percentage of your chosen product's total materials can be re-used in a closed-loop process? What percentage of these re-useable materials are currently part of a closed-loop process?

- How can these two figures be improved? Explain your answer.

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## Exterior resource-life extension

5) How your customers use and dispose of your product or service is integral to the resource-life extension process.

- Can your product or any of its components be converted into a service in order to extend the life of the involved resources? (see chapters 4 and 5, pages 42-53, of *The Sustainable Business*)
- Describe the costs involved
- Record the estimated payback period (in terms of time and ROI)

Note: If your business is an information services provider, a financial institute, an insurance provider, or other form of service business, examine ways it can reduce the following:

- fraud
- risk
- weaknesses in processing systems, documentation, billing, and so on
- poor investments
- employee training (or lack thereof)
- customer relations (or lack thereof)
- 6) Can your products packaging be changed (e.g.: square packages or shipping containers for liquids), reduced or eliminated? Can it be eliminated? Explain your answers.
- 7) Can the waste created when a customer uses and disposes your product (or service) be reduced or eliminated? Can this waste be used as a raw material by your business or another business? Explain your answers.
- 8) Examine your resource-life extension ideas. Using the graphs and data you created in the Product section of the previous workbook (page 23, exercises 3 and 4), estimate the additional amount of waste your business can expect to eliminate by implementing your resource-life extension ideas. Estimate the cost savings.

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# PRODUCTION

...The mechanical, electric, biological, or chemical processes used to transform materials or information into products or services and deliver them to where they need to be. Offices, factories, farms, and restaurants all rely upon equipment and machinery in one form or another to turn information and resources into goods and services and since many of these tools (and processes) can waste as much or more than they produce, they present a prime target for efficient, sustainable practices.

HELPFUL TIP

If you or your staff do not have the training or expertise to fully understand manufacturing design and/or the use of labor, machines, tools and chemical and biological processing to efficiently and effectively produce products and services, consider bringing in reputable experts for advice. Then ensure that a system of measurement has been established before you make any ‘improvements’ so that your waste elimination and resource-life extension work can (and will) be effectively monitored and assessed.

## Interior Analysis

### Process map analysis

1) Update the process map you created from the waste elimination workbook (page 26, exercise 1) and expand upon it by analysing the distribution systems and channels (i.e.: the interconnections) that flow out from it.

2) Using the updated process map (from above) as a reference, identify and discuss with your teams how resource-life extension principles can be profitably adopted. Examples of possible ideas include, but are not limited to:

- equipment (buying remanufactured equipment, renting/leasing equipment instead of purchasing, regular maintenance to increase the life of the equipment, sharing equipment or tools with other organizations, intensifying the use of equipment, [getting more out of it], eliminating unneeded processes, etc)
- the use of continuous flow processes instead of batch processes
- changing from supply chains to supply circles
- transportation/delivery optimization (ensuring that vehicles are filled to capacity, sharing deliveries with other businesses, using less transport packaging or reusable transport packaging, etc)
- energy use (energy cascading, heat transfer, development of more economical heating/cooling systems, renewable supply sourcing, etc)
- raw materials (eliminating toxins, substituting expensive materials for less expensive alternatives that require less processing, re-using water in closed-loop processes, replacing water-based processes with more economical alternatives, etc)
- time savings
- labour (increased training, increased multi-tasking, reward systems, etc)
- resilience of the operation factors (establishing back-up plans for energy, replacing processes with more efficient or more economical alternatives, purchasing local materials and services, and so on).

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3) Create a graph similar to the one below and record the amount of money that your business estimates it can save (cost cuts) or make (increases in production) as a result of its resource-life extension ideas.

| Category | Unit of measurement | Total amount of money saved (left) and/or made (right) |
|---|---|---|
| Equipment: | | |
| | | |
| | | |
| Time: | | |
| | | |
| | | |
| Labour: | | |
| | | |
| | | |
| Other: | | |
| | | |
| | | |

Under each category list a specific name or sub-classification if applicable

4) Briefly (but fully) explain each cost-saving or revenue-increasing idea along with how you arrived at your estimations.

## Exterior Analysis

### Synergistic Networks

5) Expand and broaden the *cooperative networking* information you put together in the first workbook in regards to 'synergistic' industrial arrangements or 'industrial ecosystems'.

6) Explain how your business regularly assesses its industry, its competitors or other idea-rich sources for innovations and how this information is processed and shared in-house as well as between your offices, factories or facilities. Can these information channels be improved? If so, how?

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## Resource-life extension savings/revenues

7) Create a graph similar to the one below and record the amount of money that your business estimates it can save (cost reduction) or make (increases in production) as a result of its exterior resource-life extension ideas.

Briefly (but fully) explain each of your conclusions.

| Type of Waste | Unit of measurement | Total amount eliminated (by unit) annually |
|---|---|---|
| Liquid | | |
| | | |
| | | |
| Solid: | | |
| | | |
| | | |
| Gases: | | |
| | | |
| | | |
| Other: | | |
| | | |
| | | |

} Under each category list a specific name or sub-classification if applicable

## Total Estimated cost savings and revenue increases

8) Record the overall estimated interior and exterior cost-savings and revenue increases you estimate you can achieve by adopting production resource-life extension practices.

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# RESULTS

HELPFUL TIP

To avoid confusion, carefully read each of the requirements in this section and note the distinction between a request for an ‘estimate’ (which is an informed prediction) and the actual ‘results’ your business has achieved (which can only be answered a year or so after the implementation of your ideas).

## TOTAL: waste-elimination estimates

### PLACE / PRODUCT / PRODUCTION

1) Questions 1 and 2 can only be answered a year or so after you implement the waste-elimination ideas and systems developed for the first workbook:

Create a graph similar to the one below and record the actual waste elimination data that your business has achieved in the Place, Product and Production categories (note: in the previous workbook you were asked to record estimates; here, you are being asked to record the actual results you have achieved to date). **If your business is part of the data display program, please update your waste elimination data section on the CIPS website.**

| Type of Waste | Unit of measurement | Total amount eliminated (by unit) annually |
|---|---|---|
| Liquid | | |
| | | |
| | | |
| Solid: | | |
| | | |
| | | |
| Gases: | | |
| | | |
| | | |
| Other: | | |
| | | |
| | | |

} Under each category (liquid, solid,etc) list the specific types of waste your business has eliminated annually

## TOTAL: achieved cost savings

### PLACE / PRODUCT / PRODUCTION)

2) Using the measurements above, record the *total* cost-savings that your business has actually attained by reducing waste in the Place, Product and Production categories.

### ESTIMATE: resource-life extension

3) From page 22, exercise 4, using Place, Product and Production as categories, estimate the percentage increase in material-life extension that your business believes it can achieve in 3 years, 5 years, and 10 years.

Create a fourth category, label it 'People'. Using the ideas you developed from page 16, exercise 4, estimate the percentage increase in overall repeat customers you expect to achieve annually.

Next, using your ideas from page 12, exercises 3, 4, and 5, estimate the overall percentage decrease you can reasonably expect to achieve annually in employee turnover.

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## TOTAL: estimated revenue enhancement

### TOTAL estimated revenue increases (PLACE / PRODUCT / PRODUCTION / PEOPLE)

4) Using the measurement systems you developed for this workbook, record the *total* percentage increases in revenues that your business estimates it can achieve annually by adopting the resource-life extension ideas developed from this workbook. Categorize the estimates by Place, Product, Production and People.

## TOTAL estimates vs. achievements: increases in productivity and revenues

5) The following questions can only be answered a year or so after you have implemented the resource-life extension ideas and systems developed herein:

- Have your waste-elimination and resource-life extension results produced overall increases in productivity and/or revenues? If so, display them in percentage form (e.g.: we achieved a 14% increase in production, which helped bring about a 7% increase in revenues, or, our employees decreased the time normally required to process order forms by 28%.... which translates to an increase in revenues of 3.5%).
- Display your previous estimates alongside the actual achievements of your business so they can be easily compared.

**If your business is part of the data display program, please update your waste elimination data section on the CIPS website.**

### TOTAL: job security and job creation

6) Have your efforts produced a general increase in job security (i.e.: has it saved any jobs and if so, how many?) and has it helped create jobs? Do you think they will do so in the future? Explain your answer.

HELPFUL TIP

To obtain on-going value from the waste elimination and resource-life extension programs, remember to look over the exercises in each workbook on a regular basis (perhaps every 3-6 months or so) and update your data collection records accordingly.

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# ABOUT THE AUTHORS

Jonathan T. Scott

(www.jonathantscott.com) is a lecturer, manager, entrepreneur, and business leader with over 25 years of work experience in eight different countries. As a manager he was recognized for tripling productivity, reducing costs by up to 40%, and increasing net profits by over 55%. In the process he conducted three separate turn-arounds (the first occurred in a war zone; the second was described as 'the best of its kind in the country') and pioneered multi-million dollar projects in diverse parts of the world. He is the founder and director of CIPS (*the Center for Industrial Productivity and Sustainability* (www.cipsfoundation.com) and *Wind Gateway* (www.windgateway.com) and has run a business-education firm since 2004. He also has taught at: the *Lorange Institute* (Zurich, Switzerland), *the Rotterdam School of Management* (Netherlands), the *Audencia Nantes School of Management* (Nantes, France), *Bradford University* (Bradford, UK), *Kozminski University* (Warsaw, Poland) and the *University of Perugia* (Italy). In 2009, he was presented with an 'outstanding achievements in teaching' award. Scott is the author of the following books (four of which are award-winning): **Fundamentals of Leisure Business Success** (1998), **The Concise Handbook of Management** (2005), **Managing the New Frontiers** (2008), **The Entrepreneur's Guide to Building a Successful Business** (2009), **The Sustainable Business** (2010 & 2013) and its workbooks, which have been translated into Chinese and Arabic, and **New Standards for Long-Term Business Survival** (2011). His specialty subjects include management, entrepreneurship, and sustainability.

Walter R. Stahel

(www.product-life.org) is a researcher, manager, teacher and entrepreneur who worked for many years as the head of Risk Management at the *Geneva Association* (Switzerland), the insurance industry's most prestigious research body. In addition, Stahel is a respected business advisor and the founder and director of the *Product-Life Institute* (Geneva, Switzerland), which is Europe's oldest sustainability-based consultancy and think-tank. Stahel's pioneering research and collaborative work in the field of sustainability stretch back several decades – firmly establishing him as one of the subject's founders. He is also a visiting professor at the Faculty of Engineering and Physical Sciences at the *University of Surrey* (UK) and was a regular guest lecturer (in the graduate department) at *Tohoku University* (Japan). An alumnus of ETH, *the Swiss Federal Institute of Technology* (Zurich, Switzerland), Stahel is the author of several prize-winning academic papers and pioneering books including ***The Limits to Certainty*** (1989/1993), written with Orio Giarini (published in six languages) and ***The Performance Economy*** (2010) published in English and Chinese.

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## Relevance. Reliability. Results

This is the companion text to *The Sustainable Business Workbook: Waste Elimination!*

Based on *The Performance Economy* (the seminal work that helped launch 'circular economics'), and with the specific intent of (1) saving your business money, (2) increasing its efficiency and competitiveness, and, (3) boosting its ability to profit from myriad worldwide future challenges, authors Jonathan T. Scott and Walter R. Stahel (with a total of over 40 years of experience working with students and businesses in dozens of countries), walk managers, employees and students through the beginning stages of the waste elimination process.

The aim is to help you transform your business into a performance-based power-house that optimizes resources, eliminates waste, and dramatically reduces future costs.

Whether you're a manager looking to build or strengthen the foundation of a results-oriented employee training program, or a business school administrator searching for an application-based program to add to your curriculum, ***The Sustainable Business Workbook: Resource-Life Extension***, and its accompanying texts ***The Sustainable Business*** and ***The Sustainable Business Workbook: Waste Elimination,*** is for you.

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