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IMPROVING A TOOL FOR MATERI-  
ALS REPORTING OF CORPORATE RE-  
SPONSIBILITY REPORT

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## TIIVISTELMÄ

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Tämä opinnäytetyö tehtiin toimeksiantona Wärtsilä Finland Oy:lle. Työn tarkoituksena oli kehittää yrityksen työkalua, joka kokoaa tuotannossa käytettyjen materiaalien tiedot. Työkalua tarvitaan Global Reporting Initiative (GRI) raportointiohjeiden mukaisessa yritys vastuuraportoinnissa, jonka yhtenä osana on yrityksen materiaalitehokkuuden raportointi. Kyseistä työkalua käytetään myös pakkausmateriaalien raportoinnissa RINKI-organisaatiolle. Molempien raportointien suhteen raportointivaatimuksiin on tullut hiljattain muutoksia, joten raporttien laadun parantaminen oli ajankohtaista.

Työssä on perehdytty yritys vastuuseen, yritys vastuuraportointiin, toimeksiantajan raportointikäytäntöihin sekä raportoitavien materiaalitietojen vaatimuksiin. Kehitystyö suoritettiin selvittämällä moottorien olennaisimmat komponentit, niiden materiaalit ja painot sekä tehtaalla käytetyt kemikaalit ja pakkausmateriaalit.

Työn lopputuloksena saatiin tehtyjen selvitysten perusteella luotua uusi työkalu. Uusi työkalu osoittautui paljon tarkemmaksi ja selkeämmäksi kuin vanha. Jatkossa työkalua tulisi kehittää erityisesti tuotteisiin liittyvien materiaalitietojen osalta ottamalla entistä paremmin huomioon komponenttien painoerot eri kokoisten moottorien välillä.

## ABSTRACT

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This thesis work was ordered by Wärtsilä Finland Oy. The objective of the work was to develop a tool that would gather information of materials used in the factory of the company. The company conducts corporate responsibility (CR) reporting according to the Global Reporting Initiative (GRI) Sustainability Reporting Guidelines. The tool is needed for reporting the material performance reliably in the CR report. Moreover, the tool is used for reporting used packaging materials for the RINKI-organization. The reporting requirements concerning both reports were changed lately, so it was important to improve the quality of these reports.

First the focus of the thesis was on corporate responsibility, corporate responsibility reporting, and later on reporting customs of the client company and the requirements of the reported material information. The development project was made by examining the most relevant components of engines to be included in the tool, their weights and the materials they were made of, as well as chemicals and packaging materials used in the factory.

Based on the research made, a new tool was created for the client company. The new tool was proved to provide more accurate information and to be easier to use compared to the old tool. In the future, the tool should be developed further especially focusing on the material information related to products. That could be done by considering more carefully the weight differences between components of different sized engines.

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Keywords	Corporate responsibility, corporate responsibility reporting, Global Reporting Initiative and material performance
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## 1 INTRODUCTION

The role of corporate responsibility has increased significantly in last years. Therefore, the European Union (EU) has changed the legislation concerning sustainability reporting to consolidate the transparency and responsibility of the companies operating in its member countries. Today it is compulsory for large corporations with over 500 employees to report the impacts of their operations on economic, social and environmental levels. /1/

The client organization of this thesis work is Wärtsilä Finland Oy, which is one of the subsidiaries of Wärtsilä Oyj. The company provides complete life-cycle solutions that are enabled with smart technologies, for marine and energy markets. According to Wärtsilä, in a large scale its role and commitment in supplying sustainable energy solutions to all over the world, is very important /2/. The company has been investing in sustainability a lot, and in 2018 Wärtsilä was declared to be one of the hundred most sustainable companies in the world. /3/

Wärtsilä has been conducting sustainability reporting for years already and therefore, they must have been aware of the amounts of used materials in their operations. Material performance indicator was added to reporting in 2009. The aim of the thesis work was to develop a new tool for the client that would facilitate gathering information of all the used materials and make the information more accurate. The tool provides information only of operations of the factory located in Vaasa. The previous tool the company used for this purpose was defective and contained information that was based on estimations rather than on verified information.

In addition to improving Wärtsilä Finland Oy's corporate responsibility reporting, the aim of this thesis was to improve the company's RINKI report. The same tool is used when reporting packaging materials for RINKI. Producer responsibility bounds companies by law to organize and pay the collection and recycling of their packaging waste /4/. The RINKI-organization offers companies services to take care of their implementation of producer responsibility. It charges its clients based on the amount of used packaging materials, so it was necessary to ensure the real amount of them used in the company. /5/



First, the focus of this thesis work is on corporate responsibility, after which sustainable reporting according to Global Reporting Initiative Guidelines is explained more closely. The introduction of RINKI -organization and its operations are also presented. A closer look into the Materials questionnaire of the sustainability reporting in the client company is needed to understand the constraints of the practical development work of the thesis. After the theory part, the client company is presented in more detail and the role of corporate responsibility in the company's operations, as well their practices of sustainable reporting are discussed. The practical part of the thesis, the process and the outcome of the development work are presented last.

## 2 CORPORATE RESPONSIBILITY

Corporations have a massive impact on the societies around them. These influences may be either positive or negative depending on the way companies conduct their operations. Nowadays consumers are more aware of ethicalness, sustainable development and the well-being of environment, which has increased requirements and pressure for corporations. Because of this development, companies are demanded to explain their impacts on the surrounding society and environment. Many organizations already have long roots with corporate responsibility reporting, and in the future the role of corporate responsibility (CR) reporting is only going to increase. That is because in 2016 a new directive from the European Union concerning CR reporting came into force. Previously CR reporting was voluntary for companies, but the new directive changed the reporting to be mandatory for all large companies in the EU member countries. /6/

Conducting CR reporting means an increase of the workload and effort for corporations since they might have to start reporting activities they have not measured before. However, obligation for reporting brings forth also advantages for the company. It enhances the transparency of the company and help them to identify and predict forthcoming business risks. /7/ Advantages of CR reporting are more closely later in this report.

### 2.1 Corporate Responsibility as a Concept

Corporate responsibility is a term that aims at describing the relation between an organization and society around it. The organization can have a huge effect on inhabitants, other companies, overall economy and environment in the society. Impacts the organization has can be positive, such as employing locals and bringing money for the society in the form of paid taxes. On the other hand, the impact on society may be negative, for example if the company's operations contaminate water resources in the region. Not only has the corporation impact on the society but also society affects corporation's operations. As an example of the relation, conservation areas nearby might limit significantly how the company can conduct its business. /8, 9/

The concept of corporate responsibility can create confusion since it can be discussed with different terms in different purposes. There are terms such as corporate social responsibility, corporate social responsiveness, business ethics, corporate sustainability and corporate citizenship. These terms are used besides corporate responsibility but in the recent years, the term “corporate responsibility” has regularized its utilization. The use of different terms is related to the development of the idea of corporate responsibility and the dimensions of it that were emphasized at the time. For example, “corporate sustainability” was widely used when environmental concerns were exposed, and companies were expected to show responsibility on that matter. In this thesis, the term corporate responsibility is used because compared to other terms, it is the most established and it is current since the work is related to corporate life. /10, 11/

## **2.2 The Development of Corporate Responsibility**

The concept of CR is still quite new in the society even though it has already settled its position as a part of companies’ business activities. The focus of CR has varied during the years depending on the societal situations at the time. The earliest attributes of CR started to emerge during the Industrial Revolution. After the revolution, social defects got a lot of attention whilst in late 1960s environmental aspects drew focus in the corporate life. /10/

Along with industrialization, people started to move from countryside to cities because of better working opportunities. People lived tightly in poor conditions, which led to numerous of social problems in cities. Therefore, some employers did voluntarily charity in order to prevent those challenges for their employees. Industrial employers could improve the living conditions of their workers with measures, such as building them accommodations and schools for their children as well as offering health care. These actions were not just charity for the company owners but on the background, there was a thought of maximizing the productivity of workers and make them better committed to the work. /12/

After the First World War, an early form of United Nations (UN), League of Nations, was founded in 1919 bringing together governments, corporations and labor

unions. As a part of it, International Labour Organization (ILO) was established focusing mainly on improving working conditions, occupational safety and health as well as preventing the use of child and forced labour. Also, after the Great Depression in the 1930s, a lot of changes were made in the legislations concerning the social wellness of citizens. Companies were started to be considered more as institutions that had social obligations towards the citizens. /10/

After the Second World War, there was a thought of sharing the economic wealth more fairly among the society, and so began the development of welfare societies. Nations started to improve their labour and social legislations and the role of trade unions increased. As a result, the number of social services grew rapidly and working conditions in factories were ameliorated. In addition, more attention was paid on human rights and consequently the member nations of UN approved the Universal Declaration of Human Rights in 1948. /10, 12/

Rapid industrialization encumbered the environment badly causing for example acid rains and smog. Those and other problems, such as contamination of water systems and soil drew attention to the well-being of Earth. In 1960s and 1970s the first environmental and human rights organizations were born, aspiring to emphasize defects in societies and influence the direction of legislations concerning them. Many new environmental standards were enacted, which meant that corporations needed to start limiting their emissions and being more responsible from the environmental point of view. /10, 12/

The development of information technology enhanced the spreading of globalization, in other words the networking of humans between continents. The world market was released after the Cold War and for example in Europe the common market was introduced. That enabled companies to move their businesses between countries easily. Many companies also relocated their production factories to developing countries where workforce was very cheap. This evolution pointed out a need for global statutes and for supervising their proper conduct, so that corporations started to respect human rights and other legislation also when operating in poorer circumstances. /12/

When going towards the 21<sup>st</sup> century, environmental awareness increased again, and the concept of sustainable development became stronger. Many countries committed to mitigating environmental hazards. Also, social and economic responsibility were more closely under the spotlight as the role of corporations grew further, and on the other hand, when violations concerning for instance corruption and child labor appeared. /12/

To sum up, in the 19<sup>th</sup> century the idea of corporate responsibility was constrained in the thought of what good the corporation could do for the society with the fortune it had earned. Instead, today the most important matter in the corporate responsibility is how the corporation accumulated its fortune in first place. People want to know if companies follow and conduct morally and ethically accepted policies in their actions. /10, 13/

### **2.3 Dimensions of Corporate Responsibility**

Traditionally the success of companies has been measured based on their economic performance. However, along corporate responsibility the way how corporate success was seen changed, and there was a need to describe the success in other ways as well. In the mid-1990s, a British business author John Elkington came up with a term “triple bottom line” which suggests that when measuring responsibility of a company, besides economic performance also social and environmental performance need to be taken into consideration. /14/ Conducting economic, social and environmental dimensions responsibly leads the company towards more sustainable operations. As seen in Figure 1, companies must be responsible in all the three dimensions to have balance in their operations and to be as responsible as possible.



**Figure 1.** Dimensions of corporate responsibility and their relations. /15/

Economic performance is easy to measure because it mostly involves numbers. Instead, social and environmental dimensions are more complicated to measure since those matters are not always countable. Therefore, it is difficult to set them indicators to illustrate properly their performance. Practically it can be difficult to separate these dimensions from each other because they are in a close relation with each other /12/. For instance, in case of a company polluting the environment, it would not only deteriorate the company's environmental performance, but it would also have a negative impact on the health of local people as well as on the reputation of the company, which could lead to economic loss.

Economic dimension is the foundation of being able to be a responsible corporation. That is because without profitability, there would not be a company to consider. When the company is profitable, it can focus on managing social and environmental responsibility as well and share economic welfare for the whole society. Economic welfare can be distributed among the society by direct means of paying wages for workers, dividends for shareholders, taxes for society and making new investments. Economic responsibility affects the society also indirectly by increasing employment rate and enlivening the economy in the region. /12/

The idea of CR includes a thought of aiming at profitability in a long term instead of focusing only on quarterly or yearly profits. The company may invest in environmental matters that do not bring profit right away but in the long term it will

lead to significant savings for the company and support similarly sustainable development. In addition, the lowest considered level of CR is complying with laws. Economic responsibility is largely fulfilled by only following local legislations. /12/

Social dimension includes basically all the people that are somehow in interaction with the company. One of the most important groups in social responsibility are employees and the concentration is especially on their working conditions, occupational health and safety as well as educating them more than required by law and collective labor agreements. In the eyes of society, companies are seen as responsible for enhancing employment rate and minimizing the effects of reducing the amount of work force, for example due to outsourcing. Moreover, companies have responsibility for their customers. They have to make sure that consumer protection is being implemented and that all the products and services they provide are safe to use. /12/

Environmental dimension comprises the idea that companies are responsible for protecting air, soil and water, reducing emissions, securing the biodiversity of nature, reducing the amount of created waste as well as utilizing natural resources efficiently and sparingly. The purpose of environmental responsibility is to make companies change their operations for more environmentally friendly direction. The goal is that companies would integrate environmental thinking in their actions so that environmental impacts were considered already in the planning phase of a new product or a production process. For some companies, green values are the very base of their operations and they see an opportunity in environmental responsibility. These kinds of companies can be for instance producers of renewable energy systems or companies that offer services for cleaning oceans from trash. These kinds of businesses benefit both the company and the society, and it can be said that companies create shared value for the society. /12/

Nowadays companies operate in multiple locations including developing countries. Legislation in those countries is often poor compared to western countries, so operating according to local legislation is not sufficient for the level of responsibility that is expected from stakeholders. Therefore, in each dimension of sustainability

companies need to decide the applied scope of responsibility in the region. For instance, companies can improve social conditions for locals by refusing to take part in corruption and declining the use of child or forced labor in its operations and requiring the same from its suppliers and partners. /12/

## **2.4 The Role of Stakeholders**

A stakeholder denotes a person or a group, which interacts with a company at some level. Meaning that the company's operations affect stakeholders somehow while, on the other hand, stakeholders may have an impact on how the company is operating. Some stakeholders have a closer relation to the company or their role from the company's operational point of view is bigger. Consequently, stakeholder groups can be divided into primary and secondary stakeholders based on their importance and role. /8/

Primary stakeholders can be classified as those groups that have a formal relation with the company, for example through contracts. On top of that, the impact of the company on stakeholders and vice versa is direct. These kinds of primary stakeholders can be shareholders, employees, customers, suppliers and local society. Secondary stakeholders, such as non-governmental organizations (NGO), competitors, government and media, have indirect impacts on the company. /8/

Companies depend on their stakeholders because stakeholders enable the working of the company and its success. Each stakeholder group has their expectations for the company, for instance owners expect specific business results, customers quality products or services, employees safe working conditions while environmental organizations expect companies to take care of the environment. It is important for companies to be aware of the expectations of different stakeholders so that they can lead their operations in directions that satisfy all or at least majority of the stakeholders. /9/

For some stakeholders, such as owners, companies are accountable and need to consider their opinions when making strategic decisions. However, communication



with stakeholders is often voluntary since it is beneficial for companies. If the aspects of different stakeholders are conflicted, companies have to choose which stakeholders' opinions contribute the company the most or, if possible, they should try to compromise and keep everyone satisfied. /8, 9/

Communication between companies and their stakeholders is important for having good stakeholder relations and being able to know their visions. Interaction with different stakeholders varies from partnerships to simply informing important matters. Cooperation and partnerships are normally settled with stakeholders that have great interests and possibilities to influence companies' operations. Interaction with stakeholders of medium level interest and possibilities to influence the company is done by dialogue. This means that the parties meet intermittently and tell each other about the most fundamental matters that are going on in their operations. For stakeholders with little possibilities to influence companies, sufficient way of communication is informing. /9, 16/

Companies can utilize the views of their stakeholders when determining the contents of the sustainability report and deciding management strategies. Materiality analysis for stakeholders have increased in past years. The materiality analysis enables stakeholders to communicate matters they value the most as well as issues they see are the most important for the company to take into account. /8/ Other benefits of stakeholder communication, such as identifying global megatrends and creating added value, are regarded later together with other CR reporting benefits.

### 3 CORPORATE RESPONSIBILITY REPORTING

After the responsibilities of companies had extended from economic dimension to cover also social and environmental dimensions, reporting of these matters has become necessary besides reporting only economic performance. Corporate responsibility reporting was created for that purpose and many stakeholders require CR reporting from companies today. CR reporting was voluntary for a long time for companies and since the beginning of 21<sup>st</sup> century it has increased steadily /9/. Nevertheless, CR reporting is a relatively new thing and many companies do not have yet settled practices for its implementation. Therefore, Global Reporting Initiative (GRI) has created guidelines to help companies to determine essential issues that should be reported. The aim of common guidelines is also to increase the comparability of the results between corporations.

The economic part of the report gives stakeholders a view of the financial success of the company in figures of profits and turnover. Additionally, it measures responsibility for instance in figures of creating new jobs, investing in Research and Development (R&D) as well as paid taxes and wages. This way stakeholders can better understand economic impacts of the company to surrounding people and society. Social reporting tells the effects companies have on societies and how well they carry out responsibility of those matters. These issues include matters, such as occupational health and safety, implementation of human rights and respecting consumer protection. Environmental reporting contains information of all the environmental impacts of the company, measures to mitigate the impacts as well as efforts made for protecting the environment. There are several measurable issues, such as carbon dioxide emissions as well as the amount of used materials and created waste that help to define the environmental responsibility performance of the company. /9/

CR reporting should include only the most relevant issues. Openness, transparency and efficient communication are the leading principles of CR reporting but still not everything about everything should be reported /9/. That is where the role of stakeholder interaction stands out. Companies need the help of its stakeholders to decide

which are the values and issues that are the most important from their operational point of view. In the best scenario both the creator and readers of the report benefit from it.

### **3.1 Evolution of Corporate Responsibility Reporting**

When awareness of the corporate responsibility spread in the world, in the 1990s the first reports related to it appeared. However, the first reports mostly concentrated on environmental issues and were also otherwise rudimentary. The focus of the CR reporting has changed between social and environmental issues over the years but today it covers equally all three dimensions /10/.

The problem with early CR reports was that companies used different indicators and proving the correct information was difficult. Accordingly, there was a need for creating common reporting guidelines that could be applied to all organizations regardless their size or the field of activity. GRI was established for that purpose and it created guidelines as well as measurement and calculation principles for CR reporting. /8/ GRI is presented more closely later in this thesis.

#### **3.1.1 Policy Development in Corporate Responsibility Reporting**

The EU and the UN have encouraged organizations to conduct CR reporting for a long time to increase the transparency of their actions. While reporting was voluntary, many companies were committed to conduct it since they understood the benefits of it. Today the role of CR is bigger than ever and consequently legislation concerning the reporting has changed. In 2016 a new legislation took place in the EU member countries that requires companies employing more than 500 persons to conduct CR reporting. First mandatory reports cover the financial year 2017–2018 and the first reports are to be published in 2018. /6/ The renewal of the directive affects corporations differently depending on their existing level of CR reporting.

New directives are not automatically binding in the member countries, but they need to be added to the legislation separately. The obligation to report corporate responsibility was added to the Finnish Accounting Act in 2016 so it has been obligatory for Finnish companies right from the beginning. /1/ The aim of the renewal

is to get a more reliable and transparent image of corporations' actions while emphasizing that responsibility belongs to all organizations.

In practice, the new directive requires companies to report on topics of their environmental, social and employee-related issues as well as about human rights, anti-corruption and bribery. Companies must describe their business models, outcomes and risks of their policies related to before mentioned topics, and their diversity policies and how they are applied for management and supervisory bodies in companies. However, assurance of the report is still voluntary for companies. /6/

Companies have the freedom to choose how they are going to implement the new legislation in their businesses. Even though above-mentioned things are necessary to report, it is up to companies how they want to report the required information. The directive is flexible in order to be suitable for all the different fields of companies to apply. /1/ Nonetheless, companies are encouraged to follow recognized frameworks, such as GRI's Sustainability Reporting Guidelines, in their CR reporting.

### **3.2 Motives for Corporate Responsibility Reporting**

Being a responsible corporate citizen and conducting CR reporting have multiple benefits which contribute the financial value of the company either directly or indirectly. In addition to legislation, the motive for responsible operation is normally increasing the profitability. That can be best achieved by focusing on all the three dimensions of responsibility simultaneously and considering stakeholders' views.

As a result of CR, the company can make economic savings that save environment at the same time, for instance, by increasing materiality efficiency, enhancing material usage and cutting business trips. Savings can turn out to be enormous in a long term, especially if future legislation is considered in the development. By predicting new legislations, the company can avoid letting laws to limit the operations or having extra expenses because of repair investments. /12, 6/

Further, investing in social responsibility brings the company great benefits. Paying carefully attention to occupational health and safety reduces the number of absences

which in return diminishes expenses and improves productivity. Additionally, investing in comfort and education as well as ensuring opportunities for proceeding in careers increases the motivation of employees resulting in more efficient working. /12/

Legislators hold a great power in changes of CR by adjusting the wanted minimum level of it for corporations. They aim at both encouraging and pressuring companies to act a more responsible way by tightening laws. New legislation might have negative impacts on the company if it has not prepared for the changes. Therefore, new legislation might add expenses, limit operations of the company or even forbid an important sector of its functions. For instance, for a company producing pesticides, a prohibition of certain chemical could lead to a shutdown of its operations if they had not prepared and come up with a substitutive chemical in time. The fulfillment of the law is supervised so ignoring the law causes punishments, either financial or restrictions for operations. In addition, the increase in demand and having a competitive advantage, preparing for changes in legislation helps the company to gain valuable experience and resources while other corporations are still learning how to integrate the changes as part of their functions. /6, 12, 17/

Stakeholders are an important part of the company's operations and their expectations must be met to keep the business successful. CR reporting is a good way to communicate with stakeholders. The company does not have to respond inquiries separately from each stakeholder, but it can gather all the relevant information in the CR report and the information is available for all the stakeholders which makes the communication about responsibility issues more efficient. Moreover, CR reporting shows stakeholders the transparency of actions and contribute the good reputation of the company. /8, 17/ Communication with stakeholders helps the company to enhance its management performance, facilitate identifying and managing risks as well as perceiving opportunities /12/.

Close interaction with stakeholders offers other benefits as well. By listening to stakeholders' views, companies may notice changes in attitudes and habits very sensibly and use those changes as opportunities /4/. Identifying these global mega-

trends in an early phase is important since it gives information of possible changes in demand. One of the biggest megatrends of today is demand for more environmental and ethical products. The sooner companies recognize the change in demand, the sooner they can develop products to cover the new demand and thus establish their market position. This way companies can create added value because they increase their profits while contributing the environment and satisfying expectations of their stakeholders. /12/

Altogether, improving and maintaining a good reputation is one of the main benefits of CR reporting for the company. The good reputation increases the trust of consumers which can be seen from the growth of sales. That in turn makes the company more economically stable improving trust and satisfaction of investors. All in all, by conducting CR reporting, the company can show its stakeholders their commitment in different dimensions of responsibility and stakeholders can see that company's functions are justified. /9/

## **4 GLOBAL REPORTING INITIATIVE**

The Global Reporting Initiative is a non-governmental organization (NGO) which was founded by the United Nations Environmental Program (UNEP) and the Coalition for Environmentally Responsible Economies (CERES) in 1997 /6/. The organization is based in Amsterdam and it includes board of directors, stakeholder council, technical specialist committee and secretariat. Prerequisites for the operations are organizational stakeholders that pay membership fees to GRI and in return they get materials and services to facilitate their CR reporting. /10/

GRI has worked hard to create framework for reporting, and it has quickly established its position as a guideline for reporting. Cooperation with the most important stakeholders, such as investors, consumers, authorities, NGOs and trade unions, made possible the successful creation of guidelines. /8/ That has enabled getting a wide picture of all the necessary performance indicators and ways to measure them. The goal is that all the companies could apply it regardless the location, size or branch of activity of the company. The GRI Sustainability Reporting Guidelines are not perfect yet for that purpose and, therefore, they are continuously updated and specified. The fourth edition of the Guidelines, known also as G4 Guidelines, were superseded by the GRI Standards in 2016. GRI includes Sector Supplements because of the special and complicated nature of certain sectors. The Sector Supplements have been created for fields, such as oil and gas industry, finance sector, electricity companies as well as for mining and metal industries to facilitate their reporting. /6, 12/

### **4.1 Guiding Principles And Contracts**

One of the most important edicts that has influenced founding GRI is the Universal Declaration of Human Rights by UN. The declaration emphasizes equality regardless of race, religion, nationality, sex, language, nationality, or any other reason. Human rights guarantee the same rights for everyone over country borders and the rights cannot be taken away from anyone regardless of the situation. /18/ The Universal Declaration of Human Rights has been the foundation for human right contracts concerning certain groups, such as women and children. In firsthand states

are responsible for supervising that the rights are fully implemented, whereas companies are responsible for ensuring the rights are respected in all their activities. When thinking about CR, the company must consider the sphere of its influence, in other words, whether it is sufficient to make sure human rights are applied in internal operations of the company or if it should ensure for instance that human rights are fulfilled in the local society as well. /8/

In addition to human rights, there are several other edicts and contracts that influence companies and so they must be considered also in CR. These kinds of contracts are related to, for instance, working life, environment and responsible business. In Europe, the EU has made statements, frameworks and guidelines that guide companies for more responsible behavior. /8/

The International Labour Organization (ILO) has enacted contracts focusing on the fundamental rights of working life. According to them, one of the most relevant rights in working life are freedom to organize as well as the ban of forced and child labour. The organization has also made several contracts related to wages, working hours, occupational health and safety as well as the end of an employment that are important from the corporate responsibility point of view. /19/

The UN has improved the state of environment and sustainable development with different contracts and conferences. The most significant of them have been a conference on environment and development in Rio de Janeiro in 1992 and the follow-up conferences in Johannesburg in 2002 and again in Rio de Janeiro in 2012. These conferences covered issues, such as sustainable development, eradication of poverty, advance protection of nature, changing consuming and production habits as well as action plans for each issue. /20–22/ It was also denoted that companies have to contribute for their part the creation of sustainable societies and act responsibly. Based on the conference held in 1990s, the UN published the Millennium Development Goals that were signed by every member country. These goals act as international rules giving clear and common targets for societies. /8/

Besides the UN and the ILO, the Organization for Economic Cooperation and Development (OECD) has been an important influence for the development of CR as



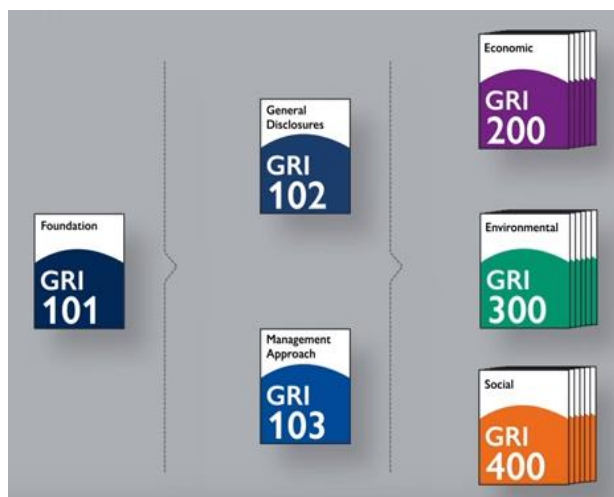
it is today. The OECD concentrates on improving economic growth of its member countries, living standards, sustainability and international trade. The OECD has created voluntary guidelines for multinational companies so that they can adjust and guide their actions so that they fulfill the expectations of the society. In the center of the guidelines are, for example, environmental protection, prevention of corruption, relation in working life, responsible supply chain, consumer protection and taxation. /23/

In addition, the EU has published multiple statements about CR where it encourages the member countries to report about social and environmental responsibilities along with economic reporting and to confirm reports by third party /8/. Also, the decision to change CR reporting mandatory was originally based on reports and statements of the European parliament. The EU is an important leader in the field of corporation responsibility, and several countries and organizations follow their voluntarily guidelines as well. /8/

## **4.2 Contents of Global Reporting Initiative Standards**

The GRI Guidelines had four editions before the newest version, the GRI Standards, was released. The base of the GRI Standards contains three universal standards that are used by all the corporations that conduct CR reporting. First of the universal standards is called the Foundation, which guides how to use and reference standards while introducing the reporting principles and explaining how to create a report that is in accordance with the GRI Standards. The other universal standards are General Disclosures and Management Approach /6/

Moreover, there are three Topic Specific Standards that cover areas of economic, social and environmental performance. From these standards the organization needs to choose the most relevant standards. The General Disclosures and Management Approach are applied when reporting about the Topic Specific Standards. They are used together with the Topic Specific Standards to report contextual information about the corporation and its reporting practices as well as explain why the topic is material, how it is managed and where the impacts occur. /6/ Figure 2 illustrates the contents of standards and their hierarchy.



**Figure 2.** Visualization of the contents of GRI Standards. /6/

The most significant difference in the GRI Standards compared to previous guidelines, is that it can be easily updated. In the old guidelines, it was impossible to update separate sections, but all the changes were made at once and then new versions, such as G3 or G4, were published. However, the new GRI Standards enable updating specific topics, so its users have always the most recent guidelines available. /6/

### 4.3 Performance Indicators

The contents of the GRI guideline is separated in three sections according to the responsibility dimensions, which are economic, social and environment. In order to be able to compare collected information between companies and nations, performance indicators have been created. The goal of performance indicators is to produce either quantitative or qualitative information of the performance and impacts of each sector of responsibility. The performance indicators are divided into two levels based on their relevance and frequency. The core performance indicators are indicators that are the most relevant matters and common for every corporation regardless of their field of activity. Such performance indicators are, for instance, usage of materials, energy consumption and the number of employees. The additional performance indicators are indicators that supplement the information of core

indicators. An example of an additional indicator is reporting the number of employees distributed by sex or age. /12/ Figure 3 presents all the reportable performance indicators that should be included in the CR report.

TABLE 1: CATEGORIES AND ASPECTS IN THE GUIDELINES				
Category	Economic		Environmental	
Aspects <sup>II</sup>	<ul style="list-style-type: none"> <li>• Economic Performance</li> <li>• Market Presence</li> <li>• Indirect Economic Impacts</li> <li>• Procurement Practices</li> </ul>		<ul style="list-style-type: none"> <li>• Materials</li> <li>• Energy</li> <li>• Water</li> <li>• Biodiversity</li> <li>• Emissions</li> <li>• Effluents and Waste</li> <li>• Products and Services</li> <li>• Compliance</li> <li>• Transport</li> <li>• Overall</li> <li>• Supplier Environmental Assessment</li> <li>• Environmental Grievance Mechanisms</li> </ul>	
Category	Social			
Sub-Categories	Labor Practices and Decent Work	Human Rights	Society	Product Responsibility
Aspects <sup>II</sup>	<ul style="list-style-type: none"> <li>• Employment</li> <li>• Labor/Management Relations</li> <li>• Occupational Health and Safety</li> <li>• Training and Education</li> <li>• Diversity and Equal Opportunity</li> <li>• Equal Remuneration for Women and Men</li> <li>• Supplier Assessment for Labor Practices</li> <li>• Labor Practices Grievance Mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>• Investment</li> <li>• Non-discrimination</li> <li>• Freedom of Association and Collective Bargaining</li> <li>• Child Labor</li> <li>• Forced or Compulsory Labor</li> <li>• Security Practices</li> <li>• Indigenous Rights</li> <li>• Assessment</li> <li>• Supplier Human Rights Assessment</li> <li>• Human Rights Grievance Mechanisms</li> </ul>	<ul style="list-style-type: none"> <li>• Local Communities</li> <li>• Anti-corruption</li> <li>• Public Policy</li> <li>• Anti-competitive Behavior</li> <li>• Compliance</li> <li>• Supplier Assessment for Impacts on Society</li> <li>• Grievance Mechanisms for Impacts on Society</li> </ul>	<ul style="list-style-type: none"> <li>• Customer Health and Safety</li> <li>• Product and Service Labeling</li> <li>• Marketing Communications</li> <li>• Customer Privacy</li> <li>• Compliance</li> </ul>

**Figure 3.** Description of performance indicators according to GRI G4 Guidelines. /24/

The economic indicators are mostly about financial flows and they illustrate company's effects on economic well-being and systems at both local and global levels. The economic category includes indicators of economic performance, market presence, indirect economic impacts and procurement practices. Economic performance is about the economic value generated and distributed, governmental financial assistance, company's benefit plan obligations as well as emerged risks and opportunities due to global warming. The market presence covers issues concerning minimum wages in operation locations and the proportion of senior management hired

from the local community. In the category of indirect economic impacts, infrastructure investments and supported services are included, as well as significant indirect economic impacts of the company. Procurement practices require explanation of the proportion company spends on local suppliers. /24/

The base of environmental performance indicators is identifying material flows and categorizing them into efforts and outcomes as well as into their environmental impacts. Efforts represent indicators, such as use of materials, water and energy while outcome indicators cover waste and effluent emissions and other pollutants. In addition, there are indicators related to compliance of environmental laws, biodiversity, impacts of transportation and environmental assessment of suppliers. It is important that environmental indicators are reported both in absolute and relative figures. The absolute figures are reported to be able to better evaluate the scope of impacts and actions to certain ecosystems and carrying capacities. Relatively reported information is necessary to see better the efficiency of the company since that facilitates comparisons between companies. /8, 12, 24/ The development project of the thesis is related to material performance indicator, and it is explored later more closely.

The performance indicators of social responsibility are both quantitative and qualitative, and they are separated into four categories. These groups are labour practices and decent work, human rights, society and product responsibility. Most of these indicators are based on international contracts and guidelines, such as declaration of human rights by the UN, working life rights by the ILO and guidelines about corruption and fair trade by the OECD. /12/

Indicators related to labour practices and decent work are, for instance, employment, occupational health and safety, training and education as well as equal remuneration for women and men. Human rights indicators cover issues, such as child and forced labour, non-discrimination, supplier human rights and security practices. Society indicators, in other words company's impacts on surrounding societies, are measure matters, such as anti-corruption, anti-competitive behavior, compliance of laws and grievance mechanisms for impacts on society. The purpose of product

responsibility indicators is to measure customer health and safety, product and service labelling, customer privacy, compliance of laws and marketing communications. /24/

#### **4.4 Creating a Corporate Responsibility Report**

The newest edition of the GRI guidelines, G4, forms a comprehensive tool together with calculus guides and sector supplements for creating a CR report. Before creating the report itself, the company needs to decide which issues are the most important to be included in the report. Materiality analysis made by stakeholder play a great role in defining the key issues. Based on these issues, the decision-making can be controlled to benefit performance indicators and reporting customs. /8/

The process of defining the reporting contents consists of different phases. First, internal and external economic, social and environmental issues that are significant for the company's operations, must be identified. The process proceeds by estimating the relevance of each issue for the company and its stakeholders. When prioritizing the issues, it is necessary to decide the sufficient number of indicators as well as the wanted reporting accuracy. The next step is to validate the chosen reporting principles, which help to make sure that the report gives a sufficiently balanced picture of company's functions and responsibility. The management of the company has to accept reporting principles, after which sufficient systems and processes must be implemented or developed in order to collect all the necessary information. The last thing is to re-evaluate the significance and relevance of the principles used in the previous CR report. The evaluation includes ensuring the context of sustainability, in other words, putting actions into wider perspective of sustainable development. Additionally, the company must evaluate the importance of the principles for stakeholders, as well as, consider how the expectations and needs of them have been taken into account in the process. /8/

When reporting principles are chosen, principles for defining calculus entities should be determined. That means defining the scope of reported performance indicators. It can be juridical, operative or otherwise unambiguous function and it is possible to collect and report economic, social and environmental information of

them. A calculus entity can be, for instance, all the business places of an industrial company. Without defining these entities, collected information would not be usable and comparable. Practically, calculus entities should include entities that the company has direct impacts on, whereas indirect impacts are not always necessary to consider. /8, 24/

#### **4.4.1 Application Scale**

There are two levels from which the company can choose according to which one they want to conduct their CR report. Despite the size, location or sector, any company can choose to apply either of the reporting levels. The focus in both options, Core and Comprehensive, is to identify such material aspects that has significant importance to the company and its impacts on economic, social and environmental level. /24/

The Core option includes only the most important and relevant elements, so that the information creates a background against which the company communicates the impacts of social, economic and environmental performance. A comprehensive option is an extinction of the Core option and it requires more detailed information. For the Core option only one disclosed indicator and the Generic Disclosure on Management Approach (DMA) is required for each identified material Aspect. By contrast, on top of the Generic DMA, in the Comprehensive option all material Aspect-related indicators are required to report. /24/

#### **4.4.2 Contents of the Report**

The GRI guidelines include specifications both for contents and structure of the report. The basic contents of the report is divided into two sections, General Standard Disclosures and Specific Standard Disclosures. The General Standard Disclosures are meant for all the companies to apply regardless of the field of activity or the size. It comprises strategy and analysis of the company, relevant performance indicators with their calculus entities and descriptions of the organization, management, stakeholder inclusiveness, report itself and ethicalness of the business. The purpose of the General Standard Disclosures is to give a reader a comprehensive

picture of the factors that influenced the contents of the report, such as defining relevant issues and expectations of stakeholders. /8, 24/

The Specific Standard Disclosures in turn aim at giving comparable information of results and development of the issues belonging to CR reporting, as well as, illustrating management systems. It contains descriptions of the management's practices and social, economic and environmental performance indicators. Reporting principles that have been determined beforehand guide the accuracy and the scope of the Specific Standard Disclosures. /8, 24/

When "in accordance" level has been decided and the needed General and Specific Standard Closures are prepared, the creation of sustainability report can be started. All the prepared information is to be presented in the report. The report can be published as a web-based or a paper version, or as a combination of the two. The choice can depend on, for example, plans for updating the contents and strategy for the distribution of the report. Nonetheless, audience must have access to the complete set of information via one medium, at least. /24/

#### **4.4.3 Assurance of the Report**

Since CR reporting is mandatory for large companies, the role of assuring the report has grown bigger. The assurance of the report is not required in order to be in accordance with the GRI guidelines. However, the GRI recommends using an external and independent party to assure the contents of the report. Creating a CR report is company's own responsibility so using an external assurance increases the reliability of the report. Reliability is one of the most important qualities the report has, since based on its information the management and stakeholders of the company make decisions. Besides reliability, there are other benefits as well concerning the external assurance. The company can ensure the functionality of their data collection, receive information of strengths and weaknesses in their CR reporting practices, as well as, the management gets information of how well policies and methods are implemented in the organization. /9, 24/

The assurance of the report is not yet mandatory like reporting because organizations wanted to be provided with time to develop their reporting systems to correspond the requirements of external reporting. CR reporting is a relatively new custom, so its practices are not yet internationally so established that assurance could have been combined with it effortlessly. In addition, practices for the assurance are still in a developing stage so there is not yet any common and settled way for doing it. External assurances are normally conducted by accounting companies, certification bodies and technical consultant organizations. /8/

#### **4.5 Materials Performance Indicator**

Material usage of the company is one of the most important matters to include in the sustainability report. Material aspects are relevant because based on them it can be indicated whether the company has a significant social, economic or environmental impact on the society around it. /24/ This chapter presents the contents of material performance indicator according to the GRI Guidelines conducted in the client company.

Wärtsilä has an internal guide for CR reporting called Wärtsilä Manual which is created based on the GRI G4 guidelines. It includes various questionnaires of different environmental aspects with specified questions to facilitate the data-collecting process and reporting itself. Since the development work of the thesis is closely related to the Materials questionnaire of the manual, it is on the spotlight in this chapter. The tool that was improved in this thesis work is called Materials Used by Weight and its purpose is to gather data based on the requirements of the Materials questionnaire.

It is a part of the guidelines for environmental reporting for factory and instructs to report the total weight of materials used in production and packaging of the primary products and services of the company during the reporting period. The Materials questionnaire is to be filled and reported quarterly and it consists of three sections based on the usage purpose of the material. The groups are product- and process-related materials as well as packaging materials. /25/



#### **4.5.1 Product-related Materials**

This section requires the reporting of all the materials consumed for the manufacturing of the products in each period. Included raw materials can be natural sources, such as ores minerals and wood that are converted into product or services. Semi-manufactured products or parts, including all forms of materials and components other than raw materials that are part of the final products, are to be taken into account. Left-over materials, such as metal scrap that do not end up in the final product itself are considered as well. All the used materials are categorized in the groups of cast iron, steel, copper, aluminium, other metals, plastics and other. The total amount of used mass in each category is reported in kilos or tons. /25/

#### **4.5.2 Process-related Materials**

Process-related materials consist of all the material consumption that does not end up in the final product but is nevertheless used in the process. It includes also materials, such as sand, of which part will end up as waste. These materials are categorized into three groups; chemicals, sand and other. Chemicals include all the used chemicals in the production, except diesel or kerosene that is used for cleaning components since this information is reported in the Energy questionnaire. All the chemicals are added up and reported in kilos or tons by the mass of their usage. /25/

#### **4.5.3 Packaging Materials**

The final section of the questionnaire comprises all the materials consumed in the packaging processes. Materials are considered as packaging materials whether the package is to be sent to a customer or components transported internally in the company. Material groups to report for packages are metals, plastics, fibre-based, wooden and other. Each material category is reported by the weight of them in kilos. /25/

## 5 RINKI

This chapter discusses the RINKI-organization briefly and the way it is related to the development project. Finnish Packaging Recycling RINKI Ltd was founded in 1997 and is owned by Finnish industry and retail trade. It is a non-profit organization and according to RINKI it offers an easy and efficient way for its customers to implement producer responsibility. In addition, they provide consumers with wide network of the collection of packaging and recycling of glass packaging waste. /5/ RINKI reporting was relevant to include in the thesis because the tool being developed in the thesis is used also when gathering data of used packaging materials in the company.

### 5.1 Producer Responsibility

Companies are bound by law to producer responsibility. Producer responsibility concerns companies that pack their products in Finland and import packed products to Finland, and companies whose turnover is at least one million euros. The purpose of the producer responsibility is to prevent the creation of packaging waste and increase the reuse and recycling of them so that harms for the environment are minimized. /27/

Organizations have three options how to perform producer responsibility in their business. They can either take care of it by themselves and join the producer register of Pirkanmaa ELY Centre or they can establish their own producer organization with other producers. When applying to the producer register, the company needs to find out how it is going to arrange the waste management by its own expense and make sure it complies with recycling requirements. /26, 27/

Alternatively, corporations can join an existing producer organization, which means they transfer their producer responsibility to the organization. There are six producer organizations for packages in Finland which all have a common service company, Finnish Packaging Recycling RINKI Ltd. Information about used packages are reported to Pirkanmaa ELY Centre once a year by both producers that applied to the producer register and producer organizations, which are doing the reporting

for their client companies. If the producer responsibility obligation is neglected, there will be penalty fees for companies to pay /26/

## **5.2 RINKI-reporting**

When companies buy services from RINKI, they make a contract with it to transfer the producer responsibility to RINKI. In turn RINKI states it carries out the packaging management for them cost-efficiently. This arrangement has led to an outcome where almost all the packaging in Finland is recycled. RINKI has already over 4000 companies as customers. /5/

The organization states that buying its services makes carrying out producer responsibility easy and effortless for companies so that they can concentrate on the business itself. It makes the collection of packaging waste and its recycling cheaper for companies, compared to if they should arrange everything by themselves. Packaging data is reported just once a year to authorities, so it does not require too much effort from companies. In addition, according to RINKI being part of it shows companies' stakeholders that they are responsible which contributes their reputations. /5/

Organizations need to report to RINKI all the packaging materials they use in their operations. Materials are categorized as plastic, metal, glass, wood, paper fibres and others. For each category, there are sub-categories that specify the nature of the material as well as whether it ended up to consumer or to companies. The amount of used plastic bags or wooden euro pallets in tons are examples of sub-categories that are to be reported. In addition, from each category it is necessary to report how many tons was imported, exported, used in markets in Finland and reused as packages in Finland. /5/

The client organization of this thesis utilizes the information of the tool, Materials Used by Weight, also as a part of RINKI-reporting, and therefore it was decided to be improved in the same project. The accuracy of the RINKI-report needed to be enhanced and ensured because charging customs of RINKI changed in the begin-

ning of 2018. Previously RINKI billed customers based on the size of their businesses, so the bigger the annual turnover the bigger the invoice was. In some cases, successful companies may use relatively small amount of packaging, for instance if they focus also on providing services. To offer more justified billing system, RINKI decided to bill its customers based on the amount they use packaging material in their operations. Therefore, it is important for the client company to make sure they report the right amount of used packaging materials, and it was the area of RINKI-reporting that needed improving. It would not be economic for the company if the actual amount was much less than what they report. /5/ In addition, RINKI starts performing auditing in client companies, so it is important that reported amounts are based on justified knowledge /27/.

## 6 WÄRTSILÄ AND CORPORATE RESPONSIBILITY

The thesis work was ordered by a client company, Wärtsilä Finland Oy, which is one of the leading companies in the energy and marine markets providing its customers with complete life-cycle solutions. Wärtsilä was established in 1834 and today it operates in over 80 countries employing more than 18 000 employees. In the previous year, 2017, their net sales were in total 4.9 billion euros. They want to provide their customers with maximized value by means of improving the environmental and economic performance of their products and services. /2/

The company's business is divided into three different area which are Energy Solutions, Marine Solutions and Services. The purpose of Energy Solutions is to offer combustion-based power plants, energy storage systems, utility-scale photovoltaic (PV) power plants and liquefied natural gas (LNG) terminals that support flexibility and stability. In Marine Solutions they want to increase their customer's efficiency in marina and oil and gas industry with safe and innovative technologies that are customized to meet customer's exact needs. As for Services, it offers customers life-cycle services all over the world in order to ensure required performance and maximized lifetime of engines. /2/

Wärtsilä defines its purpose as enabling sustainable societies with smart technology. Sustainability is one of the key drivers when environmental, economic and social impacts are carefully considered in everything they do. They are committed to operate in a responsible way in communities they influence and to give back to those communities. They build their excellence upon smart technology that aims at creating innovative and energy efficient solutions with optimized lifecycles. /28/

### 6.1 Sustainability in Wärtsilä

Sustainability has been the focus of significant attention in Wärtsilä in recent years. It has been divided into economic, environmental and social dimensions. Economic dimension concentrates on being profitable and contributing the well-being of society, and thus fulfilling its responsibility for stakeholders. Based on good economic

performance, the company is able to implement responsible behaviour to other sections as well. Environmental dimension covers Wärtsilä's responsibility as providing environmental solutions for its customers and proper environmental management concerning its operations. Responsible business conduct acts as the base of social responsibility. /28/

There are several internal and external factors guiding for sustainable behavior in the company. Wärtsilä Code of Conduct is the very base for their internal sustainability principles. Both employees and business partners are expected to follow these principles and implement them in their actions. Implementation of the principles is strengthened with supporting policies and e-learning material which is compulsory for every employee. Additionally, Wärtsilä has created its own sustainability strategy as well as Quality, Health, Safety and Environmental (QHSE) policy and management system that it is following. Furthermore, the company is committed to follow the UN Global Compact and its responsibility principles. Wärtsilä Finland Oy has certified management systems ISO 9001, ISO 14001 and OHSAS 18001 for verifying the proper management of quality, environment and occupational health and safety within the company. /28/

Like other companies, also Wärtsilä is bound to comply with external requirements for sustainability. Legislation is the priority because otherwise the company could lose its licence to operate. Requirements from investors and customers are important to take into account since based on them the organization can determine the direction for its operations. In addition, non-governmental organizations and other stakeholders such as media has impact on the way the company makes decisions.

Strong sustainability driven development has led to many clean innovations in Wärtsilä. For example, their dual fuel engine improves energy efficiency while Controllable Pitch Propeller reduces exhaust emissions. Their newest engine type W31 is labelled as the most efficient 4-stroke engine in the world which offers the best fuel economy of the engines in its class. Also, their system for zero flaring enables recovery of gas and has cut CO<sub>2</sub> and NO<sub>x</sub> emissions substantially around

the globe. /28/ Earlier this year, 2018, Wärtsilä received recognition for its investment in sustainability as it was listed among the hundred most sustainable large corporations in the world /3/.

Implementing corporate responsibility in operations has been a strategic move for Wärtsilä and has created them several advantages. Instead of seeing the dimensions of sustainability as burdens and threats, they also saw opportunities in them. Therefore, the company aims at improving the environmental performance of its products and services constantly and maintain its technological leadership by using new technologies and collaborating with customers and stakeholders. This way the organization helps their customers to comply with environmental regulations and guidelines which are getting tighter all the time. /28/

Environmental aspect is taken into account both in products and operations itself. In product performance the aim is to improve efficiency, operational lifetime and material selection, reduce emissions and the amount of waste and to consider the whole lifecycle of the product. This way it is possible to reduce the environmental impact of the product and create value for customers while making more profit for the company. Operational performance focuses on improving material and energy efficiency as well as waste and chemical management in all its actions. On top of that, complying with legislation, product certificates and environmental monitoring are the very base of improving the environmental efficiency of the operations. This kind of environmental management allows adjusting operations so that they are always a few steps ahead of tightening legislations, which is good for the reputation and saves money. /28, 29/

Economic aspect is the traditional way of evaluating company's performance, and it is important especially for stakeholders, such as investors, creditors, employees and shareholders. Sustainability strategy has strengthened Wärtsilä's reputation as a responsible corporate citizen, employee and partner, which attracts more customers and leads to savings, and therefore improves profitability. In addition, sustaina-

ble approach has created them a competitive edge over their rivals. Therefore, sustainability strategy plays an important role in the company guiding the decision-making process. /29/

## 6.2 Corporate Responsibility Reporting in Wärtsilä

Reporting practices are very established in Wärtsilä due to the long tradition of reporting. Their first report was published in 2000 and it was named as Environmental report 2000. Since then reporting has settled in the customs of the organization, even though the report changed its name first to Wärtsilä Sustainability Report and in 2006 it was integrated with Wärtsilä Annual Report. The report includes the parent company and all the 32 subsidiaries, as well as manufacturing, service and sales units of each company. /29/

The report is based on the data collected in different methods throughout the year, in every quarter. Each Wärtsilä company is required to fill detailed questionnaires and based on the answers, data for the performance of the environmental and social dimensions of sustainability are collected. The data of economic performance is mostly collected from audited financial accounts. In addition, information is collected from key stakeholders, such as investors, customers, personnel and local societies with questionnaires which help Wärtsilä to identify the importance of different sustainability topics. Overall, material topics are considered to be the most critical ones in Wärtsilä from the sustainability aspect, since their products have impact both on local and global level. /29/ Table 1 presents all the materials used by weight according to Wärtsilä Corporation Annual Report 2017.

**Table 1.** Total material usage of Wärtsilä. /29/

<b>Materials</b>	<b>2017</b>	<b>2016</b>	<b>2015</b>	<b>2014</b>	<b>2013</b>
Total material usage (t)	73 738	84 913	100 767	88 736	91 720
Metals (t)	55 416	59 898	73 285	65 363	69 991
Sand (t)	13 493	18 399	20 915	16 445	16 537
Chemicals (t)	1 575	1 831 *	5 025	5 447	3 865
Others (t)	3 255	3 601	1 542	1 481	1 327

\* A substantial error in reporting classifications was corrected in 2016, meaning that the figure is not directly comparable to earlier years.



The Sustainability Report includes a wide range of information. Therefore, every Wärtsilä company has nominated an individual whose responsibility is to make sure that the collection and consolidation of the data is of good quality and reliable. Wärtsilä has specific guidelines for internal reporting and the Eurostat gives instructions for environmental expense and investment reporting, which help persons in charge of the reporting. All the collected data is reported internally frequently once a quarter, whereas the Corporate Sustainability report is published once a year. The collected data has to be approved first by the management of each Wärtsilä company, after which it is confirmed at the Group level. Last, Wärtsilä's Board of Management approves the contents of the Sustainability Report and it can be published. /29/

The Sustainability Report is conducted according to the GRI Standards and the Reporting Principles for Defining report contents. The scope of GRI that Wärtsilä uses in reporting is Comprehensive, which is the wider option of the two. That is why, the report includes all the General Disclosures of the GRI Standards framework, as well as the sustainability topics that have been identified based on the materiality utilization in the company. /29/

As mentioned before, the sustainability report needs to be reliable so that it can create value to the company and its stakeholders. Therefore, Wärtsilä uses a third-party, PricewaterhouseCoopers Oy, to independently assess if the contents and quality correspond the GRI principles. In practice PricewaterhouseCoopers Oy conducts the assurance by assessing the data management and process on a local level together with an assessment of collected data being relevant and reliable. For estimating how well the reporting guidelines are understood and applied in the organization, site visits and videoconferences have been executed. /29/

## 7 EXAMINATION OF THE DEVELOPMENT PROJECT

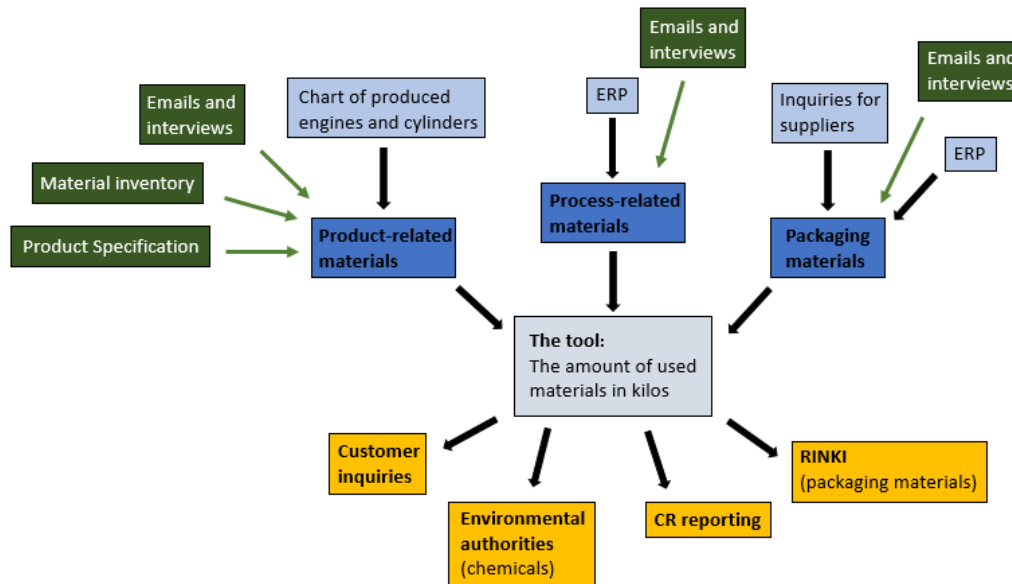
The goal of this thesis work was to develop a tool for the client which would help them to gather information of used materials and to report them in accordance with the GRI guidelines for sustainability reporting. The tool is developed particularly for the Material questionnaire–section that concerns environmental reporting for factories. The tool considers only operations in the factory that is located in Vaasa, but it is important since a significant share of all the material usage of Wärtsilä Finland Oy happens there. All the subsidiaries of Wärtsilä are required to collect information and report their corporate responsibilities. Information from each subsidiary is combined and finally reported together in the CR report of the whole corporate.

It is essential that reported information is reliable for the transparency, trustworthiness and reputation of the client company. This information is also used when assessing the company’s environmental aspects and risks annually. The amount of process–related chemicals of the tool are reported to environmental authorities every year, since it is required for environmental permits. Moreover, customers want to have more and more detailed information of their orders and operations related to them, so data from the tool can be utilized when replying for customer inquiries. Since sustainability reporting changed to be mandatory and the first reports are to be reported in 2018 of the financial period 2017, the timing of this work is very current.

In addition, the criteria of how the RINKI–organization charges its customers changed in the beginning of 2018. Before customers paid for RINKI’s services according to the amount of their turnover, whereas now the invoice is based on the amount of used packaging materials in the companies. So, the client needs this tool also to examine the amount of used packaging materials.

Figure 4 presents how the data is collected for the tool and to whom it is reported forward. The light blue boxes mean the data input that the user of the tool is going to fill in in order to get the materials used by weight as an output from the tool. In

turn the green boxes illustrate the data sources that were only used when developing the tool.



**Figure 4.** Flowchart of the information inputs and outputs of the tool.

### 7.1 Starting Point of the Tool

Wärtsilä has a long experience in sustainability reporting, so they had an existing tool for measuring used materials but, however, it was inaccurate. The tool in Excel had been made in 2009 and some of the information was only based on estimations. The tool had not been updated since its creation so some of its information was also outdated whereas some new information was needed to be added there.

In the old tool, the biggest need for improvement seemed to be with product-related materials. Materials in that section were divided only in ferrous and non-ferrous materials. Another challenge concerned the number of included components and their weights. The tool considered only 13 components in its calculations, and the calculations were distorted because the weights of most of the components were unrealistic. Moreover, the produced engines were separated only in two categories of which the first was engine type W20 and the second group included engine types of W31, W32 and W34. This grouping distorted results even more because with

some components there is a substantial difference in the weights of W31 engines compared to W32 and W34 engines.

Process-related materials consisted of chemicals utilized in the production of engines. The old tool included VOC (volatile organic compounds) chemicals and two other chemicals that were only mentioned by their vendor number. In the production there are more chemicals in use than just those, so the tool missed for example fuels, detergents and cutting fluids. Also, the chemical-section of the old tool was very confusing since chemicals were not mentioned by their exact name and therefore this section needed more clarification.

Packaging-related materials was the part of the Materials questionnaire that needed the least correction. However, it was important to ensure if used materials were still the same and coming from the same suppliers as before since that information had not been updated in a while. The old tool did not report used metals in packages so there was need for investigating if metals were used and if the amount was considerable.

## **7.2 Execution of the Project**

The project included several issues that needed to be taken into account. To make it easier to start working on it, an execution plan was created, as seen in the Appendix 1. The plan helped to identify separate phases of the work and acted as a guideline throughout the project. However, the plan did not include deadlines by which a certain phase should be completed. That was because there was no tight schedule for the work and some phases depended on other people in the company, for instance answers for inquiries. The plan proved to be useful since it offered a way to keep track of the progress and too see if all necessary steps had been taken.

Before starting the development project itself, a lot of information concerning sustainability reporting and GRI reporting was gathered in order to fully understand the concept in which the project was related to. The Wärtsilä Manual for GRI reporting includes instructions for the content that needs to be reported, so it was

examined carefully in order to have knowledge of the matters required in the development project. Next, the old tool was handed over to the thesis worker and so its evaluation started. Based on the evaluation, its defects and development areas were charted and an execution plan was carried out. In addition, before beginning the work itself, it was necessary to make sure that the thesis worker had all the needed equipment and rights to the internal systems, in order to be able to implement the plan without external disturbances.

The project started by focusing first on product-related materials, in other words the components of engines. First of all, it is good to be aware of the expressions W20, W31, W32 and W34 when talking about engines. This expresses the cylinder bore of the engine in question, for instance the cylinder bore of the W20 engine is 200mm whereas it is 340mm in W34 engine. In addition, each engine type has several models because the number of cylinders and fuel type varies in engines. In normal cases, engines in the client company has 6–20 cylinders. The more cylinders the engine has, the bigger it is and the more power it can produce. Engine types based on used fuel are diesel and gas as well as gas diesel and dual fuel that can use both gas and liquid as fuel. Different fuel types might cause deviations in the structure of engines and therefore the same components might be of various weights. Therefore, depending on the type and size of engines, the weight of components may vary significantly. Usually W20 engines are substantially lighter than the others.

The limits of the development project needed to be marked before beginning to examine the components. Wärtsilä produces a wide range of engine types, so going through all of them was not possible in the timeline of this thesis work. It was agreed with the client company that from each type of engine based on its cylinder bore, the biggest and the smallest engines were to be chosen for the work. Then, the average weights of the components were to be calculated from these two chosen engines. The engines that were chosen to be used in the work can be seen in the Table 2 below.

**Table 2.** Typical sizes of smaller and larger scale engines.

Engine type	The smallest engine	The biggest engine
W20	W6L20	W9L20
W32/W34	W6L32	W20V32
W31	W10V31	W20V31SG

When determining the usable engines, there was also an issue related to the engine groups that would be used in the work. As mentioned before, in the old tool engines were divided only into two groups, W20 and W31/W32/W34. The client wanted to have W31 engine as a separate group in the work since their structure differs from other engines. However, the client left it to the thesis worker to decide whether the engines W32 and W34 were necessary to separate from each other or not.

Determining whether to separate the two engine types, was conducted by examining the components from both engines. In order to compare the engines, usable engine models needed to be decided. W20V32 and W20V34 were chosen because they are one of the most common engine types of the company. In the comparison process each time the same components were chosen from both engines and then the weights of the components were compared. As a result, it was determined that it was unnecessary to separate these two engine types from each other because there were no significant differences in the weights of their components.

### 7.2.1 Components

As a tool for investigating components, an internal product specification program was used. It was the most convenient tool for the purpose since it includes all the manufactured products with their components and indicates also the weight of each component. Furthermore, inquiries of component lists were made for engine experts concerning the components of the W31 engine because it is quite a new product and

not many of them have been yet manufactured. Occasionally more detailed information was needed of the components, in which cases meetings or Skype-calls took place with engine experts.

The client's requirement was to increase the accuracy so that the number of components included in the calculations of the tool would be at least 20 instead of the previous 13 components that were used. Determining the components for the tool was started by going through all the components that were used in the old tool and checked if they were relevant and if their weights were the same or needed correction. The components in the old tool were so called basic components, so they were necessary to keep in the tool and use for the calculations. However, one component, the controller, was removed from it because it was very light and therefore it did not have a significant role in the reporting of weight of the materials.

When examining the weights of the remaining components, it turned out that there were huge differences between the weights recorded in the old tool and the results of investigation. For the W32/W34 engine type none of the weights were exactly same as recorded previously and the smallest variation was 19 kg while the biggest was 2336 kg. All in all, in 46 % of the old components the difference compared to new ones was more than 200 kg. Half of the new weights were lighter than previously while the other half was heavier. Appendix 2 shows the difference in weights of the components for the engine type W32/34.

For the W20 engine two components had the right weight in the old tool but, on the other hand, the biggest variation between the weights was 4529 kg. In total 30% of the components had a variation of at least 200 kg for the lighter or heavier direction. The variation of the weights is illustrated in Appendix 2.

The next step was to start studying the product specification program and received component lists in order to see which components were essential to add to the tool. The W32/W34 engine group was first examined because it is one of the most common engine types and its components are substantially heavier than in the W20 engine, while the W31 engine has a partly different structure and requires special attention. All the components of the previously determined lightest and heaviest

W32 engines were gone through one by one to see how heavy they are. For this engine type the weight limit of a component was set to 200 kg while for the components having one piece per cylinder the limit was set to 20 kg.

By these criteria, 13 components more were found for the tool and they were added for each engine group. Actually, the number of included components is even higher but for some components weights of two components were united to keep the tool clearer, as well as if the other component was a supporting or connecting component for the main component. Furthermore, structural differences caused some difficulties because not all the components are included in all the engines similarly. Therefore, in the updated tool there is no weight for certain components. For instance, the W32/W34 and W31 groups included charge air systems and a charge air cooler separately while in the W20 engine the charge air cooler itself includes the charge air system. In these kinds of situations, the help of specialists in the company was needed. Then, all the new components were examined first for the W20 engine and later for the W31 engine and their weights were added to the records. The components were also divided into two groups, one group included components per engine while the other one consisted components per cylinder.

When all the 25 components were defined and their weights were on the record, it was time to find out the material of which each component was made. With most of the components that was easy since the information was visible in the product specification and they were made of only one material. Some components inquiries to experts had to be made to have reliable information. Components such as generator, turbocharger and charge air system were more complicated because they consist of several materials.

For solving this problem, the component list of W31 was used because it included materials used for most of the components. The percentage value of each material in a component was calculated and the same value was used for each engine group. However, with the components that had no information of material distribution available, estimations had to be made based on the component drawings and the knowledge of the materials of different parts.



In addition to components, product-related materials include materials that do not end up in the final products but are left-over. The company produces yearly a significant amount of metal scrap as a by-product from its manufacturing. Therefore, it was necessary to add created metal scrap in the tool to the total amount of cast iron used. Information concerning the amount of metal scrap is filled in the tool manually and it can be found in the waste reports of the factory.

### **7.2.2 Chemicals**

Only chemicals are considered in the process-related materials since sand and other materials are not used in the engine manufacturing process. The chemical section of the Materials questionnaire needed to be updated and all the used chemicals had to be added there. As the old tool had only two chemicals and VOC-chemicals included it was necessary to increase the accuracy and reliability of the reported information. In the production process there are several other chemicals, such as fuels, oils and detergents in use. Therefore, the most critical issue in this section was to find out which the chemicals were used in the production.

An inquiry of the matter was sent to a person specialized in the chemicals used in processes. It turned out that it was very easy to get all the needed information of this issue. The answer for the inquiry was comprehensive and included all the necessary information of the chemicals used.

The factory uses four different types of detergents for washing machines and four types of cutting fluids. In addition, two lubricants are in use, one for gas engines and one for diesel engines. Three types of corrosion inhibitors and four types of defoaming agents were also used though their usage is not as frequent as the use of other chemicals.

Fuels are also used in the production process, especially in the test run. Information of the fuels used in Wärtsilä was drawn from an internal chart. The used fuels are heavy fuel oil (HFO), light fuel oil (LFO) and liquefied natural gas (LNG). VOC-chemicals remained as one element in the section like they were in the original tool.

### **7.2.3 Packaging Materials**

Wärtsilä uses a lot of packaging materials for different purposes. The most common packaging material is wood, which is used as boxes or pallets for transportation. Cardboard is used in packages, for instance inside wooden boxes, to ensure that the product inside will not get damaged during the transportation. Plastic packages are mostly used for components that need a protection against corrosion. A small portion of packaging materials include steel straps that can be used for holding components of the package together.

The section of packaging material required the least attention of the three sections. Basically, it needed to ensure that the old information was correct and see if there were any changes in the materials used or in suppliers. For this purpose, a meeting with a few employees from logistics was arranged.

The outcome of the meeting was that the same packages are still in use and they come from the same suppliers as before. The packages are made of varied materials such as plastic, fibre-based and wooden packages. Additionally, it was discovered that metal is used as well for some packages, it needed to be reported and was added to the tool.

Another observation, concerning RINKI-reporting, was that wooden pallets are used much more in the company than it was estimated. Previously the company had reported to RINKI that most of the pallets are exported with products to abroad, but in the meeting, it was discovered that most of the pallets are reused in Finland and products exported to abroad are packed in wooden boxes. This result gave a better accuracy for the reporting of exported and reused packaging materials for RINKI.

### **7.2.4 Creating the Tool in Excel**

When all the necessary information was gathered and modified in the proper form, it was time to start building the tool in an Excel table. The old tool was rather incoherent so one of the most important requirements for the new tool was to make it clear. In addition, the tool needed to be easy to use and have intelligible instructions.

Material-related information is reported once a quarter so four similar sheets were created, one for each quarter. The fifth sheet is a summary sheet where all the information by each material from each quarter was summed up. This facilitates the comparison of different quarters and distinguishes the periods when some materials were used more than normally.

The product-related section in the Excel table included a lot of information and it took the most time to make. As seen in Appendix 3, first all the components and their materials were listed. Then the mass of that component was mentioned for each engine group and next to them were left columns for the total mass of all the produced engines. For components containing several materials, particular material masses were calculated in the total mass column.

In the header of the table empty spaces were placed where the user is to fill the number of manufactured engines and cylinders in the period. Based on that information the table is programmed so that it will calculate the materials used in one engine group as well as the total amount of material used for all the engines. Materials were categorized based on the GRI guidelines as follows ; cast iron, steel, copper, aluminium, other metals, plastics and other.

The table for process-related materials, in other words for chemicals, was simple to create. All the used chemicals were listed there and an empty space was left next to each chemical which is to be filled with the information how much of it has been used. First, there was a thought of creating a table that would search the information automatically about the usage amounts. That information is found from the Enterprise Resource Planning (ERP) system and the information of different chemicals is behind different authorization rights. Therefore, it turned out to be rather complicated to have an automatized system for the chemicals table, so it was agreed that the user would feed in the information there manually. The material numbers of each chemical were added to the table to facilitate the user to find specific chemical information from the ERP.

Packaging materials were as well gathered in a table in the Excel sheet. They were categorized by the packages that are received from suppliers. In other words,

wooden boxes were one group, other wooden packages one, plastic goods had their own group, plywood boxes and plywood board both had their own group and so on. Packages come from two suppliers, so they were listed under the name of supplier they come from to make it clearer. The information about used packaging materials is fed manually to the tool because the information is available only by asking each supplier separately to send the list of used materials by e-mail. When information is fed to the table, it calculates how much metal, plastic, wooden and fibre-based packages are used in the given period.

After the base of the tool was ready, it was given finishing touches by focusing on the layout, appearance and functionality. Colours in headers make the table easier to read. Also, to clarify the cells that are needed to be filled by oneself, are marked by orange colour. In order the tool to be as easy and smooth as possible to use, it needed instructions. The instructions guide the user to fill the right cells and to find the information for the cells from right places to save time and energy. A few comments were also added in the Excel concerning the component table. There were empty cells left in the table since some engines did not have all the components. The comments explain the reason they are empty in order to add transparency as well as making it easier in the future to develop the tool when there is information about each component.

### **7.3 Testing of the Tool**

From the beginning it was estimated that the development project would have a great impact on the quality of the information reported, especially about the product-related materials. When the project proceeded, the difference could be seen clearly since the information in the old tool was inadequate compared to updated information. Information related to chemicals was evaluated to be improved also relevantly because the scope of used chemicals was widened for the new tool. The smallest difference was expected to be in the section concerning packaging materials.

The end of the first quarter was met during the final stage of the thesis work, which gave an idea of testing the tool in practise. That gave an opportunity to see differences and improvement of the tool in case correction and adjustments were needed in the new tool. For the test, the same information input was fed in both tools from the time frame between January and March.

### **7.3.1 The Section of Product-related Materials**

The testing was started by feeding the tool product-related information of the produced engines and cylinders in the given time. The difference was significant since the old tool contained only ferrous and non-ferrous materials while the new one included also, aluminium, copper, other metals, plastics and others. The result showed that the new tool was overall 37% more accurate when calculating the total mass of used materials for the products. For the materials that were not included in the old tool, the improvement of accuracy was 100%. For ferrous materials (cast iron in the new tool) the change was 7% but unlike other materials, for this material the amount of usage declined. Non-ferrous materials (steel in the new tool) increased promptly by 94%.

The reason for the slight decrease in ferrous materials and the increase in non-ferrous materials can be easily explained when looking at the old tool. There the materials of all the components were marked as ferrous, and from that amount 3.85% was decided to be reported as non-ferrous materials. There was no proof of that amount being based on facts rather than on rough estimations. In reality the company has several components that are fully or partly made of steel and therefore the weight difference between the tools was so huge.

### **7.3.2 The Section of Process-related Materials**

The old tool in Excel included only VOC chemicals and two other chemicals that were not mentioned by their product name. After adding the tool all the other frequently used chemicals, the difference in the amounts of used chemicals increased steeply. All in all, the amount of used chemicals became 250 times bigger than it was in the original tool.

The matter that influenced the change in the amount of chemicals was the addition of fuels to the tool. The use of fuels is outstanding and altogether it comprises 98.98% of all the chemicals used in the first quarter. The second most used chemicals were VOC chemicals but compared to the use of fuels, the amount of them were very small, only 0.45%. Lubricants formed 0.30% of all the chemicals, while detergents were 0.12%. The most minimal categories were cutting fluids by 0.06%, corrosion inhibitors by 0.06% and defoaming agents by 0.03% share. The section of packaging materials was tested as well but there was no difference to the old tool. That is because the steel strap was the only added category and its consumption is so little that it is not ordered from suppliers every quarter.

## 8 CONCLUSIONS

The concepts of corporate responsibility and corporate responsibility reporting were introduced in the beginning of the thesis so that the reader would get a wide understanding of them and their relation to GRI. Only then the importance of the development project of the material performance tool could really be comprehended. RINKI-reporting does not concern directly GRI, but it is a part of companies' corporate responsibility since the legislation obligates them to implement producer responsibility.

The world is in a critical period right now with ecological crisis, so more focus is set on the companies and the way they conduct their businesses. It is not enough to be successful company by making big profits, but today saving the environment and natural resources as well as respecting human rights are factors that are part of companies' success. The transparency of the company is important for its stakeholders, so CR reporting has become a must for companies in order to keep their stakeholders content. Reporting according to the GRI Guidelines has facilitated companies' burden in the reporting process by helping them determining all the relevant information that should be reported.

The original tool in Wärtsilä, which was used for material performance reporting, was also created according to the reporting requirements set by GRI. The change in legislation concerning CR reporting speeded up the need for updating the tool and making sure the collected data was realistic. Also, the change in reporting requirements of RINKI-organization made it necessary to improve the tool.

There were a few limitations related to the development project of the thesis. The biggest focus in the project was on product-related materials which required a lot of research and consulting with employees. From the beginning it was clear that it was impossible in the given time frame to make the tool 100% accurate, so the wanted accuracy needed to be decided before starting. In the research phase difficulties arose because different types of engines had different components or different names were used for same components. When creating the chemicals-part of

the tool in Excel, authorization problems in the ERP caused a change in plans, which limited the user friendliness of the tool a bit.

Despite the limitations, the improved tool turned out to be much better than the old one. The biggest improvement was made in the product-related materials section, since the accuracy of that section was increased by over one-third. Moreover, the scope of used materials is wider and more realistic now, being based on carefully examined information unlike it was before. Another significantly improved section of the tool is process-related materials, in other words chemicals. It was surprising how substantially the amount of chemicals grew after adding other chemicals besides VOC chemicals, especially fuels. The smallest improvement could be seen in the packaging materials section of the tool due to its good original information.

The improvement concerning the RINKI reporting was not significant since reported packaging materials were the same as before, apart from steel straps that were added to the tool. The most important matter to be done for the RINKI reporting was ensuring if the same packaging materials were used. However, a surprising discovery was the use of wooden pallets. Most pallets are actually reused in Finland rather than exported abroad, and that issue can be clarified in the next RINKI report making it more precise.

It should be remarked that in the next CR reports the amount of all materials used, and especially used metals and chemicals, are much higher than in the previous reports. At first it might make stakeholders, including authorities, wonder why the change is so great and if there were changes made in the production processes. Nonetheless, no significant changes happened in the production processes, but now the report simply tells the amount of used materials more realistically.

The Used materials by weight-tool does certainly not tell the amount of used materials with 100% accuracy yet. It might be impossible to get the accuracy up till one hundred per cent ever but that should be the goal when developing the tool in the future. When improving the tool further in the future, the main focus should be on the product-related materials.



There are a few ways to improve the accuracy. One is that all the missing components could be added to the tool, even though most of them do not weigh much and therefore they are not crucial. Another way is that the types and sizes of engines could be better taken into account. Each engine type has several sizes of the engine, which means a different amount of materials used for them. The tool could be made very accurate by adding material data separately of each engine type and size. However, it would take a lot of time and resources, so it needs to be considered carefully if it is increasing the accuracy enough to be worth it.

For the chemicals, the accuracy could be increased by considering also chemicals that are used only occasionally. Currently the tool takes into account all the most used chemicals but still there are some chemicals that are left outside. Nevertheless, the improvement in the tool would be only minimal because most likely the use of those additional chemicals would be very little compared to the chemicals that were added to the current tool.

Packaging materials in the tool comprise at the moment all the packaging materials that are used, so it would be very difficult to improve that part. What comes to the RINKI report, it would be possible to improve its accuracy by focusing on reusing and recycling parts of the report. It could be better monitored that how big part of different packages are reused and recycled.

In addition to CR and RINKI reporting, gathering more precise material information will help the client organization to carry out the yearly evaluation of environmental aspects. It includes, for instance, evaluating impacts of the materials used in the products. More accurate chemical information in turn facilitates performing a report for environmental authorities once a year. That is because the data is collected more precisely each quarter, so there is no need for doing a huge research separately each year before the reporting deadline.

Altogether, the outcome of the development project was very good and makes a great difference in the future CR reports. The project required a lot of research but with right tools and mindset it could be done successfully. Both parties, the thesis worker and the client company, were satisfied with the final outcome of the project.

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## APPENDIX 1. Plan of the execution

### **Plan of the Execution**

- Determine the limits of the work and the accuracy wanted for the outcome.
- Examine engine types of W32 and W34 to find out if there is a significant difference in the weights of their components. Based on the result decide if it is better to separate them into two groups or keep together.
- Decide which engine types to include in the calculations to get as realistic outcome as possible.
- Investigate which are the most relevant and heaviest components in engines that should be included in the calculations.
- Find out of which materials these components are manufactured.
- Calculate the average weight for each component in each engine group.
- Divide the chosen components into two groups based on their quantity: 1 per engine and 1 per cylinder.
- Inquire which are the used fuels, detergents and cutting fluids in the production and where to get the amount of their usage.
- Arrange a meeting with colleagues from logistics to find out which material are used in packages; which suppliers provide packaging materials and where to find records about the amount of used packaging materials.
- Based on the gathered information, begin building the new tool in Excel.
- Make sure the new tool includes all the required information for GRI reporting, that is available in the company.
- Add user instructions to the tool.
- Make sure the tool is clear and easy to use.
- Compare the new tool with the old one to see the level of improvement.

## APPENDIX 2. Weight differences of components between the old and new tool

## APPENDIX 2. Outcome of the development project