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Eco-Innovation Manual
Tools instructions

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Eco-Innovation Manual

Tools Instructions

ECO-INNOVATION MANUAL

TOOL INSTRUCTIONS

CONTENTS

ECO-INNOVATION TARGET IDENTIFICATION

Description: This tool is designed to support you in identifying companies that are more likely to be willing and able to benefit from eco-innovation services. The tool provides questions to guide your research analysis, starting at the industry sector level, before progressing through the market level, down to specific companies.

Who: This tool is intended for use by the Service Provider.

When: At the start of the PREPARE phase.

Inputs: List of the main industrial sectors and markets that SMEs in your country are involved in. Basic information about the characteristics of the main industry sectors, markets and companies operate in your country.

Outputs: A prioritized list of companies to target as prospects for eco-innovation implementation services.

Instructions

1. You should have already generated a list of the main industrial sectors and markets that SMEs in your country are involved in. If you have not yet done this, see section 1.2 of the manual for guidance on how to do this.

2. Begin by answering the questions in Section A. Sector-level analysis for each of the sectors in your list and add up the score out of 10 points.

3. Select the three highest scoring sectors and proceed to answering the questions in Section B. Market-level analysis. Add up the score for the market out of 10 points.

4. For the three selected markets, add the score from Section A to the score from Section B to give a combined score out of 20 points.

5. Select the sector/market that has the highest combined score and try to identify at least three SMEs in this market.

6. For each of the companies identified, proceed to answer the questions in Section C. Company-level analysis and add up the score out of 10 points.

7. This process should have identified and prioritized at least three companies that are good prospects for eco-innovation services. Refer to Section 1.3 of the manual for advice on how to generate interest at the company in your eco-innovation services.

N.B. The example provided below is for the Tasty Tuna Company case study, which is introduced in Section 1.3.4 of the manual.

A. Sector-level analysis

Sector name: Food processing

Score: 8/10

A1 – To what extent does the sector contribute to global greenhouse gas emissions and climate change (taking into account the full lifecycle of the product or service delivered by the sector)?

- ✔ Major contributor e.g. agriculture, chemicals, automotive, energy etc. **[2 points]**
- • Moderate contributor e.g. Insurance, banking, software etc. **[1 point]**
- • Contribution is negligible. **[0 points]**

A2 - To what extent does the sector contribute to global consumption of non-renewable resources (taking into account the full lifecycle of the product or service delivered by the sector)?

- ✔ Major contributor e.g. agriculture, chemicals, automotive, energy etc. **[2 points]**
- • Minor contributor e.g. Insurance, banking, software etc. **[1 point]**
- • Contribution is negligible. **[0 points]**

A3. To what extent does the sector contribute to global pollution problems (taking into account the full lifecycle of the product or service delivered by the sector)?

N.B. A 2012 report defined the 10 worst global pollution problems as follows:

10 worst global pollution problems in 2012 (Blacksmith Institute & UNIDO, 2012)	
Lead-Acid Battery Recycling	Industrial Estates
Lead Smelting	Artisanal Gold Mining
Mining and Ore Processing	Product Manufacturing
Tannery Operations	Chemical Manufacturing
Industrial/Municipal Dump Sites	Dye Industry

- Major contributor e.g. see list above. **[2 points]**
- ✔ Moderate contributor e.g. Insurance, banking, software etc. **[1 point]**
- Contribution is negligible. **[0 points]**

A4. To what extent does the sector contribute to global potable water consumption (taking into account the full lifecycle of the product or service delivered by the sector)?

- ✔ Major contributor e.g. agriculture, chemicals, pharmaceutical, energy etc. **[2 points]**
- Moderate contributor e.g. Insurance, banking, software etc. **[1 point]**
- Contribution is negligible. **[0 points]**

A5. To what extent has this sector been targeted by Non-Governmental Organizations (NGOs) to encourage improvements in sustainability performance?

- Major focus of sustained, global campaigns by NGOs. **[2 points]**
- ✔ Focus of occasional, local campaigns by NGOs. **[1 point]**
- No focus/attention from NGOs. **[0 points]**

B. Market-level analysis

Description of the market (e.g. business to business, automotive spare parts in Brazil): Canned tuna producers selling to domestic and international markets.

Score: 7 /10

B1. How strong is the growth of this market?

- Strong (>10% per year) **[2 points]**
- ✔ Moderate (5-10% per year) **[1 point]**
- Weak (<5% per year) **[0 points]**

B2. How strong is the competition in this market?

- ✔ Strong (6+ companies competing) **[2 points]**
- · Moderate (2-5 companies competing) **[1 point]**
- · Monopoly (1 company) **[0 points]**

B3. To what extent is the market adjusting to new or forthcoming legislation?

- · Major changes required to meet new or forthcoming legislative requirements **[2 points]**
- ✔ Moderate changes required to meet new or forthcoming legislative requirements **[1 point]**
- · No new or forthcoming legislation. **[0 points]**

B4. To what extent is government policy encouraging and supporting moves towards improved sustainability performance?

- · Major support from policy, including financial measures. **[2 points]**
- ✔ Moderate support from policy, but no financial measures. **[1 point]**
- · No support from policy. **[0 points]**

B5. How interested are the customers of this market in improved sustainability performance?

- ✔ Major interest – willing to switch products/suppliers or pay a premium for better sustainability performance. **[2 points]**
- · Moderate interest – information about sustainability performance is considered as part of the purchase decision, but not a deciding factor. **[1 point]**
- · No interest. **[0 points]**

C. Company-level analysis

Name of the company: Tast Tuna

CompanyScore: 5 /10

C1. To what extent is sustainability an explicit and public part of the core strategy and values of the company?

- · Major focus on sustainability – public statements or literature explicitly stating that sustainability is a core part of the company strategy and values. **[2 points]**
- ✔ Moderate focus on sustainability – sustainability not mentioned in company strategy or values but some evidence of interest in sustainability performance. **[1 point]**
- · No existing focus on sustainability. **[0 points]**

C2. To what extent is sustainability performance of the company's products and services part of their product marketing and positioning?

- · Major focus on sustainability – sustainability performance a major and consistent feature of the marketing and branding of the products and services of the company. **[2 points]**
- · Moderate focus on sustainability – sustainability performance a minor and occasional feature of the marketing and branding of the products and services of the company. **[1 point]**
- ✔ No existing focus on sustainability in marketing and positioning. **[0 points]**.

C3. What experience and capability does the company have in innovation?

- Significant experience and capability – frequent successful innovations, a formal process for turning good ideas into successful products/services and resources dedicated to supporting innovation (R&D team, innovation manager etc). **[2 points]**
- ✔ Moderate experience and capability – some notable innovations, but no resources dedicated to supporting innovation. **[1 point]**
- No experience or existing capability in innovation. **[0 points]**

C4. What experience and capability does the company have in managing environmental issues?

- Significant experience and capability – formal environmental management system in operation and resources dedicated to supporting environmental improvement (environmental manager etc). **[2 points]**
- ✔ Moderate experience and capability – some environmental management initiatives in operation but no resources dedicated to environmental improvement. **[1 point]**
- No experience or existing capability in managing environmental issues. **[0 points]**

C5. What is the position of the company in their market?

- ✔ Market leader. **[2 points]**
- Not the market leader. **[0 points]**

P E S
T E L

PESTEL

Description: Provides a simple framework to guide and structure your search for factors that may have an impact on the success and strategy of companies within a particular market.

Who: This tool is intended for use by the Service Provider.

When: During the PREPARE phase.

Inputs: A market for which you want to discover the key opportunities and challenges.

Outputs: Guidance on important areas to investigate for factors that may have an impact on the success and strategy of companies within a particular market. This can be used to create a structured list of challenges and opportunities for the market and can later be used again as a data source for the SWOT analysis.

Instructions

1. For your target market, try to identify issues or trends related to the following headings:

  • Political – Includes issues such as tax policy, labour law, environmental law, trade restrictions, tariffs, and political stability. Also relates to the governments influence in areas such as health, education, agriculture and the infrastructure of a nation. The political situation in regions that supply raw materials has been a hot topic because of the increased risk of supply disruption caused by political instability, conflict or political intervention. Sustainable government procurement opportunities is an important consideration for companies in relevant markets.

  • Economic – Refers to the general economic situation in the market e.g. economic growth, interest rates, exchange rates and the inflation rate.

  • Social – Relates to social trends, demographics and cultural aspects such as health consciousness, population growth rate, age distribution etc. More recently, social media has become a very influential factor in determining consumer attitudes and behaviour and is therefore an important consideration. Social problems and injustice (poverty, employment conditions, HIV/AIDS, lack of equal opportunities etc.) may represent significant opportunities for eco-innovation. Technological – Includes issues such as R&D activity, automation, technology incentives and the rate of technological change within a market.

  • Environmental – Can refer to issues such as the abundance of raw materials, eco-labelling practices, environmental policy and regulation, long-term risks from climate change (e.g. flooding, drought, sea-level rises). Along with social factors, environmental factors should be a key focus of a PESTEL analysis in the context of eco-innovation.

  • Legal – All types of legislation that may impact the market such as discrimination law, consumer law, antitrust law, employment law, and health and safety law.

N.B. There is inevitably some overlap between these headings (e.g. a new piece of environmental regulation could be included under the 'Political', 'Environmental' and 'Legal' headings), but the important thing is to ensure that all relevant issues have been captured.

2. Capture the issues and trends you have identified in the PESTEL template, provided below.

  • Capture details of the information source or an illustrative example of the trend, as this will be useful to provide credibility to your analysis when pitching to prospective clients.

  • Rate the importance and time scale of the issues and trends you have identified for your target market based on your own understanding of the issue.

Heading	Description of issue/trend	Source or example	Time scale (0-6/7-24/24+ months)	Impact(High/Medium/Low)
Political	EU Common Fisheries Policy imposing limits on catch.	EU: http://ec.europa.eu/fisheries/cfp/index_en.htm	7-24 months	High
Economic	International fishing companies obtaining licenses to fish in the region (who do not process their catch in the region where it is caught).	Greenpeace: http://www.greenpeace.org.uk/oceans/tuna	0-6 months	High
Social	Reports of slavery-like conditions on board tuna fishing vessels, with links to human trafficking.	Environmental Justice Foundation:http://ejfoundation.org/oceans/slaveryatsea	0-6 months	Medium
	Increasing consumer awareness of the unsustainable nature of current tuna fishing practices leading to consumer-led campaigns for improved sustainability practices within fishing and fish processing industry.	Fish Fight campaign:http://www.fishfight.net/	0-6 months	Medium
Technological	Increasing levels of automation helping to reduce production costs.	JBT FoodTech:https://www.youtube.com/watch?v=aIQRg0IWDSQ	0-6 months	Medium
Environmental	Concerns about overfishing and the impact of by-catch on the marine eco-system associated with purse seine and long line fishing methods	FAO report: http://www.fao.org/fishery/fishtech/40/en	0-6 months	High
	Plastic waste in oceans is accumulating in fish and causing increases in toxicity of fish products.	Montana State University: http://serc.carleton.edu/NAGTWorkshops/health/case_studies/plastics.html	24+ months	Medium
Legal	Some countries considering news laws to protect rights and welfare workers in the fishing industry.	Slave free seas:http://slavefreeseas.org/workspace/downloads/itf-28-march-2014.pdf	0-6 months	Medium

Example of a PESTEL matrix for the tuna processing industry.

LIFE CYCLE STAKEHOLDERS

Description: Used to help you identify all key stakeholders for the COMPANY and think about how they could contribute to eco-innovation activities.

Who: This tool is intended for use by the Service Provider.

When: During the PREPARE phase.

Inputs: List of stakeholders for the COMPANY.

Outputs: Suggestions for how stakeholders can contribute to the eco-innovation activities. This can be used to strengthen your pitch to relevant companies and can be used again when generating innovation ideas during the SET BUSINESS MODEL phase.

Instructions

1. Use the Life Cycle Stakeholders template to identify the key stakeholders for your Client and categorize them into the following categories:

   Supply chain - Stakeholders that provide goods and services to the company

   Customers - Stakeholders to whom we sell our goods and services.

   Professional interest - Stakeholders whose professional activities may bring them into contact with us or have an impact on us.

   Personal interest - Stakeholders who do not have a professional interest in our activities but may take a personal interest because our company has an impact on them in some way.

2. Generate ideas for how each of the stakeholders identified could potentially contribute to eco-innovation activities at the Client – capture these ideas on sticky notes and place them on the template next to the relevant stakeholder.
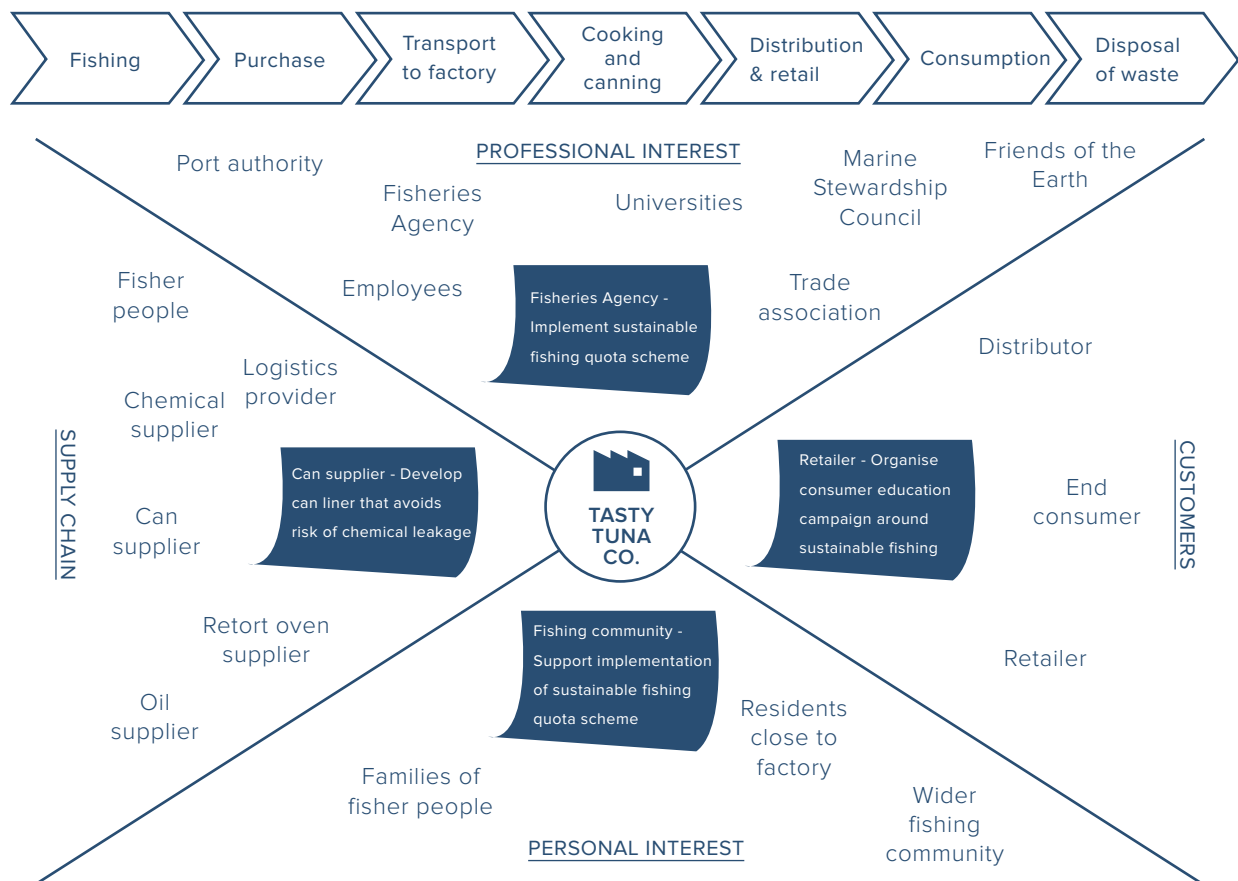
Example of the Life Cycle Stakeholder tool adapted and applied to the Tasty Tuna case study.

WALK-THROUGH AUDIT

Description: This guide can be used to help efficiently gather information when performing a walk-through audit.

Who: This tool is intended for use by the Service Provider.

When: During the SET STRATEGY phase.

Inputs: Generic and specific questions and guidance notes related to the different departments and parts of the company you may encounter during the tour.

Outputs: Basic data about the operational performance of the company that can be used as part of the Preliminary Assessment and as a data source for the SWOT analysis.

Instructions

1. Before the tour, read through the Walk-through Audit guide, provided in the templates section, and add some specific questions of your own that you would like to have answered.

2. During the tour, use the guide to prompt discussions and gather additional information.

3. After the tour, write down:

   - One thing you learnt from the tour that was new or unexpected.

   - At least one significant challenge or threat you have identified.

   - At least one significant opportunity you have identified.

BUSINESS MODEL CANVAS

Description: The business model canvas supports the business model innovation process by providing a simple, visual representation of a business model, consisting of 9 'building blocks' that describe the key features of how the business works. The business model canvas can also be used to capture details of the COMPANY's current business model. The focus of these instructions is on supporting the business model innovation process.

Who: This tool is intended for use by the Service Provider working alone or as a workshop exercise with two to six key representatives from the COMPANY company.

When: During the SET BUSINESS MODEL phase.

Inputs: Details of the business strategy as well as the sustainability threats and opportunities faced by the company.

Outputs: Alternative business model options that have a strong focus on improved sustainability performance.

Instructions

Participants and preparation

It is envisaged that the Business Model Canvas will normally be applied by the Service Provider working alone, but it can also be applied by a group in a workshop session in cases where this is feasible. The approach described below focuses on the use of the canvas in a workshop setting; applying the tool working alone will follow a similar process.

If organizing a workshop, it should involve personnel from across the different operational areas of the company (design, production, marketing etc). The participation of the CEO or senior management is not required. Aim for between 4 and 10 participants in the workshop from the company. The ideal group size will depend on the company, but in general – fewer than 4 can result in limited discussion and ideas. Conversely, more than 10 participants can make it difficult to remain focused (and will be very expensive for the company).

It can be useful to capture the results of applying the Business Model Canvas in an editable digital format for later review or revision. This can be done by recreating the canvas within a spreadsheet or presentation application. During the workshop it is best to use a large sheet of paper to capture the canvas so that everybody can participate freely. You can either write in the blocks directly or use sticky notes, the latter gives more freedom to move around/ remove/reuse items as the session progresses. You can still capture the results in a digital format after the workshop has finished.

Workshop process

Make sure you have prepared one or more canvasses and have sufficient pens and sticky notes etc. ready prior to the start of the workshop. The business model canvas template is available here: http://www.businessmodelgeneration.com/canvas

Introduce the session by explaining the purpose – to explore alternative business models that can support the eco-innovative business strategy that has been defined earlier in the programme.

Provide a recapitulation of the new business strategy for participants if they are not all familiar with it. You should also mention the list of important challenges and opportunities for the company identified in Section 2.3 of the manual and any significant issues identified through the In-depth Assessment and SWOT analysis.

To encourage consideration of the complete product life cycle it can be useful to review the results of the Life cycle Thinking exercise to highlight the major sustainability hotspots (plus any ideas that were generated during that activity).

Provide an overview of the Business Model Canvas and explain what needs to be captured within each of the building blocks. Show some examples of complete canvases, such as the one shown below. You may also choose to prepare a canvas to show the current business model of the company as you understand it. This will certainly be useful in aiding the participants in understanding how the Business Model Canvas works. However, when it comes to developing a new business model having a canvas showing the old business model in front of the participants may limit their ability to innovate if they become too focused on sticking closely to the existing business model. Hence if you do show an example of the current business model then be sure to put this away before you move on to the next step.

There are two approaches to developing an innovative new business model. One approach is to start by deciding on which of the building blocks you do not want to change due to particular constraints. For instance, if the company has recently made a large investment in a new production line, they are not likely to want to change that at this point. Alternatively, it could be that the company has a unique strength that is hard to replicate and should therefore be retained

in the new business model, such as a strong brand or a competency in mass customization. With the relevant building blocks 'frozen', the participants can then focus on the opportunities for innovation in the remaining building blocks.

The alternative approach is to try and generate a highly novel idea within one of the building blocks and then complete the rest of the canvas to support the novel proposal. This approach is relevant if you have taken the 'Bottom-up' approach to business model innovation (described in Section 3.2 of the manual) and have already generated ideas at the individual building block level.

Whichever approach you adopt, is it often easier to fill in the canvas by starting with the customer perspective (everything in the right half of the canvas) and work around to the 'back end' considerations (everything in the left half). The canvas also provides some prompting questions, which can be useful to promote more ideas if the level of discussion and the rate of progress begin to tail off.

If you are struggling to generate novel ideas, it can be worth introducing some of the business model innovation patterns described in Section 3.4 of the manual and asking the group how they could be applied in their company.

Once you have described one complete business model on the canvas, you should try to generate an alternative business model on a new canvas. Repeat this several times until you have a good variety of alternative business models.

N.B. The Business Model Canvas can be downloaded here: http://www.businessmodelgeneration.com/downloads/business_model_canvas_poster.pdf

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
Fishermen	Tuna procurement	**High quality canned tuna with long shelf life**	Telephone-based personal customer service	Local retailers
Mechanic (for vehicle maintenance)	Tuna processing			Wholesalers
Processing equipment suppliers	Distribution			International supermarket chains
	Key Resources		**Channels**	
	Experienced buyers		Sales force	
	Fast, efficient processing staff			
	Tuna processing facility			
	Fleet of vehicles			

Cost Structure	Revenue Streams
Tuna procurement	Sales of canned tuna
Vehicle fuel	
Labour	
Energy	

Example of the business model canvas for the Tasty Tuna case study
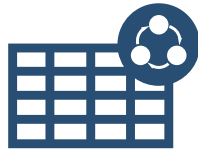
LIFE CYCLE THINKING

Description: This exercise helps you to build a better understanding of the major sustainability impacts of the COMPANY's products across their lifecycle and promotes thinking about the challenges and opportunities related to these impacts.

Who: This tool is intended for use by the Service Provider as a workshop exercise with 2-6 key representatives from the COMPANY.

When: During the SET STRATEGY phase. The Life Cycle Thinking template is also used in the In-Depth Assessment, and as part of the idea evaluation process during the SET BUSINESS MODEL phase.

Inputs: Examples of all the environmental, social and economic impacts that occur across the life cycle of the product.

Outputs: Identification of the sustainability hotspots that occur across the life cycle of the product.

1. Prior to the workshop you need to prepare a worksheet to capture the responses. A standard A1 size flipchart sheet is best as it provides sufficient space for a small group to work with. The worksheet needs to be split into 5 boxes, with titles as shown here:

Raw Materials	Production	Transportation	Use	End of Life

2. Introduce the exercise to the participants by explaining that a key aspect of eco-innovation involves considering the environmental impacts of a product across its lifecycle. Explain that this exercise is intended to capture the main sustainability issues that occur across the product lifecycle.

3. Starting with the 'Raw materials' box, ask the participants to provide examples of environmental, social and economic impacts that are associated with the extraction of raw materials and production of components that the company purchases.

4. Get the participants to make a note of any issues they suggest on a sticky note and place them in the relevant box of the product lifecycle.

5. After 5 minutes move on to the 'Production' box and complete the same activity. Repeat this process for each of the 5 phases of the product lifecycle.

6. Once you have completed all 5 boxes, convert the diagram into a matrix by adding rows with titles as shown in the example below.

7. Ask the participants to move the sticky notes they have created down to the appropriate cell of the matrix. For example, if the issue was 'Toxicity of cutting fluid during milling process', this note would be moved to the 'Health & Toxicity:Production' cell.

8. Where an issue sits across multiple cells, create copies of the note and place one in each of the relevant cells.

9. Once all the issues have been placed, you may wish to start gathering feedback from participants as their view of the most important sustainability impacts for the company as input to the *Sustainability Impacts Prioritisation* tool.

	Raw Materials	Production	Transportation	Use	End of Life
Material and water intensity	*Unsustainable fishing methods causing tuna stock depletion*	*Water consumption adding to stress on local water supplies*	*Concerns over leaching of heavy metals from damaged tin cans*	*Concerns over mercury content of tuna*	*No recycling infrastructure for tin cans available in local markets*
Energy intensity		High energy use in steam boilers			
Health & Toxicity		*Complaints from staff about lack of personal protective equipment*	*Concerns over leaching of heavy metals from damaged tin cans*	*Concerns over mercury content of tuna*	
Other social	*Reports of slavery-like conditions on board fishing vessels*	*Gender discrimination keeping women out of management roles*			
Profitability	*Rising cost of fresh tuna supplies*		*Increasing fuel costs for distribution*	*Lower retail prices achieved due to global recession*	
Job creation and security	*Fishermen leaving industry to seek higher wages*				

Example of a Life Cycle Thinking chart for the Tasty Tuna Company
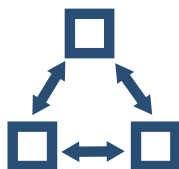
VALUE CHAIN PRESSURES

Description: This exercise is intended to determine the extent to which the COMPANY is currently helping or hindering the creation of a more sustainable value chain. It does this by asking for examples of sustainability-related actions requested of them by their customers and the actions that the COMPANY asks its suppliers to perform. The balance of these two sets of actions provides an indication of the net contribution the COMPANY has in creating pressure to improve sustainability performance in its value chain.

Who: This tool is intended for use by the Service Provider as a workshop exercise with 2-6 key representatives from the COMPANY company

When: During the SET STRATEGY phase.

Inputs: Examples of sustainability-related actions requested of them by their customers and the actions that the COMPANY asks its suppliers to perform

Outputs: Indication of the net contribution the COMPANY has in creating pressure to improve sustainability performance in its value chain, which can inform the SWOT analysis.

Instructions

1. Prior to the workshop you need to prepare a worksheet to capture the responses. A standard A1 size flipchart sheet is best as it provides sufficient space for a small group to work with. The worksheet should be split into two sections with headings and pictures to represent the customer, your Client, and suppliers – these can be customized for you Client. Below is an example of the worksheet for the Tasty Tuna Company. A template is provided in the supporting materials.

2. Introduce the exercise to the participants by explaining that the aim is to understand the role the company plays in promoting sustainability within its value chain.

EXAMPLES OF ENVIRONMENTAL ACTIONS ACROSS THE VALUE CHAIN
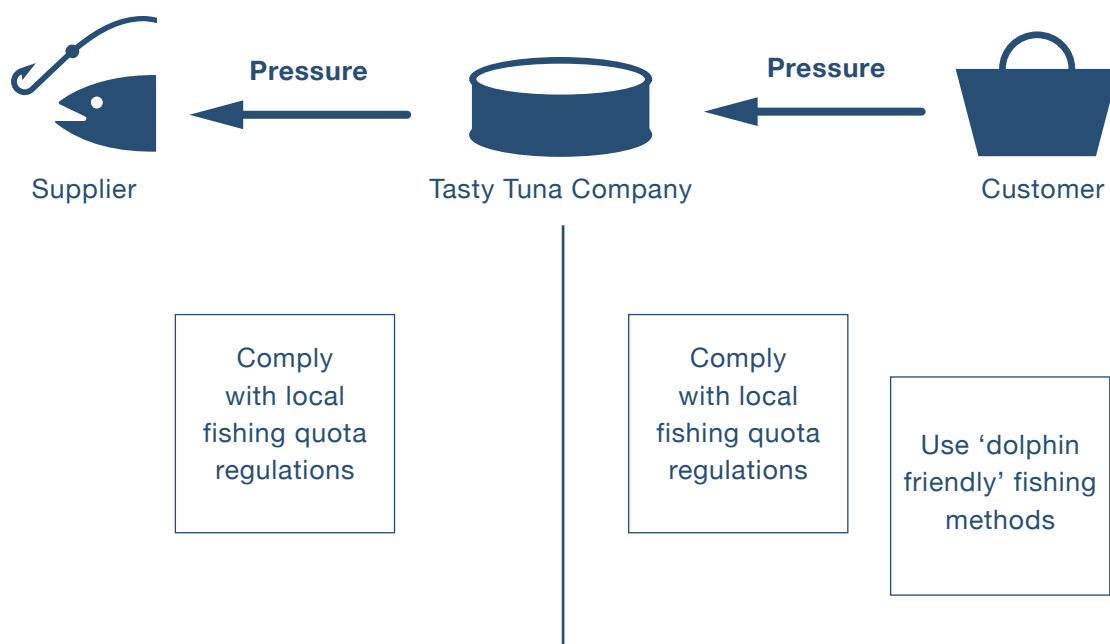
Figure 2-4. Value Chain Pressures tool

3. Starting in the right hand section of the worksheet, ask the participants to list the actions that the customer has asked them to complete to improve their sustainability performance. Make a note of the actions they have completed or started. Some generic prompts are provided below.

4. After 10 minutes, move on to the left hand section and ask the participants to list the actions that they have asked their suppliers to complete to improve their sustainability performance.

5. You can conclude the exercise by asking the participants to review the balance of the actions listed on the right and left sections of the worksheet and then comment on whether or not the company is currently helping or hindering the creation of a sustainable value chain.

Examples of actions that may be requested of value chain partners to improve your sustainability performance:

- Complete an environmental performance questionnaire.
- Report on their annual energy or water usage.

- Report on the hazardous substance content of your products.

- Provide a declaration of conformity with an environmental standard or regulation.

- Provide details of the recycled content included in their products.

- Report on their employee welfare policies.

- Participate in a Fair Trade scheme.

- Reduce the amount of packaging used to protect their products in transport.

- Redesign their packaging to include more units of product per container.

- Implement an environmental management system.
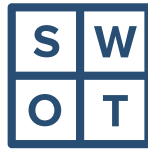
SWOT

Description: SWOT is a strategic analysis tool that aims to identify the factors that originate within the company (strengths and weaknesses) as well as those that originate in the external environment (opportunities and threats) that could have a significant influence on the choice of business strategy.

Who: This tool is intended for use by the Service Provider working alone.

When: During the SET STRATEGY phase.

Inputs: Information about significant strategic issues facing the company.

Outputs: Categorized set of strategic factors to support strategy development.

Instructions

1. Begin by identifying all the significant strategic factors that you have noted from your work with the company to date. The sources of information that can be used for this include:

    -   *Internal origin –*
        -   Walk-Through Audit
        -   Interview with CEO
        -   Current business model
        -   Life Cycle Thinkin

    -   *External origin –*
        -   Desk research
        -   Life Cycle Stakeholders
        -   Interview with CEO
        -   Life Cycle Thinking
        -   Value Chain Pressures

2. Include a bullet point summary of each significant strategic factor in the relevant cell of the matrix. An example for the Tasty Tuna Company is provided below.

3. The final step is to prioritise the issues that you have identified. There is no simple procedure for prioritizing the factors, but you should aim to compile a list of the top five helpful factors (opportunities or strengths) and the top five harmful factors (weaknesses or threats). The prioritised factors will be used in the strategy formulation, described in Section 2.3 of the manual.

	Helpful to becoming more sustainable	**Harmful** to becoming more sustainable
Internal origin (attributes of the company)	# STRENGTHS Well-optimised manual processing of tuna thanks to skilled, loyal workforce.Effective, innovative and adaptable sales and marketing team.	# WEAKNESSES No internal capacity for packaging material innovation.Low profit margins means little financial capital for investment.Production Manager due to retire in one year.Lots of female workers but none in Senior Management Team.
External origin (attributes of the environment)	# OPPORTUNITIES Some markets interested in sustainably sourced fish.Good relationship with fishermen could be used to encourage more sustainable fishing methods.	# THREATS Significant fish loss and waste between point of catch and point of consumption.Over-fishing and marine eco-system damage becoming an internationally important issue. Unsustainable fishing methods causing tuna stock depletionCompetition from rival tuna processers driving down profit margins.Reports of slavery-like conditions on board some tuna fishing vessels that belong to our suppliers. Rumours that new policy will ban certain unsustainable fishing methods.

SWOT matrix example for The Tasty Tuna Company

FORCE FIELD ANALYSIS

Description: This tool provides a structured approach to analyzing the factors that are likely to make implementing a change easier, and the factors that will create resistance to the change.

Who: This tool is intended for use by the Service Provider as a workshop exercise with two to six key representatives from the COMPANY.

When: During the SET STRATEGY phase.

Inputs: A proposal for a significant change for the business strategy.

Outputs: An assessment of the drivers and barriers for the proposed change and suggestions for how to make the conditions more favourable for the change. This can be used to inform actions to make the changes introduced through the eco-innovation programme easier to implement.

Instructions

1. Prior to the workshop you need to prepare a worksheet to capture the responses. A standard A1 size flipchart sheet is best as it provides sufficient space for a small group to work with. The worksheet needs to be split into sides with three sections entitled 'People', 'Processes' and 'Context' - an example is shown below.

2. Introduce the session by explaining that the aim is to identify the factors within the company that are supporting the implementation of eco-innovation activities and those that may be cause resistance.

3. Begin by asking the group to define exactly what the change is that they hope to implement.

4. Split the group into two teams. Ask the first team to consider the three headings and then list suggestions for factors that will support the proposed change. Ask the second team to do the same but list the factors that may cause resistance.

5. After around 30 minutes, ask the group to assign a score to each of the factors they have listed (one being a minor impact on the proposed change; five being likely to have a major impact).

6. Each team should then present their results to the other team.

7. Pick out the barriers with the highest scores and ask both teams if they can think of ways to address that issue and lower the score.

8. Then pick out one or two drivers with low to moderate scores and ask both teams if they can think of ways to strengthen that driver.

9. If by the end of this activity the sum of the drivers is greater than the sum of the barriers, the proposed change will enjoy favourable conditions, increasing its chances of succeeding. If the barriers outweigh the drivers, the planned change may have to undergo significant revision, or even be abandoned, as it will be unlikely to succeed.

| Drivers | ➡️ | STRENGTH | STRENGTH | ⬅️ | Barriers |

Drivers →		STRENGTH	STRENGTH	← Barriers	
People	Fishermen aware of risk of overfishing.	1	5	Lack of Senior Management Team commitment to reducing environmental impacts.	People
	Small network of staff that have personal interest in sustainability issues.	1	2	Perception that company's products do not have a significant negative environmental impact.	
Process			42	Absence of sustainability criteria in customer procurement specifications.No documented policy on sustainability management.	Process
Context	Fisheries Ministry implementing policy to reduce by-catch.	2			Context
	Growing interest from retailers in supporting a can recycling service.	1			
	Total FOR change	5	13	Total AGAINST change	

Example of a Force-Field Analysis diagram for the Tasty Tuna case study.

IN-DEPTH ASSESSMENT

Description: A set of questions covering the key aspects of the company that help the Service Provider to understand the current situation for the company, the opportunities for eco-innovation and how the situation may evolve in the future. This information can be used to help inform the development of the business model and any gaps that might exist between the desired business model and the current operational performance.

Who: This tool is for use by the Service Provider.

When: During the SET BUSINESS MODEL phase.

Inputs: Wide variety of data and information about the company, covering each of the building blocks of the business model canvas

Outputs: Holistic understanding of the company's current situation and the opportunities for eco-innovation, which is used to inform the business model innovation activity.

Instructions

1. The starting point for the data collection activity is the *Life Cycle Thinking* tool template, which focuses on the data and facts related to the situation at the Client company today. Below this template is shown with examples of the type of data that should be collected across each of the phases of the product life cycle.

2. The template should be reviewed and adapted where necessary depending on the nature of your Client's business and the feasibility of collecting the necessary data.

3. Plan your data collection activities by identifying the potential sources of the data you require and the time scales required to collect the data.

4. As well as the data collection activities related to the *Life Cycle Thinking* tool template you should aim to capture more qualitative data about each of the building blocks of the business model canvas. A number of suggested questions are provided below which aim to build a more holistic understanding of the business model and the key factors and trends that influence each building block.

5. Once you have completed the data collection activities you should analyse the data and present the results of your analysis in a short report to your Client.

Customer Segments

- What is the approximate size of the market that the company sells its products into?
- What is the company's share of this market?
    - Is this market growing or declining? By what percentage per year?
    - What factors might drive growth in the current markets in the future?
- Why would customers choose the products of the company over those of a competitor?
- What government policy, legislation or standards are currently influencing the main Customer Segments the Client operates in?
    - Is this likely to change in the future?
    - If so, how?
- Are customers concerned about the environmental or social impacts of the company's products or operations?
    - If so, which impacts and why?
    - What action(s) have they requested?
- Do customers perceive the company to have any positive social or environmental impacts?
    - If so, what are they?
- What new technologies are influencing the main Customer Segments the Client operates in?
- What cultural or demographic changes are occurring in the main Customer Segments the Client operates in?
- What other Customer Segments could the Client target?

Value Proposition

- What is the customer need that the product satisfies?
- What level of influence does the company have over the products it sells? (100% control/in-house design vs manufactures according to customer specification).

- What research and development capacity does the company have to support the development of new products?

- Has the company implemented a Design for Sustainability process?

- What are the main environmental and social impacts of the company's products across their lifecycle (based on results of *Life Cycle Thinking* data collection)?

  - In what phase do these main impacts occur?

  - What influence does the company have over these impacts?

Channels

- How do potential customers become aware of the Client's products?

- What are the main sources of pre-sales information the Client provides to potential customers?

- How to customers purchase products from the Client?

- How are products delivered to the customer (based on results of Life Cycle Thinking data collection)?

- What after-sales support is provided by the Client to the customer and how is this provided?

Customer Relationships

- How does the Client manage the relationships it has with each of its Customer Segments?

- Are there any customer communities that the Client is, or should be, interacting with?

Revenue Streams

- What are the main revenue streams for the company (based on results of Life Cycle Thinking data collection)?

- What is the margin on current product sales?

- How stable are revenue streams?

  - Stable throughout the year?

  - Vary from season to season in a predictable manner?

  - Vary in an unpredictable way?

Key Resources

- What intellectual resources are important to the company? E.g. patents, production process know-how etc.

- What human resources are important to the company? E.g. Experienced fish buyers, skilful production operatives etc.

- Is the company able to access funds available for investment?

  - If so, is this existing capital or a loan?

  - How much is available?

  - What is the cost of capital?

Key Activities

- Is the company collecting and using data to analyse the performance of its production processes in terms of:

  - Energy consumption

- Water consumption

- Resource efficiency

- Waste management

- Management of chemicals

- Health and safety

- Has the company implemented a Resource Efficient and Cleaner Production process or Environmental Management System (EMS)?

- Has the company implemented a Health and Safety management system?

  - What steps has the company taken to promote good worker health, worker well-being and industrial relations?

  - Does the company make use of new technology to help monitor, analyse and improve the performance of its production processes?

  - How does the efficiency and cost-effectiveness of the company's production processes compare with competitors or industry benchmarks?

- What actions has the company taken to improve the working conditions and welfare of its employees?

  - Does the company take environmental or social sustainability considerations into account in procurement activities?

  - Does the company make use of new technology to improve the performance of its operations?

Key Partnerships

- How many suppliers does the Client deal with?

- What influence does the company have with its suppliers (on price, ways of working etc)?

- What actions has the company taken to improve the sustainability performance of its suppliers (based on results of Value Chain Pressures tool)?

- What other partners does the company work with?

  - What does the Client gain from working with these partners?

  - What new partners could the Client work with?

- Are stakeholders concerned about the environmental or social impacts of the company's products or operations?

  - If so, which impacts and why?

  - What action(s) have they requested?

- Do stakeholders perceive the company to have any positive social or environmental impacts?

  - If so, what are they?

Cost Structure

- What are the main sources of cost for the company (based on results of Life Cycle Thinking data collection)? (e.g. staff wages, material costs, energy bills, rent etc.)

- Is the cost structure dominated by fixed or variable costs?

- What economies of scale or scope benefits does the Client achieve?

	Raw Materials	Production
Materialsand water intensity	Inventory of materials purchased including quantities	Inventory of material waste in production including quantities. Water consumption data. Emissions governed by permits or regulations?
Energy intensity	Data on energy consumption for production and delivery of materials.	Production energy consumption with breakdown by process. Energy consumption in heating/cooling and lighting of production facilities and offices.
Health & Toxicity	Do suppliers have:Health & Safety management system in operation?Chemical management system in operation?Can suppliers demonstrate compliance with relevant health, safety and chemical regulations or standards?	Does Client have:Health & Safety management system in operation? Chemical management system in operation?Is Client compliant with relevant health, safety and chemical regulations or standards?
Other social	Do suppliers have:Policy on child labour?Policy on equal opportunities and discrimination?Policy on working hours?	Does Client have:Policy on child labour?Policy on equal opportunities and discrimination?Policy on working hours?Staff development and training?Complaints from local community regarding noise and pollution from production operations?
Profitability	Cost of materials purchased.	Cost of waste and emissions.Cost of energy use in production.Cost of social impacts?
Job creation and security	Are jobs in the supply chain permanent, full-time and secure? What are the prospects for job creation?	Are jobs in the Client permanent, full-time and secure? What are the prospects for job creation?

	Transportation	Use	End of Life
Materials and water intensity	Inventory of packaging materials including quantities. Inventory of product waste during transportation including quantities.	Inventory of product returns from retailer/ customer including quantitiesAvailability of repair or maintenance services?	Data on typical end of life fate for product.
Energy intensity	Data on energy consumed in warehouse or retail location.Data on fuel consumption for product transportation.	Data on energy consumption of product during use phase. Availability of guidance for user on energy-efficient use of product?	Data on energy consumption of product during end of life phase.
Health & Toxicity	Guidance for workers on safe handling of product.	Guidance for user on safe use of product.	Guidance for user/ workers on safe product disposal practices.Risk of hazardous waste emissions from end of life product?
Other social	Complaints from local community regarding noise and pollution from transportation operations?	Evidence of social benefits of use of product? E.g. job creation, improved health etc.	Complaints from local community regarding pollution from end of life disposal?
Profitability	Cost of warehouse operation.Cost of transportation operations. Product sales revenues including breakdown by product line.	Revenues from maintenance services or consumables.	Cost of end of life processing.Revenues from end of life processing.
Job creation and security	Are jobs in the logistics provider permanent, full-time and secure? What are the prospects for job creation?	What are the prospects for job creation in maintenance, support and service?	What are the prospects for job creation in recycling and reverse logistics?

Example of Life Cycle Thinking tool template

Management considerations

- Does the company have culture that supports innovation?
- What experience does the company have of managing radical innovation projects?
- What is it that the company does that is difficult for competitors to replicate?
- In what areas do competitors have a competitive advantage over the company?

9 WINDOWS ON THE WORLD

Description: This tool provides a structured approach to analyzing problems and generating new solution concepts. By forcing participants to think about the problem from different perspectives, it can provide new insights into the root cause of the problem — leading to novel solution concepts.

Who: This tool is intended for use by the Service Provider as a workshop exercise with two to six key representatives from the COMPANY.

When: During the SET BUSINESS MODEL phase to generate product ideas and during the IMPLEMENT phase to help solve problems.

Inputs: A specific sustainability problem or inefficiency that you would like to address.

Outputs: Innovation ideas to address an identified sustainability problem.

Instructions

Problem analysis

1. Prior to the workshop you need to prepare a worksheet to capture the responses. A standard A1 size flipchart sheet is best as it provides sufficient space for a small group to work with. The worksheet needs to be split into nine 'windows', with titles as shown here:
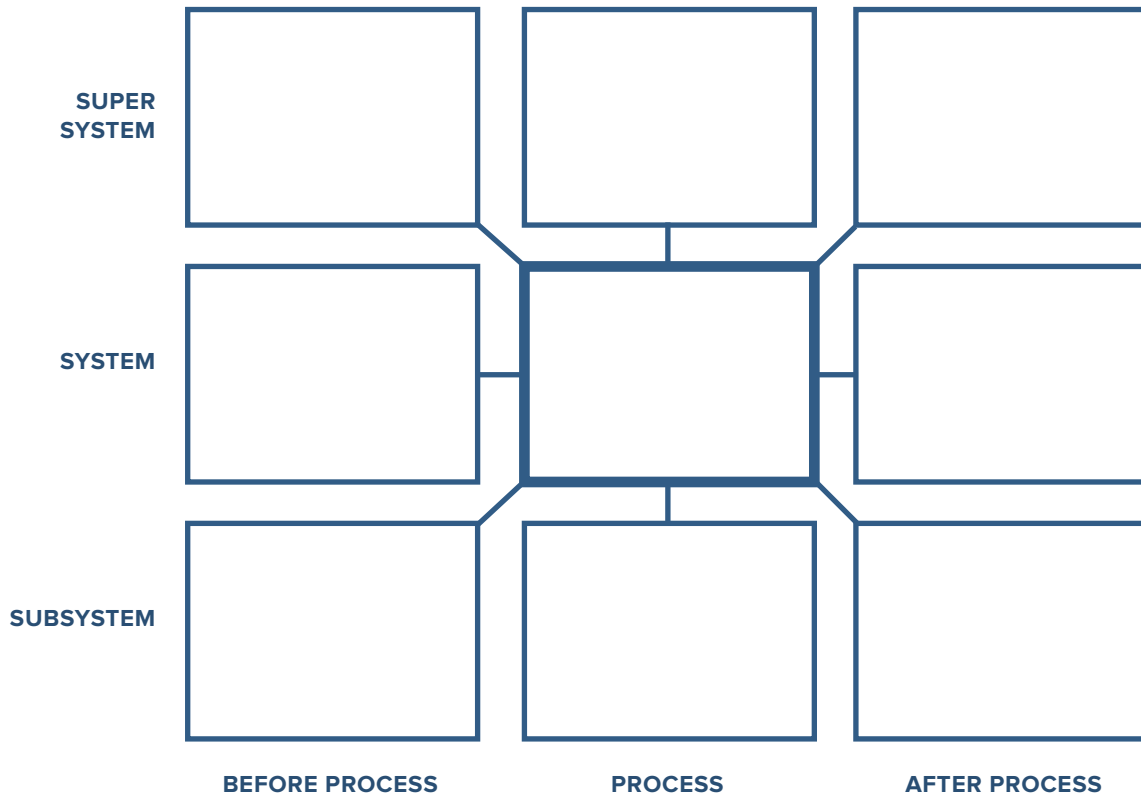
2. Ask the group to write a statement describing the sustainability problem in the centre window i.e. "High energy use in tuna cooking".

3. Ask the group to define time and system axes – What is the sub-system and super-system of the system you are considering? What time scales are you considering?

4. Fill-in the eight remaining windows with processes, functions or behaviours that contribute to the central problem.

Idea generation

5. Select two to three contributing issues and write them on a separate sheet.

6. Brainstorm solution concepts to address the contributing issues you have identified.

7. Setting a target for the number of ideas generated in a time-limited period can help to expand the range of ideas suggested e.g. "Generate 20 ideas in 20 minutes".

8. Ask the group to select their 3 best ideas to take forward for evaluation.

	BEFORE PROCESS	PROCESS	AFTER PROCESS
SUPER SYSTEM	Tuna not thawed adequately prior to cooking	Cooking time not optimized for each batch	Undercooked tuna requires further cooking time
SYSTEM Steam cooker machine	Lack of boiler maintenance reduces efficiency	**High energy use in tuna cooking**	Heat from steam wasted
SUBSYSTEM	Metal cages not designed with cooking energy use in mind	Damaged seals allowed leakage of steam	No steam auto switch-off when cooker door opened

BEFORE PROCESS   **PROCESS**   **AFTER PROCESS**

Tuna pre-cooking process

Example of 9 Windows on the World tool for high energy use in tuna cooking.

SUSTAINABLE FINAL RESULT

Description: This tool encourages participants to describe a solution that has all of the desired benefits of the original product and none of the unsustainable aspects, without worrying about the feasibility of creating such a solution. By starting at this ideal (but unreachable) state, participants can then take small steps back until they reach a more feasible solution idea.

Who: This tool is intended for use by the Service Provider as a workshop exercise with two to six key representatives from the COMPANY.

When: During the SET BUSINESS MODEL phase, when searching for innovation ideas.

**Inputs:** A product-related sustainability problem or inefficiency that you would like to address.

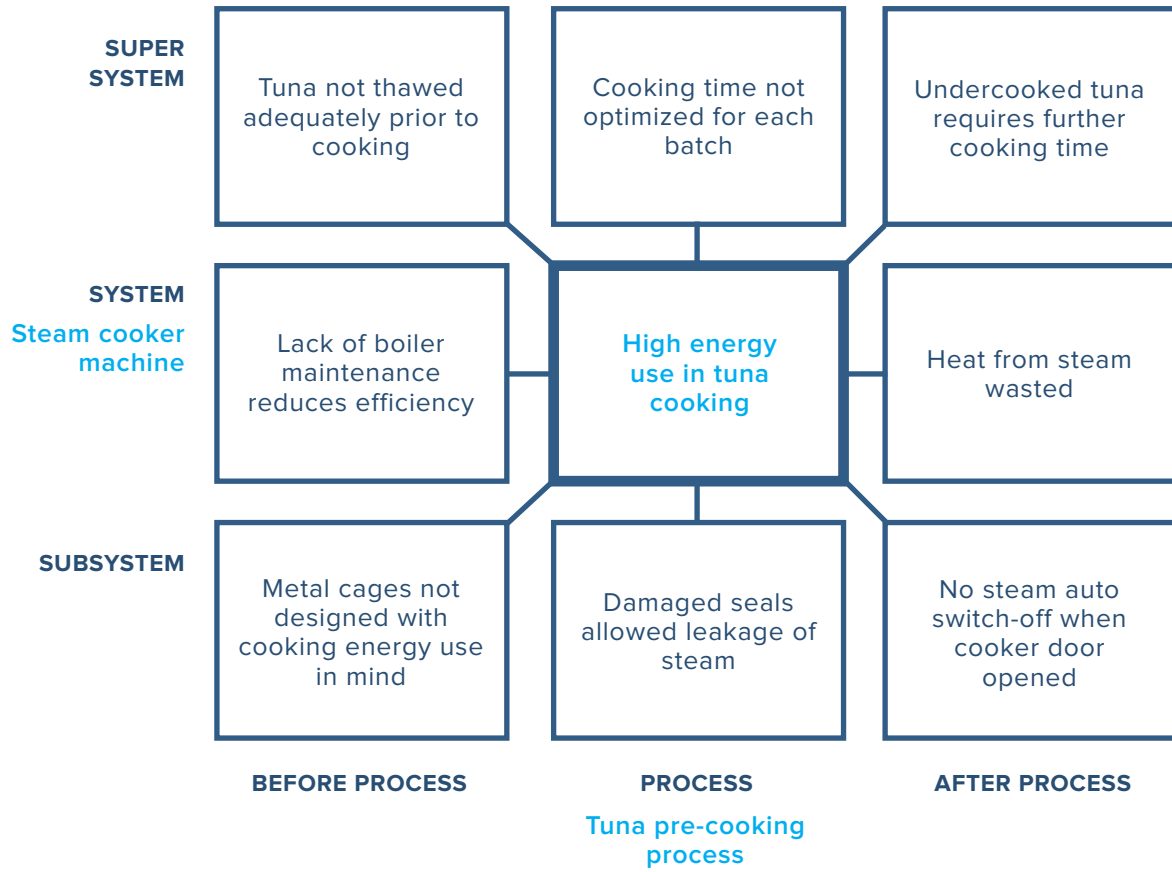**Outputs:** Innovation ideas to address an identified sustainability problem.

Instructions

1. For the issue you have chosen, spend 5 minutes brainstorming why the current practice is unsustainable.

2. Work through the S*tructured Thinking Questions* below to define your Sustainable Final Result.

3. Work through the S*tructured Thinking Questions* again and try to generate an alternative Sustainable Final Result. Repeat this step a third time.

4. Now imagine that it is 20 years from now and you have created the Sustainable Final Result that you have outlined. How did it happen?

   - List the **major events** and **milestones** that happened along the way

   - List the **stakeholders** and think about how they are affected – who would win, who would lose?

   - Who would be critical to the success of the project?

   - Who could stop the project?

5. Finally, what would be your top 3 recommendations for the senior management team to help the company move towards realizing the Sustainable Final Result?

Example: Structured thinking questions for fisherman that want to eliminate by-catch

- What is the ideal final result?

  - Fisherman has large catch of 100% mature tuna.

- What are the obstacles to this?

  - Other types of fish and immature fish are caught in the fishing nets.

- Why or how does this interfere?

  - Other fish take up space in the nets and take time to throw-back manually.

- Under what conditions would the interference disappear?

  - If only mature tuna were caught in the nets.

  - If other species and immature could be sorted and removed automatically.

- What resources are available to create these conditions?

  - Tuna farming?

  - Various types of sorting machines exist?

- Has anyone else been able to solve this problem?

  - Recycling equipment producers have solved the general problem of quickly identifying and sorting things (in their case, different types of polymer) by using Near Infrared Spectroscopy technology.
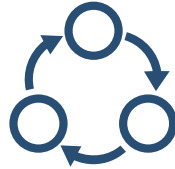
PRODUCT IDEA PROMPTS

Description: Simple list of prompts that encourage the user to consider the full life cycle of the product when generating ideas for now product concepts. Its primary use is within a workshop activity, where it can be used in conjunction with other tools to help promote new lines of thinking.

Who: This tool is intended for use by the Service Provider as a workshop exercise with two to six key representatives from the Client company.

When: During the SET BUSINESS MODEL phase, when searching for new concept product concept ideas.

Inputs: A product-related sustainability problem or inefficiency that you would like to address.

Outputs: New ideas for ways to address the sustainability problem.

Instructions

1. Use the Product Idea Prompts tool when you an idea generation workshop and want to encourage new ideas or new lines of thinking. It can be particularly effective to introduce the tool when the group has already spent some time thinking about the problem or challenge you have set them, have generated a first batch of ideas but the rate of new idea generation has slowed down.

2. Explain to the group that the tool is a simple set of prompts which complement the idea generation process by providing new inspiration and encouraging thinking about the whole product life cycle.

3. Share the tool in a presentation slide or as a large printout. Read out each of the titles and each of the prompts. Allow some thinking time after each group of prompts to allow participants to discuss new ideas.

New Concepts
- Dematerialise
- Increase shared use
- Provide a service

Manufacture
- Alternative production techniques
- Reduce number of components
- Fewer production techniques
- Less waste production

Materials
- Reduce quantity of materials
- Cleaner material
- Renewable material
- Lower energy-content material
- Recycled/Recyclable materials

Distribution
- Less/cleaner/reusable packaging
- Energy-efficient transport and logistics

Usage
- Lower energy consumption
- Renewable energy
- Reduce use of consumable
- Cleaner consumables

End-of-life
- Product or component re-use
- Design for disassembly / recycling / reconditioning

Durability
- Integrate product functions
- Easy maintenance and repair
- Modular product structure

Manufacture
Distribution
Raw materials
Recycle
Disposal
Use
End-of-life

Example of a Product Idea Prompt.
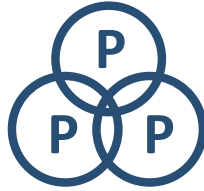
PEOPLE PLANET PROFIT

Description: The People Planet Profit Diagram is used to generate ideas for new products and services or ways of marketing those products by describing the requirements of each of the three main stakeholders and then thinking about how the changes that would be necessary to the system to make conflicting or contradictory requirements become more aligned.

Who: This tool is intended for use by the Service Provider as a workshop exercise with two to six key representatives from the COMPANY.

When: During the SET BUSINESS MODEL phase.

Inputs: A set of requirements for an existing product or service.

Outputs: Innovation ideas that benefit people, the planet and are profitable for the company that can be used to define a new value proposition for an eco-innovative business model.

Instructions

1. Introduce the session by explaining that the People Planet Profit (PPP) Diagram is used to identify opportunities for product innovation that will result in benefits for 'people' (i.e. the customer or society), 'planet' (i.e. the natural environment), and 'profit' (i.e. the manufacturer).

2. For an existing product or service, list the main requirements on sticky notes – one requirement per sticky note.

3. Draw three very large overlapping circles on an A1 flipchart sheet or whiteboard and label them 'People', 'Planet' and 'Profit', as per the example below.

4. Ask the participants to position the sticky notes they have created on the PPP Diagram according to which of the three stakeholders the fulfilment of that requirement will benefit. Requirements that benefit all three stakeholders are placed in the centre of the diagram and are referred to here as 'tri-synergies'.

5. Once all the requirements have been placed on the diagram, try to generate new eco-innovation product and marketing ideas by considering:

   • Have existing tri-synergies been fully exploited?

   • What could you change to create new tri-synergies?

   • Where are the major conflicts?

6. Setting a target for the number of ideas generated in a time-limited period can help to expand the range of ideas suggested e.g. "Generate 20 ideas in 20 minutes".

7. End the session by asking the participants to decide on what they believe to be the top three ideas from the session that should be considered for implementation.
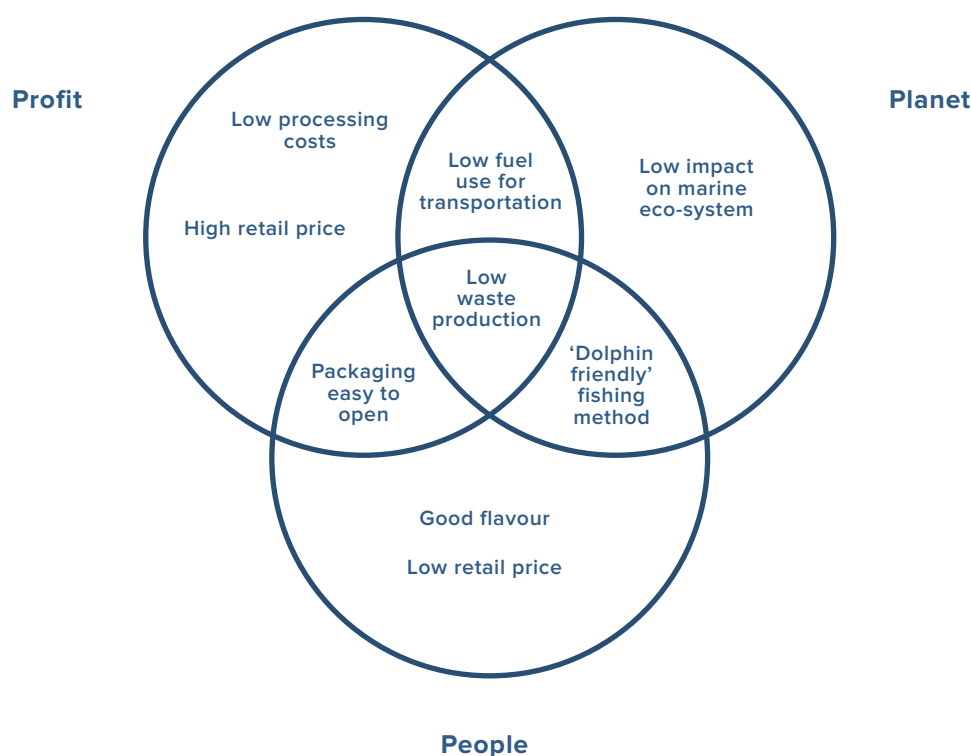
Figure 3-8. Example of a People Planet Profit Diagram for 'Canned tuna' product

RISK REGISTER

Description: This tool provides a structured approach to anticipating and prioritizing all possible risks connected with an eco-innovation business model or project proposal eco-innovation project in hand. Furthermore the tool helps the user to define preventive and corrective actions, where necessary.

Who: This tool is intended for use by the Service Provider as a workshop exercise with two to six key representatives from the COMPANY.
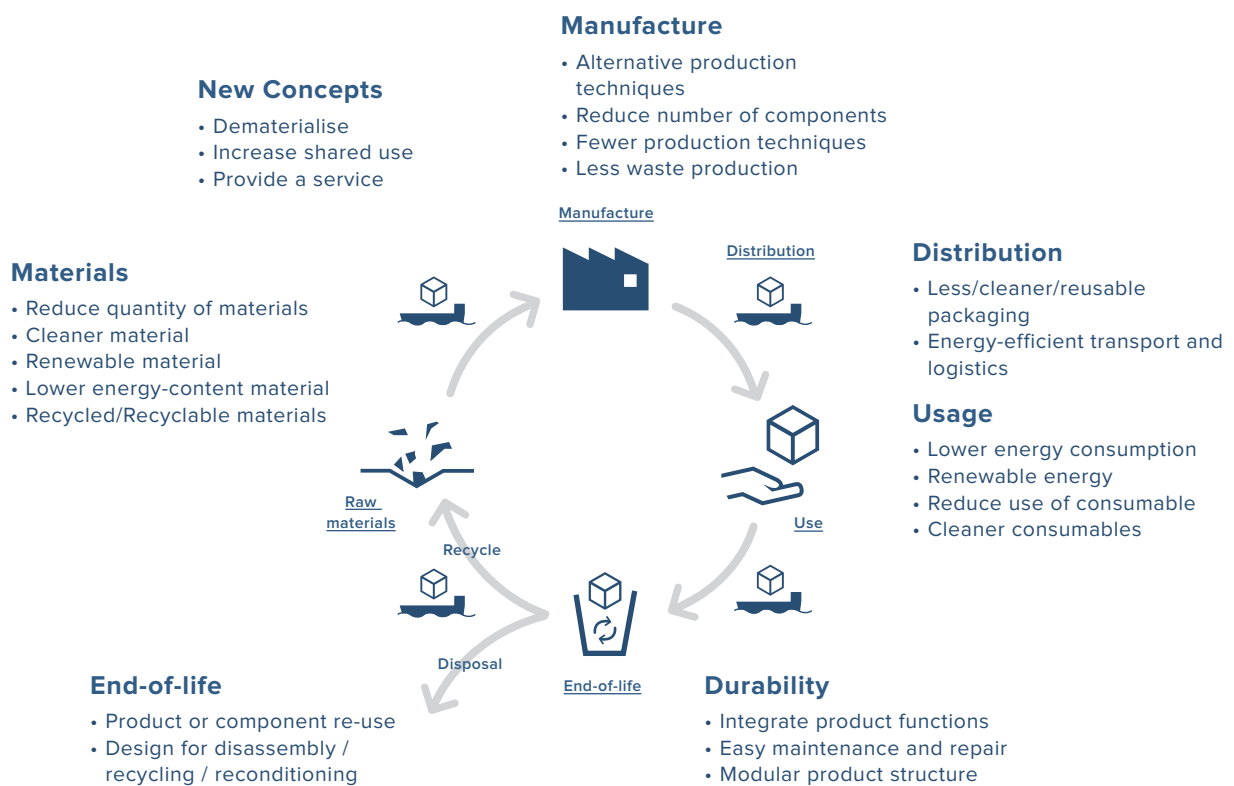
When: During the set SET BUSINESS MODEL phase to identify and evaluate the risks associated with a business model proposal, and during the IMPLEMENT phase to help manage risks within the implementation of a project.

Inputs: An eco-innovation business model or project proposal that has been chosen for implementation.

Outputs: A prioritized list of risks along with mitigation options that can be used to identify and evaluate the risks associated with a business model proposal or help manage risks within the implementation of a project for eco-innovation.

Instructions

Preparation

1. Identify a group of insightful and experienced people from the Client company, who have prior experience of projects within the company, both from a technology and a commercial viewpoint.

2. Together with the group, gather a gross list of risks connected to the project upon which you are working. This list can be generated from a combination of sources, such as prior experience, own scepticism, or the result of a structured brainstorm.

Execution of tool

3. Take the Risk Register template and begin filling in the fields – one row per identified risk. An explanation of each field in the template is provided below and is accompanied by an example.

   - **Risk code:** This simply helps the project manager to keep track of each risk and creates a reference to check performance against.

   - **Risk name:** The risk is described in this field – only one risk per entry.

   - **Risk category:** A category list can be defined, so as to facilitate an easy organization of the risks for the company. The categories could relate to the product life cycle, company departments, or a complete other set of categories.

   - **Probability (1-3):** Enter a simple score, showing 1 for a low likelihood of the risk materializing into an actual problem, 3 for a high likelihood.

   - **Impact (1-3):** Evaluate the potential negative impact on the project and/or company, from 1 to low negative impact to 3, for high negative impact.

   - **Risk score:** Multiply the probability score with the impact score, to attain a risk score. This score should help the Client company to prioritize their efforts.

   - **Mitigation:** Write here a consideration of how which measures could (and probably will) be taken to stop the risk from materializing.

   - **Contingency:** Prepare for worst-case by preparing a contingency plan, in case the risk does manifest itself as an actual problem.

   - **Action date:** Record when it is decided to take action

Action by: Record who is responsible for mitigating each risk.

Risk Register for Tasty Tuna Company								
Risk code and name	Impact description	Probability (1-3)	Impact (1-3)	Risk score	Mitigation	Contingency	Action date	Action by
Risk 01 Tuna caught illegally	Product removed from market. Loss of reputation Fine of imprisonment Loss of key suppliers	2	3	6	Work with licensed fishing companies and ask to see evidence of quota compliance.	Work with a variety of fishing companies, at least for first 2 years	14/01/15	Mr. Tasty
Risk 02 Fisherman not willing to join cooperative	Loss of revenue Loss of key suppliers	1	3	3	Hold meeting with senior fishermen to explain risk of business as usual approach and benefits of cooperative model.	Continue to offer current transactional business model during transition period to maintain revenue if uptakes is slow.	22/02/15	Mrs. Tuna
Risk 03 Customer rejects product	Poor product sales	1	2	9	Carefully planned marketing campain	Prepare a list of FAQ's and answer all possible questions from customer's well in advance	23/06/15	Mr. Tasty
Risk 04 Customer misunderstands the project as green-washing	Poor product sales Loss of reputation	2	3	6	Consider creating a parallel brand for the product, so as not to confuse or endanger the existing brand.	Be prepared with detailed environmental product declarations beforehand	14/06/15	Mrs. Tuna

Figure 3-12. Example of the Risk Register completed for the Tasty Tuna case study.

BUSINESS MODEL EVALUATION

Description: This tool is intended to assist in the selection of a new business model by providing a summary of key evaluation metrics for all the business model options being considered.

Who: This tool is intended for use by the Service Provider.

When: During the SET BUSINESS MODEL phase.

Inputs: Data concerning the benefits, costs and risks of implementing each of the new business model options.

Outputs: A relative scoring of each of the business model options against a variety of indicators of the benefits, costs and risks of implementing each of the new business model options that can be used as part of the business model evaluation process.

Instructions

1. Prior to applying the business model evaluation matrix you should have completed the steps detailed in Section 3.6.1 of the manual for gathering data on the benefits, costs and risks for each of the business model options e.g. used Life Cycle Thinking matrix to assess the benefits, used the Business Model Canvas to assess the costs and implementation effort, and used the Risk Register to assess the risks.

2. Begin by scoring the benefits of each of the business model options, relative to the current situation, using the following scoring scale:

   0 – Option is more than 100% worse than the current situation.

   1 – Option worse is than the current situation.

   2 – Option is broadly the same as the current situation.

   3 – Option is better than the current situation.

   4 – Option is more than 50% better than the current situation.

   5 – Option is more than 75% better than the current situation.

3. Using the results of the *Risk Register,* assess the long term risk using the same scoring scale, then assess the implementation risk on a scale of high, medium or low; were 'high' risk would mean a high probability of failure in the implementation of the new business model and serious negative consequences of failure.

4. For the cost indicators, use any data you have compiled on the investment costs to state an estimate of the upfront capital investment required to implement the new business model. Use the results of the implementation effort evaluation to score the implementation effort on a scale of high, medium or low; were 'high' effort would mean a significant proportion of company personnel involved in the implementation over an extended period of time.

5. The completed matrix can be used to support the selection of the final business model option to take forward, see Section 3.6.2 for further details.

	Metric	Current situation	Option 1	Option 2	Option 3
BENEFITS	Energy intensity	2	3	5	3
	Material and water intensity	2	4	4	3
	Human health and toxicity	2	2	1	2
	Other social issues	2	2	2	3
	Profitability	2	3	4	3
	Job creation and security	2	1	2	2
RISKS	Long term risk (after mitigation actions and successful implementation)	2	4	4	3
	Implementation risk (High/Medium/Low)	(None)	Medium	High	Low
COSTS	Upfront capital investment (state cost estimate)	(None)	€ 15,000	€ 74,000	€ 3,000
	Implementation effort (High/Medium/Low)	(None)	Medium	High	Low

Example of the Business Model Evaluation tool completed for the Tasty Tuna Company.
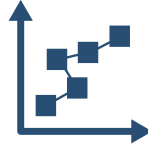
ROADMAP

Description: The Roadmap tool is used to evaluate the key innovations that will be required to achieve the desired business model and strategy in terms of key issues such as capital investment, effort and risk. This evaluation can then be used to build a logical sequence of projects, progressing the COMPANY towards accomplishing its strategic goals for eco-innovation.

Who: This tool is intended for use by the Service Provider as a workshop exercise with representatives from the Senior Management Team at the COMPANY.

When: During the BUILD ROADMAP phase.

Inputs: A set of innovation ideas that contribute towards the overall implementation of a new business model and the strategic goals.

Outputs: A roadmap of innovations that contribute towards the overall implementation of the chosen new business model and the strategic goals.
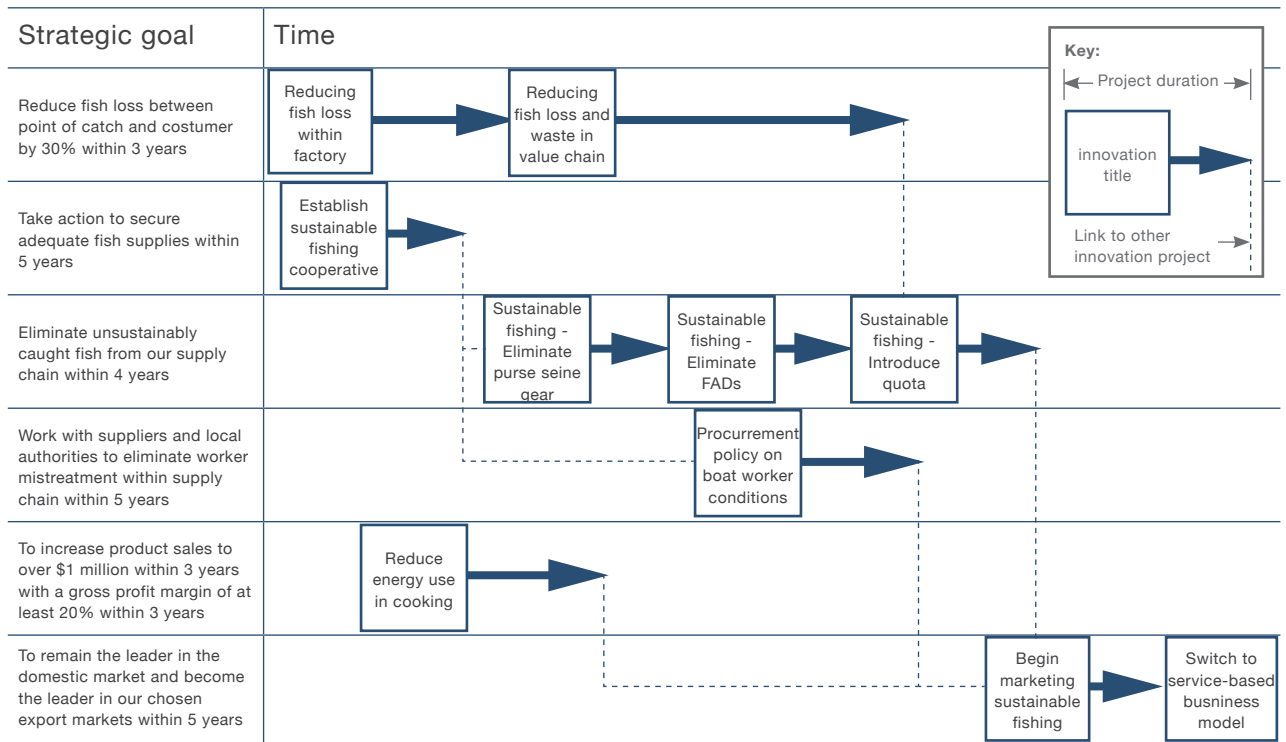
Instructions

1. For your chosen business model, you should have a number of innovations outlined that will be necessary to complete in order to implement the business model. For each of the innovations fill out a row within the Roadmap Development Matrix against the following headings:

    *   **Innovation title:** Descriptive title for the innovation.

    *   **Benefits:** Brief description of the business benefits that can be realized once this innovation has been implemented (e.g. cost saving, comply with legislative requirement, increase product sales, improved market understanding etc.). Some innovations may not deliver any immediate business benefit as they are a stepping stone towards the implementation of the complete business model.

    *   **Capital investment:** Upfront financial investment required to complete the innovation.

    *   **Implementation effort:** Estimate of the person months of work required to implement the innovation.

    *   **Implementation risk:** The probability of the innovation failing and the impact of such a failure on the company.

    *   **Scheduling considerations:** Prerequisites for the innovation, the availability of personnel or partners, and any external deadlines (e.g. new legislation compliance deadline) should be captured in this column.

2. Review the Roadmap Development Matrix and try to develop a logical sequence in which to approach the innovation activities, keeping in mind the following considerations:

    *   Start by analyzing the pre-requisites for each innovation, as these are often non-negotiable.

    *   Innovations that deliver immediate benefits, particularly cost-savings, should be implemented sooner than those that do not deliver immediate benefits.

    *   Low-cost, low risk innovations can be good starting points for companies that are new to eco-innovation.

    *   Innovations that impact on the 'customer facing' (right) half of the business model canvas may be considered inherently higher risk than those that impact on the 'back end'(left) half of the canvas.

    *   Where an innovation will require input from specialist personnel or external partners, the availability of the necessary personnel/partner may dictate when the innovation is implemented.

3. Use the logical sequence you have developed for the innovations, build a roadmap diagram which shows the relationship between strategic goals and innovations as well as the sequencing and estimated duration of the innovation project, following the example provided below.

4. Further advice on selecting and defining the scope of the first project is provided in Section 4.3 of the manual.

Innovation title	Benefits	Capital investment	Implementation effort	Implementation risk (High/ Medium/Low)	Scheduling considerations
Procurement policy on working conditions on tuna fishing vessels	Immediate reduction in brand damage risk	€0	6 person months	Medium	Need to establish sustainably fishing cooperative first.
Reduce fish loss in factory	Immediate cost saving (approx. €32,000/ year)	€2,500	2 person months	Low	None
Marketing campaign to launch sustainably sourced fish product	Increased product sales	€21,000			Need to complete all sustainable fishing projects first.
Establish sustainable fishing cooperative	Stepping stone to sustainable fishing	€4,000	6 person months (over 24 months)	High	None
Sustainable fishing – Eliminate purse seine and long line gear	Stepping stone to sustainable fishing	€15,000	4 person months (over 12 months)	Medium	Need to establish sustainably fishing cooperative first.
Sustainable fishing – Eliminate Fish Aggregation Devices	Stepping stone to sustainable fishing	€500	4 person months (over 12 months)	Low	Need to establish sustainably fishing cooperative first.

| Sustainable fishing – Introduce quota | Stepping stone to sustainable fishing | €4,000 | 8 person months (over 18 months) | High | Need to establish sustainably fishing cooperative first.Need to agree timescales with cooperative fishermen |
| Reduce energy in tuna cooking | Immediate cost saving (approx. €11,000/ year) | €4,000 | 4 person months | Low | None |

Example of the Roadmap Development Matrix for the Tasty Tuna case study

Strategic goal	Time
Reduce fish loss between point of catch and costumer by 30% within 3 years	Reducing fish loss within factory → Reducing fish loss and waste in value chain
Take action to secure adequate fish supplies within 5 years	Establish sustainable fishing cooperative
Eliminate unsustainably caught fish from our supply chain within 4 years	Sustainable fishing - Eliminate purse seine gear → Sustainable fishing - Eliminate FADs → Sustainable fishing - Introduce quota
Work with suppliers and local authorities to eliminate worker mistreatment within supply chain within 5 years	Procurrement policy on boat worker conditions
To increase product sales to over $1 million within 3 years with a gross profit margin of at least 20% within 3 years	Reduce energy use in cooking
To remain the leader in the domestic market and become the leader in our chosen export markets within 5 years	Begin marketing sustainable fishing → Switch to service-based busniness model

Key:
|← Project duration →|
innovation title →
Link to other innovation project →

Example of a strategic roadmap for the Tasty Tuna case study.

REQUIREMENTS SPECIFICATION

Description: This tool is used to capture the decisions about the technical requirements of the innovation idea being implemented. The purpose of the requirements specification is to define the basic characteristics and properties of the innovation idea in a structured and solution-neutral format.

Who: This tool is intended for use by the Service Provider together with the project team from the COMPANY.

When: During the IMPLEMENT phase.

Inputs: An eco-innovation project that has been chosen for implementation.

Outputs: A completed requirements specification for the technical elements in the innovation idea.

Instructions

1. Gather the project management group from the Client company, ready to carry out this exercise.

2. Together with the group, work through the life cycle of the emerging project, pointing out key areas for environmental focus. Record each are for focus in a list.

3. Take the Requirements Specification Template and begin filling in the fields – one row per identified risk. An explanation of each field in the template is provided in the following, also accompanied by an example.

    *   **Number or code:** This simply helps the project manager to keep track of each requirement and creates a reference to check performance against.

    *   **Mandatory requirement:** This field is where the requirement is described. Take care to fill in the requirements by stating "what" but _not_ "how" each requirement should perform. Describing the "what" sets a measurable target for the project, whereas describing "how" (even though tempting) may limit the solution space and cut out valuable innovation opportunities.

    *   **Comments:** This field leaves room for members of the project to remind themselves of reasons for including the requirement, general questions about the technological elements of the solution, recommendations from other colleagues or similar projects, etc.

    *   **Priority:** This field helps to communicate the relative importance of various parameters of the solution.

        *   M - MUST have this.

        *   S - SHOULD have this if at all possible.

        *   C - COULD have this if it does not affect anything else.

        *   W - WON'T have this time but would like in the future

    *   **Review date:** This field helps to keep track of the date for review of each parameter.

    *   **Reviewed/Approved:** This field allows for the assigned reviewer and/or approver to sign off each requirement.

Requirements specification for: Tasty Tuna Company
Water usage reduction project 01

Number or code	Requirement	Comments	Priority (MSCW)	Review date	Review/Approved
Req. 01	Reduce water consumption in thawing process to 3m3 per tonne of processed fish	Lorenzo method of thawing proven to achieve this level of water saving performance	S	01/02/15	Mr. Tasty
Req. 02	Eliminate water usage in filleting operation	'Filleting includes all processes from end of thawing to start of cannin process	M	31/03/15	Mrs. Tuna
Req. 03	Capture >80% of solid organic waste from filleting operation for reprocessing	Market has been identified for use of entrails and fish scraps in fishermeal products	S	15/06/15	Mr. Tasty
Req. 04	Compatible with product output of at least 275kg/hour		M	14/02/15	Mrs. Tuna
Req. 05	Cleaning requirement of less than 0.5 person hours per 8 hour shift	Relates to the cleaning of the water saving equiment installed (if any), not the cleaning of the fish product	S	01/02/15	Mrs. Tuna
Req. 06	Maintenance requirement of than 0.5 person hours per week	Maintenance to undertaken by unskilled operative	M	14/02/15	Mr. Tasty

Figure 4-4 - Sample Requirements Specification.

TOOL TEMPLATES

ECO-INNOVATION TARGET IDENTIFICATION

PESTEL

LIFE CYCLE STAKEHOLDERS

WALK-THROUGH AUDIT

LIFE CYCLE THINKING

SWOT

FORCE FIELD ANALYSIS

9 WINDOWS ON THE WORLD

SUSTAINABLE FINAL RESULT

PRODUCT IDEA PROMPTS

RISK REGISTER

BUSINESS MODEL EVALUATION

REQUIREMENT SPECIFICATION

PEOPLE PLANET PROFIT

A. Sector-level analysis

Sector name: _____

Score: __/10

A1 – To what extent does the sector contribute to global greenhouse gas emissions and climate change (taking into account the full lifecycle of the product or service delivered by the sector)?

- Major contributor e.g. agriculture, chemicals, automotive, energy etc. **[2 points]**
- Moderate contributor e.g. Insurance, banking, software etc. **[1 point]**
- Contribution is negligible. **[0 points]**

A2 - To what extent does the sector contribute to global consumption of non-renewable resources (taking into account the full lifecycle of the product or service delivered by the sector)?

- Major contributor e.g. agriculture, chemicals, automotive, energy etc. **[2 points]**
- Minor contributor e.g. Insurance, banking, software etc. **[1 point]**
- Contribution is negligible. **[0 points]**

A3. To what extent does the sector contribute to global pollution problems (taking into account the full lifecycle of the product or service delivered by the sector)?

N.B. A 2012 report defined the 10 worst global pollution problems as follows:

10 worst global pollution problems in 2012 (Blacksmith Institute & UNIDO, 2012)	
Lead-Acid Battery Recycling	Industrial Estates
Lead Smelting	Artisanal Gold Mining
Mining and Ore Processing	Product Manufacturing
Tannery Operations	Chemical Manufacturing
Industrial/Municipal Dump Sites	Dye Industry

- Major contributor e.g. see list above. **[2 points]**
- Moderate contributor e.g. Insurance, banking, software etc. **[1 point]**
- Contribution is negligible. **[0 points]**

A4. To what extent does the sector contribute to global potable water consumption (taking into account the full lifecycle of the product or service delivered by the sector)?

- Major contributor e.g. agriculture, chemicals, pharmaceutical, energy etc. **[2 points]**
- Moderate contributor e.g. Insurance, banking, software etc. **[1 point]**
- Contribution is negligible. **[0 points]**

A5. To what extent has this sector been targeted by Non-Governmental Organizations (NGOs) to encourage improvements in sustainability performance?

- Major focus of sustained, global campaigns by NGOs. **[2 points]**
- Focus of occasional, local campaigns by NGOs. **[1 point]**
- No focus/attention from NGOs. **[0 points]**

B. Market-level analysis

Description of the market (e.g. business to business, automotive spare parts in Brazil):

Score: __ /10

B1. How strong is the growth of this market?

- Strong (>10% per year) **[2 points]**
- Moderate (5-10% per year) **[1 point]**
- Weak (<5% per year) **[0 points]**

B2. How strong is the competition in this market?

- Strong (6+ companies competing) **[2 points]**
- Moderate (2-5 companies competing) **[1 point]**
- Monopoly (1 company) **[0 points]**

B3. To what extent is the market adjusting to new or forthcoming legislation?

- Major changes required to meet new or forthcoming legislative requirements **[2 points]**
- Moderate changes required to meet new or forthcoming legislative requirements **[1 point]**
- No new or forthcoming legislation. **[0 points]**

B4. To what extent is government policy encouraging and supporting moves towards improved sustainability performance?

- Major support from policy, including financial measures. **[2 points]**
- Moderate support from policy, but no financial measures. **[1 point]**
- No support from policy. **[0 points]**

B5. How interested are the customers of this market in improved sustainability performance?

- Major interest – willing to switch products/suppliers or pay a premium for better sustainability performance. **[2 points]**
- Moderate interest – information about sustainability performance is considered as part of the purchase decision, but not a deciding factor. **[1 point]**
- No interest. **[0 points]**

C. Company-level analysis

Name of the company: _____

CompanyScore: __ /10

C1. To what extent is sustainability an explicit and public part of the core strategy and values of the company?

- Major focus on sustainability – public statements or literature explicitly stating that sustainability is a core part of the company strategy and values. **[2 points]**

- Moderate focus on sustainability – sustainability not mentioned in company strategy or values but some evidence of interest in sustainability performance. **[1 point]**

- No existing focus on sustainability. **[0 points]**

C2. To what extent is sustainability performance of the company's products and services part of their product marketing and positioning?

- Major focus on sustainability – sustainability performance a major and consistent feature of the marketing and branding of the products and services of the company. **[2 points]**

- Moderate focus on sustainability – sustainability performance a minor and occasional feature of the marketing and branding of the products and services of the company. **[1 point]**

- No existing focus on sustainability in marketing and positioning. **[0 points]**.

C3. What experience and capability does the company have in innovation?

- Significant experience and capability – frequent successful innovations, a formal process for turning good ideas into successful products/services and resources dedicated to supporting innovation (R&D team, innovation manager etc). **[2 points]**

- Moderate experience and capability – some notable innovations, but no resources dedicated to supporting innovation. **[1 point]**

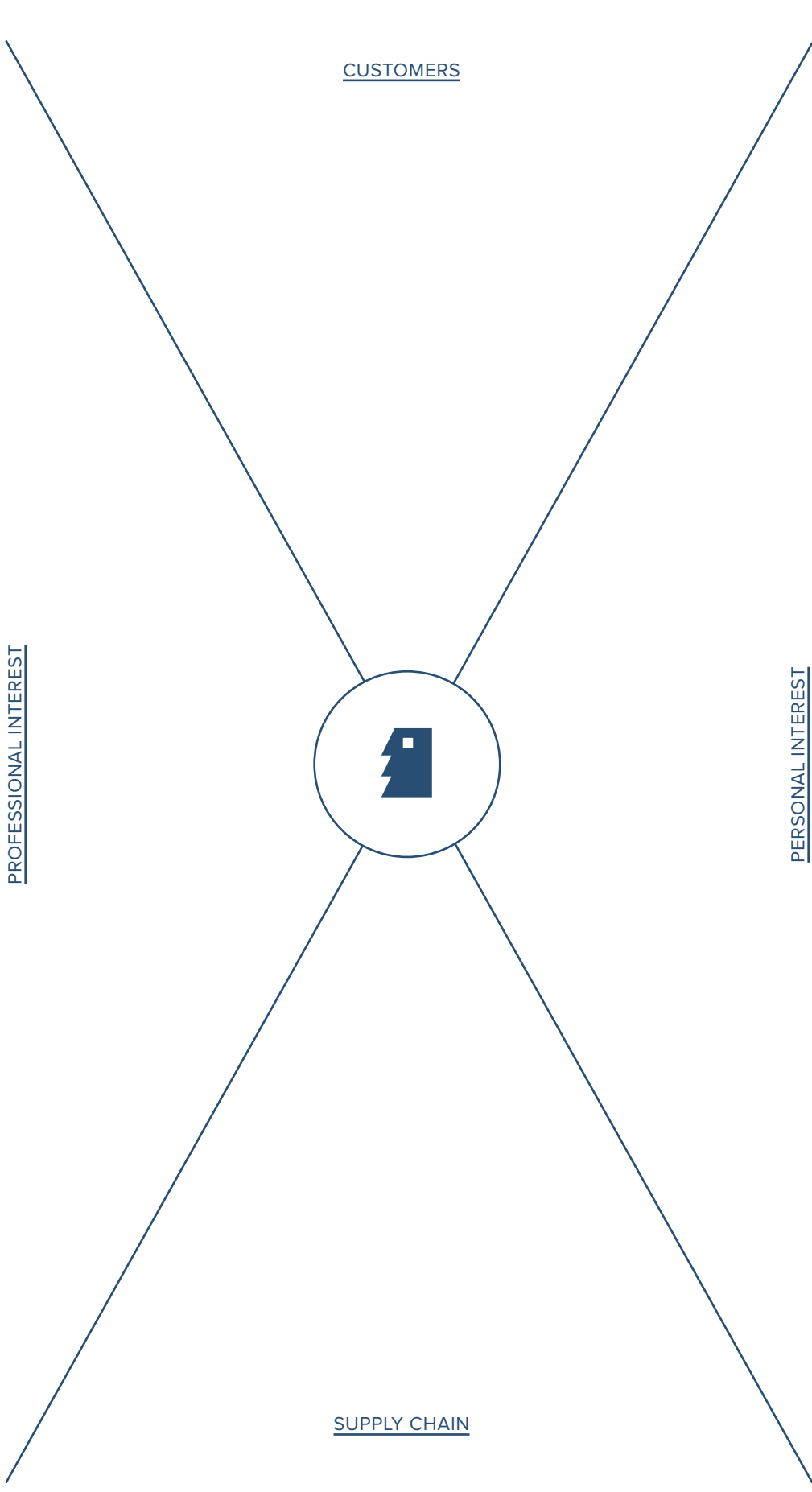- No experience or existing capability in innovation. **[0 points]**

C4. What experience and capability does the company have in managing environmental issues?

- Significant experience and capability – formal environmental management system in operation and resources dedicated to supporting environmental improvement (environmental manager etc). **[2 points]**

- Moderate experience and capability – some environmental management initiatives in operation but no resources dedicated to environmental improvement. **[1 point]**

- No experience or existing capability in managing environmental issues. **[0 points]**

C5. What is the position of the company in their market?

- Market leader. **[2 points]**

- Not the market leader. **[0 points]**

Heading	Description of issue/trend	Source or example	Time scale (0-6/7-24/24+ months)	Impact(High/ Medium/Low)
Political e.g. tax policy, labour law, environmental law, trade restrictions…				
Economic e.g. economic growth, interest rates, exchange rates, inflation…				
Social e.g. population growht rate, poverty, employment conditions…				
Technological e.g.R&D activity, automation, technology incentives, rate of technology change…				
Environmental e.g. eco-labelling, climate change risks, raw material abundance…				
Legal e.g. discrimination law, consumer law, health and safety law…				

Life Cycle Stakeholders

Version:

Date:

CUSTOMERS

PROFESSIONAL INTEREST

PERSONAL INTEREST

SUPPLY CHAIN

END OF LIFE

USE

DISTRIBUTION

PRODUCTION

TRANSPORT TO FACTORY

MATERIALS / COMPONENTS PRODUCTIONS

RAW MATERIALS EXTRACTION

Getting started on the tour	• Ask to be shown round the production facilities in a logical flow, from 'Goods in', round each step of the processing, through to 'Goods out'. • How many people work for the company? • What was the turnover of the company last year? • Is the company growing (revenue and staff numbers)? • Other questions:
Production - Goods in	• What are the main types of delivery you receive? • Do you have a quality control system to inspect goods as they arrive? • Do you ever have problems with poor quality goods? • Other questions:
Production – Main processes	• Capturing a simple schematic diagram of the main process steps as you tour the production facilities can help to ensure you fully understand the complete process and identify any process steps you may have not been shown. • Look for instances of waste (materials, energy, water, time)Which of the production process steps use the most materials/energy/ water/chemicals? • Which parts of the production process are the most problematic? • What are the main contributors to production costs? • Other questions:

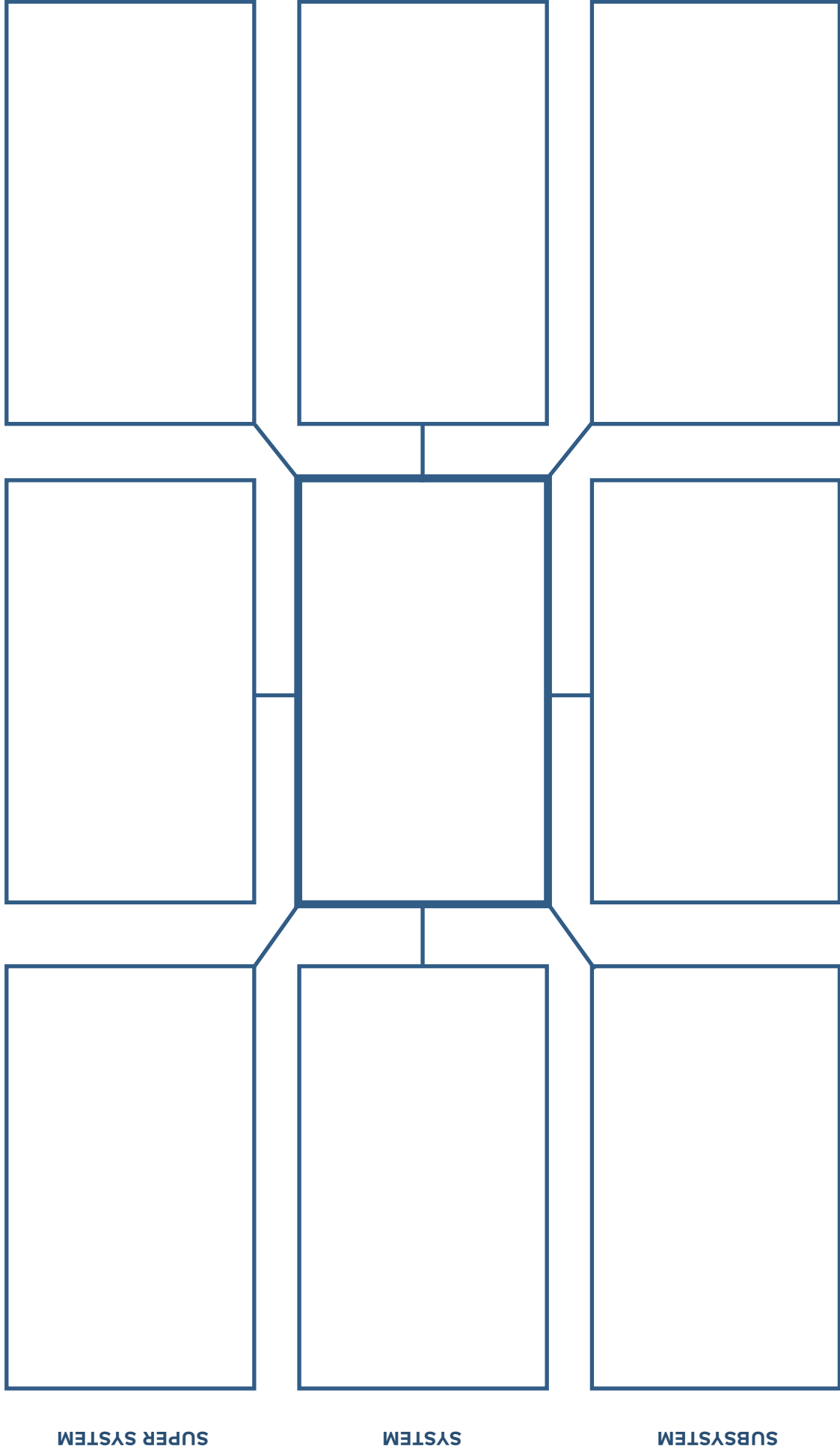|	
Production - Goods out	• What happens to the product between leaving here and arriving at the end user? • What means of transport are used? • Does the company have its own distribution system or does it rely on a third party provider? • Other questions:
Sales & Marketing	• Which are the most important product lines and markets for the company? • How are the key product lines performing at the moment? • Who are the most important customers within those markets? • How do you market and sell your products? • Other questions:
Design & Engineering	• Do you design your own products or manufacture to your customer's specification? • Do you have Research & Development facilities on-site? • Do you take sustainability issues into account when designing new products? • Other questions:
Purchasing	• Who are the most important suppliers for the company? • Are there any problems with these suppliers at the moment? • Is sustainability performance a consideration in your purchasing decisions? • Other questions:

Management	- Who in the company is responsible for managing environmental issues? - Do you operate an environmental management system? - Are there ways in which staff can raise concerns about health and safety issues or general working conditions? - How is the company viewed by the local community? - What has been the most significant innovation in the company in the last 5 years? - Who was involved in that? - Other questions:

	Raw Materials	Production	Transportation	Use	End of Life
Material and water intensity					
Energy intensity					
Health & Toxicity					
Other social					
Profitability					
Job creation and security					

	Helpful to becoming more sustainable	**Harmful** to becoming more sustainable
Internal origin (attributes of the company)	STRENGTHS	WEAKNESSES
External origin (attributes of the environment)	OPPORTUNITIES	THREATS

Force Field Analysis   **Date:**   **Version:**

Drivers   ← STRENGTH   STRENGTH →   **Barriers**

Category	Issue					Issue	Category
People	Issue 1					Issue 1	People
	Issue 2					Issue 2	
Process	Issue 3					Issue 3	Process
	Issue 4					Issue 4	
Context	Etc.					Etc.	Context
	Total FOR change					Total AGAINST change	

9 Windows on the World

Date: Version:

AFTER PROCESS

PROCESS

BEFORE PROCESS

SUPER SYSTEM

SYSTEM

SUBSYSTEM

Structured Thinking Questions

- What is the Sustainable Final Result?

- What are the obstacles to this?

- Why or how does this interfere?

- Under what conditions would the interference disappear?

- What resources are available to create these conditions?
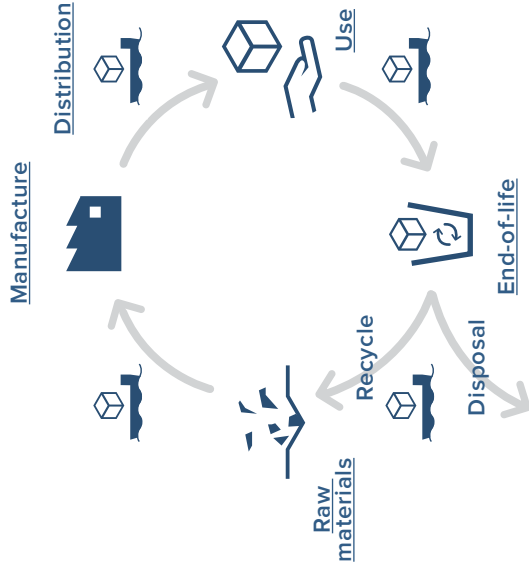
- Has anyone else been able to solve this problem?

New Concepts

- Dematerialise
- Increase shared use
- Provide a service

Manufacture

- Alternative production techniques
- Reduce number of components
- Fewer production techniques
- Less waste production

Distribution

- Less/cleaner/reusable packaging
- Energy-efficient transport and logistics

Usage

- Lower energy consumption
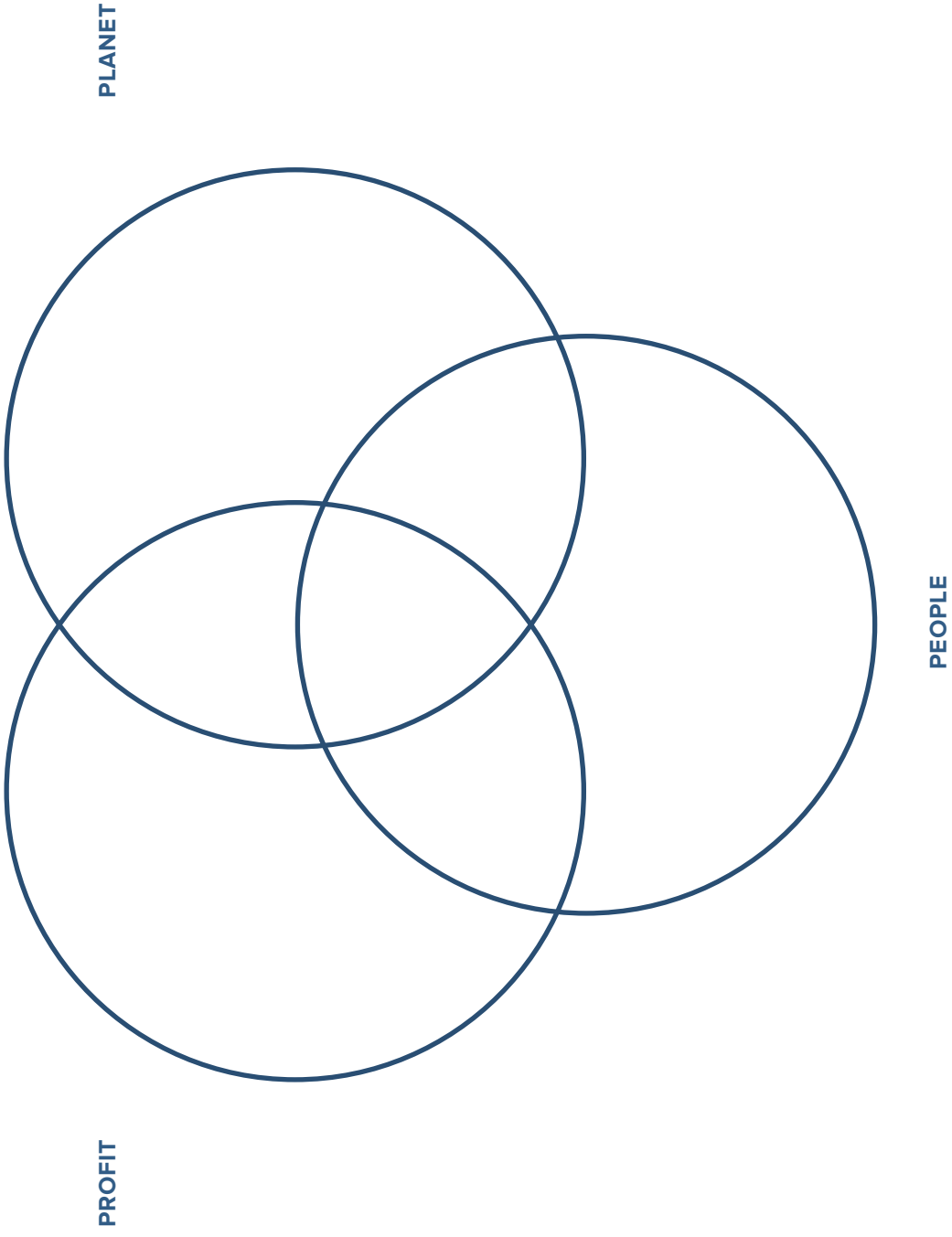- Renewable energy
- Reduce use of consumable
- Cleaner consumables

Materials

- Reduce quantity of materials
- Cleaner material
- Renewable material
- Lower energy-content material
- Recycled/Recyclable materials

Durability

- Integrate product functions
- Easy maintenance and repair
- Modular product structure

End-of-life

- Product or component re-use
- Design for disassembly / recycling / reconditioning

Manufacture — Distribution — Use — End-of-life — Disposal — Recycle — Raw materials

Risk Register for company: **Proposal name:**

Risk code and name	Impact description	Proba-bility(1-3)	Impact(1-3)	Risk score	Mitigation	Contingency	Action date	Action by

	Metric	Current situation	Option 1	Option 2	Option 3
BENEFITS	Energy intensity				
	Material and water intensity				
	Human health and toxicity				
	Other social issues				
	Profitability				
	Job creation and security				
RISKS	Long term risk (after mitigation actions and successful implementation)				
	Implementation risk (High/Medium/Low)				
COSTS	Upfront capital investment (state cost estimate)				
	Implementation effort (High/Medium/Low)				

Requirements specification for company:

Project name:

Number or code	Requirement	Comments	Priority(MSCW)	Review date	Reviewed / Approved

People Planet Profit

PLANET

PEOPLE

PROFIT

For further information contact:

About the UNEP Division of Technology, Industry and Economics

Set up in 1975, three years after UNEP was created, the Division of Technology, Industry and Economics (DTIE) provides solutions to policy-makers and helps change the business environment by offering platforms for dialogue and co-operation, innovative policy options, pilot projects and creative market mechanisms.

DTIE plays a leading role in three of the six UNEP strategic priorities: **climate change, harmful substances and hazardous waste, resource efficiency.**

DTIE is also actively contributing to the **Green Economy Initiative** launched by UNEP in 2008. This aims to shift national and world economies on to a new path, in which jobs and output growth are driven by increased investment in green sectors, and by a switch of consumers' preferences towards environmentally friendly goods and services.

Moreover, DTIE is responsible for **fulfilling UNEP's mandate as an implementing agency for the Montreal Protocol Multilateral Fund** and plays an executing role for a number of UNEP projects financed by the Global Environment Facility.

The Office of the Director, located in Paris, coordinates activities through:

> **The International Environmental Technology Centre** - IETC (Osaka), promotes the collection and dissemination of knowledge on   Environmentally Sound Technologies with a focus on waste management. The broad objective is to enhance the understanding of converting waste into a resource and thus reduce impacts on human health and the environment (land, water and air).

> **Sustainable Consumption and Production** (Paris), which promotes sustainable consumption and production patterns as a contribution to human development through global markets.

> **Chemicals** (Geneva), which catalyses global actions to bring about the sound management of chemicals and the improvement of chemical safety worldwide.

> **Energy** (Paris and Nairobi), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.

> **OzonAction** (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.

> **Economics and Trade** (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies. This branch is also charged with producing green economy reports.

DTIE works with many partners (other UN agencies and programmes, international organizations, governments, non-governmental organizations, business, industry, the media and the public) to raise awareness, improve the transfer of knowledge and information, foster technological cooperation and implement international conventions and agreements.

For more information,
www.unep.org/dtie

The implementation of *Eco-innovation* in a company means incorporating sustainability throughout all business operations based on life cycle thinking - to create solutions that meet market needs. This is most effectively done in cooperation with partners across the value chain.

This *Eco-innovation Manual* and respective *Tool Instructions* aims to provide stepwise guidance for technical experts working in organizations that provide professional services to companies, namely SMEs to implement eco-innovation. It can also be used by technical experts within companies themselves to start the process of eco-innovation. Each chapter of this *Manual* guides the user through a specific phase: from research and preparation, setting the strategy and business model of the company through building the roadmap and implementation through to the final review phase. It details the process and provides tools to be used in each of these phases. It also gives practical examples of each step of the process and the application of the recommended tool through a learning case study.

This Manual is a working version to be applied during the national level implementation of the UNEP Eco-innovation Project, which entails a pilot-application of eco-innovation in approximately 40 SMEs across Latin America and the Caribbean, Asia Pacific and Africa. Sector specific supplements to the manual are also being developed for the agri-food, metals, and chemicals sectors and used for the pilot application. Based on the feedback from this pilot application phase, the final *Eco-innovation Manual* will be further refined for final publication by May 2017.