



Oiconomy / RVO Pilot Project - Report



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Commissioned by Rijksdienst voor Ondernemend Nederland RVO



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Word of thanks

The UU/Oiconomy teams expresses their gratitude to the partners in the piloting companies and their suppliers for their trust, motivation to join and experiment in their companies and with their key suppliers, as well as the staff at RVO/FBK for their willingness to enable us to make the steps towards market introduction of the innovative approach.



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Executive Summary (1)

- In this project the Oiconomy Pricing method has been applied by 3 companies on one of their products (pepper, a stone kitchen countertop and a pack heater). They calculated the hidden cost for all sustainability aspects in the full value chain (planet, people & prosperity). Hidden costs are calculated as prevention costs, representing costs of avoiding negative externalities. As far as possible this calculation is based on the actual performance data of the main partners in the supply chain. First tier suppliers collaborated in these calculations. The results instruct the supply chain partners in key points for improvement.
- These hidden costs are € 32,44 for 1m² of stone kitchen countertop, € 130,21 per pack heater (medical device) and € 1,03 per pepper jar.
- The absence of child labour could not be demonstrated in the clay and felspar mines in Turkey and Ukraine and neither on the pepper farms. This led to the allocation of € 0,12 per 1m² kitchen countertop and € 0,004 per pepper jar, in order to mitigate child labour. Additionally, child labour takes place in the supply-chain of steel production, costing € 6,88 per pack heater to mitigate.
- Within the supply chain of a pack heater, it was found that the employees working in steel workshops earn 53% beneath the fair minimum wage. Raising their salaries results in an allocation of € 25 per pack heater.



Executive Summary (2)

- The Oiconomy Pricing method also rewards positive externalities, when they are not reflected in the market transaction of selling the product. The positive externalities in the case studies are € 6,89 per m² natural stone kitchen countertop, € 17,65 per pack heater and € 0,89 for pepper.
- The pilot companies evaluated the Oiconomy Pricing approach as a very useful tool to analyse their supply chains and to open a dialogue with their suppliers on specific improvement options for various sustainability aspects.
- The experiences of the participating companies show that the Oiconomy Pricing method is a useful innovation in the field of corporate and product sustainability performance measurement. It goes beyond the traditional practice of LCA of product by integrating all sustainability aspects (PPP), and presenting it in monetary terms with a focus on prevention.
- The Oiconomy Pricing method is in the starting phase of market introduction. The pilot version of the assessments tool has been refined, based on the feedback and experiences in this pilot study.



1. Goal and objectives pilot project

Goal

Utrecht University/Oiconomy (UU) developed a tool for companies to map out the hidden costs in their international supply chain. These hidden costs include costs for the prevention of environmental and social impacts in their supply-chain, such as child labour and the prevention of environmental damage.

In this pilot three companies, which also implement a project to address child labour with the support of the Fund against child labour (FBK), will be guided in the application of the Oiconomy Standard and the Oiconomy tool.

The pilot will test applicability of the method and identify the potential role of this tool in the FBK and RVO policies.

Objectives

- To develop exemplary case studies of the application of Oiconomy Standard, version September 2021.
- To show hidden costs associated with social and environmental harm in the supply chain of (Dutch) companies. Make prevention and remediation costs for child labour visible and measurable.
- To optimize communication on the Oiconomy Standard and the Oiconomy tool with participating companies.
- To apply Oiconomy Pricing in full scope.

1. Goal and objectives pilot project

Deliverables

- Collaborate with 2-5 case study companies, using the Oiconomy tool themselves.
- Assist participating companies in implementing the Oiconomy tool correctly.
- Provide a specific child labour and living wage related summary of the case studies.
- Report on findings of the pilot, follow-up, recommendations for RVO and FBK.





2. Key principles Oiconomy Pricing

The problem and solution

In the 21st century, welfare in the developed world grew to an astonishing level. However, the economic activity caused undesired repercussions on Planet, People and Prosperity. These challenges include child labour, persistent poverty, climate change, biodiversity loss, and depletion of scarce resources. This problematic complexity is illustrated by the 17 Sustainable Development Goals (and 169 sub-goals) agreed upon in the United Nations.

Many companies are formulating ambitions to become fully sustainable, setting their goals for zero or even positive climate impact or becoming fully circular. However, an integral approach to sustainability is necessary to tackle all sustainability goals simultaneously. As a solution for these needs the **Oiconomy Pricing methodology** was developed. It presents a practical tool for companies which enables them to make a full triple-P spectrum assessment together with their main suppliers, in the standard monetary language in the market. This assessment identifies and monetizes the hidden costs of products. Oiconomy Pricing is applicable to any company regardless of size, location or industry.

Preventative character

Oiconomy Pricing calculates the negative hidden costs on People, Planet and Prosperity exclusively through costs of prevention. The costs of prevention express the costs necessary to prevent any negative impact from happening. This is in contrast to many other well-known tools, such as LCA, that express damage done to the environment. However, we believe that knowing the prevention costs is a more practical approach, as it gives companies insight on the financial consequences of making their product fully sustainable.

Through the preventative character, producers together with their suppliers analyse the costs that should have been spent to avoid any of the damage that the product causes during its entire lifecycle.

This method prepares for a real price economy, in which the most sustainable product is also the cheapest (as the cost necessary to make the product fully sustainable is the lowest). Even though products will be more expensive, the total costs for societies will be far lower, preventing the current forms of damage.



2. Key principles Oiconomy Pricing

Hidden costs measured

Hidden costs are identified for all sustainability aspects, in line with the [17 UN Sustainable Development Goals](#). Oiconomy Pricing has included more impact categories and indicators than any other sustainability assessment to date. By including all aspects, situations of burden shifting are avoided (where one reduced impact increases another). Oiconomy Pricing measures hidden costs of the following aspects:

Planet

The planet pillar calculates the preventative costs for:

- Zero emissions of harmful gasses/substances to air, soil and water (bulk gasses, toxic emissions and agri-chemicals);
- Use of renewable resources instead of virgin (scarce) resources;
- Preservation of biodiversity;
- Efficient land use for food production;
- Sustainable disposal of waste and optimized lifetime of product.

People

The people pillar measures the preventative costs for:

- Reduced human health risks;
- Fair remuneration;
- Fair inequality between lowest and highest salary within company;
- Sufficient contribution to health insurance, personal development and pension plans;
- Ensuring occupational health & safety;
- Mitigation of child labour.

Prosperity

The prosperity pillar measures the preventative costs for:

- Fair payment to suppliers;
- Responsible financial management (including taxes);
- Prevention of corruption & conflict.



2. Key principles Oiconomy Pricing

Bonus aspects measured

Besides measuring (negative) hidden costs Oiconomy Pricing also measures positive costs as a result of the activities of companies. A positive externality occurs when a third-party benefits from activities or consumption of a product without contributing to the (full) costs of the transaction.

Strict criteria for allocation of positive costs are formulated in the [publication on assessment of positive impacts](#) by Pim Croes and Walter Vermeulen. Companies can receive positive costs on among others the following indicators:

- Beneficial products sold below cost price (e.g. medicines for the underprivileged).
- Quantity of captured CO₂ (e.g. in organic agriculture). Only the proven captured CO₂ in the last year (calendar or current date to date) may be included.
- Recycling of disposed products from other organizations.
- Development of environmental sustainability enhancing products or technology.
- Restauration and/or long term protection of natural ecosystems or upgrading of soils/land.
- Contributions to the local social development around the organization.
- Provision of medical or mental care (not the insurances).
- Protection of cultural heritage and indigenous people or stimulating cultural activities.
- Costs from providing micro credits below cost price.
- Cancellation of debts to the underprivileged.
- Capacity raising education to others than those working for the organization.
- Employing people with distance to the labor market.
- The surplus of paid wages above the Fair Minimum Wage in the 20% poorest countries in the world.
- Infrastructural investments or services without negative environmental or social impact and without economic benefits for the organization itself.



2. Key principles Oiconomy Pricing

Features of the tool

Scoping

In order to measure the hidden cost associated with the product along its life cycle, supply chain partners upstream and downstream have to measure their hidden cost. In order to determine which supply-chain partners need to be included the **80% rule** applies. The 80% rule entails that materials or services (and their corresponding supply chains) that fall within 80% of the purchased value of the final product need to be included in the assessment and traced to the origin (farming or mining).

Example:

- Simple: For 1 kg of green coffee 80% of the purchased value of coffee is from buying the coffee beans from farmers. This means that only the supply-chain of coffee beans needs to be included.
- More complex: 80% of the purchased value from 1 jar of white pepper comes from the pepper, the jar and the cap. This means that the supply-chain of pepper, the jar and the cap needs to be included.

Transferring hidden cost along the supply-chain

The suppliers that fall within the 80% rule also need to calculate their hidden costs. These hidden costs are expressed in a virtual monetary unit, the “ESCU” (Eco Social Cost Unit). ESCU’s can be transferred into any currency. Suppliers only must transfer the amount of ESCU’s on each on the impact categories to the next actor. This ensures that companies do not have to disclose any sensitive production information.

Data availability

In the Oiconomy Pricing Assessment companies are challenged to collect two types of data:

- Performance data: data expressing the environmental, social and economic performance of a company (e.g. amount paid to employees and kWh used).
- Prevention data: data that expresses the cost of a preventative measures (e.g. installing solar panels).

Oiconomy Pricing aims to gather as much company-specific data as possible. However, in the case that an upstream suppliers is unknown or does not collaborate generic database sourced data is used.



2. Key principles Oiconomy Pricing

Added value for users

For a company, knowing the Oiconomy Price of its products and services gives them new opportunities:

- All sustainability impacts in the value chain are identified in terms of prevention: what should be done to avoid negative impacts. Costs of mitigation measures can now be discussed in negotiations with suppliers and they can jointly decrease the hidden costs.
- The tool gives a concrete score, representing the cost-distance to sustainability and goes beyond yes/no sustainability scores or simple narratives about sustainability plans.
- Because of this comprehensive nature (17 UN SDGs), they will be prepared for prevention solutions in all aspects.
- Instead of the mostly generic and limited impact-based nature of current LCA systems, their supply chain actors can calculate their own specific sustainability score.

- It offers armonized assessment and reporting throughout the supply chain and with all suppliers that they require to use the system.
- Various expenditures benefitting society, under some conditions, can be allocated as bonus-ESCU's.

After widely implementing the Oiconomy system:

- By comparing the hidden costs with the average in their markets, users can display their top-tier performance.
- In a widely used Oiconomy system, purchased products can be selected based on their hidden costs.

See for all details: <https://oiconomy.geo.uu.nl>



3. Steps in calculating hidden price of products

1. End-producers or retailers take the lead in applying the Oiconomy assessment.
2. ESCU's are requested from suppliers or a selection of suppliers.
3. Each (selected) value chain partner calculates its own ESCU's and keeps its own bookkeeping, filling the Oiconomy questionnaire in the tool.
4. The aggregated information about ESCU's is transferred to the next value chain actor, comparable to normal price build-up in the supply chain.
5. The end-producer makes the final calculation. Only end-producers include the ESCU's for the use- and end-of life-phases of the product.

In the future certification will guarantee the trustworthiness of the calculations. All participants agree to cooperate with unannounced audits (when results are communicated externally).



4. Case study 1: Arte Groep

Company: Arte Groep

Location: Helmond, The Netherlands

Product: 1 m² stone kitchen countertop (exact product properties are not disclosed)

Timeframe: Data from 2020

Included impact categories: Pollution & Climate, Depletion of scarce materials, Land use, Biodiversity & land degradation, Waste, Labour, Economic responsibility, Bonus

Case description: Arte is a company that provides high quality stone kitchen counter tops. Their production facility is based in Helmond. They supply to over 200 stores in the Netherlands. Arte produces countertops for kitchens made from granite, composite, ceramics and Dekton.



4. Case study 1: Arte Groep

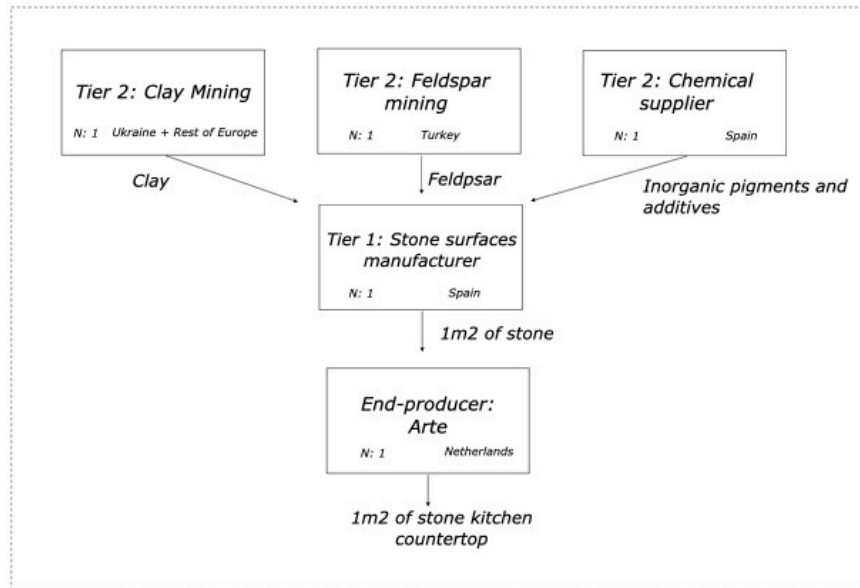


Figure 4.1 : Scope of assessment: included value-chain partners and outputs

Scope of assessment

The supply-chain of the stone countertop was traced back by including 80% of the purchased value. This identified the most relevant supply-chains for stone (Figure 4.1).

In order to produce the stone countertop, clay, feldspar and various other inorganic pigments and additives are procured. These materials are mined at various location: clay is mined mostly in Ukraine; Feldspar is mined in Turkey and other additives are from Spain. The producer of the stone surfaces subjects these materials to further processing: grinding, pigmentation, decoration, shaping and thermal processing. The stone slabs are then transported to Arte, where the slabs are cut, polished and provided with plastic and foam underneath the countertop.

4. Case study 1: Arte Groep

Breakdown hidden costs

The total hidden costs of 1 m² of stone countertop is **€ 32,44** (Figure 4.2). The sales price of 1 m² stone countertop is **€ 912** meaning the hidden costs are adding **3,56%** onto the sales price.

The main negative hidden costs come from the category **Pollution & Climate**. *Pollution & Climate* measures the cost to prevent polluting emissions to soil, air and water. Most of the costs come from the manufacturing process and transport of the stone surfaces producer (€ 5,15), other costs include the energy usage of Arte (€ 1,54) and the mining operations of clay and feldspar (€ 2,41 and € 0,85).

The second biggest category is **Labour**. Labour measures fair wages, fair inequality and other labour conditions. The bulk of the costs come from the stone surfaces manufacturer in Spain as they could not demonstrate the absence of various labour aspects.

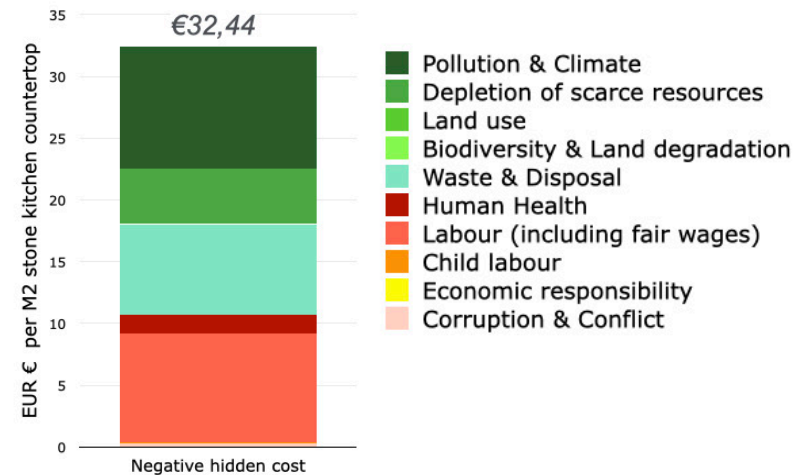


Figure 4.2: Break of negative hidden costs per m² stone countertop

There is a high risk of child labour in the feldspar and clay mines in Ukraine and Turkey. The lack of demonstrated evidence of the absence of child labour led to the allocation of €0,12. € 0,12 is the amount necessary to replace the children with adults earning the fair minimum wage.



4. Case study 1: Arte Groep

In the category *Waste & Disposal*, the cost-distance to sustainable disposal is measured for both processing-waste and end-of life waste. Negative costs emerge from the end-of-life disposal as the demolition of the countertop creates inert waste (€ 4,20).

Furthermore, hidden costs found include cost to prevent the depletion of scarce resources. The stone surfaces manufacturer uses a lot of fossil resources, that lead to negative costs of € 1,33. Additionally, the water consumption for 1 m² of countertop is 0,17 m³ and is extracted in a water-scarce area, which leads to negative hidden costs of € 3,09.

Other hidden costs that were found include costs to prevent *Corruption & Conflict*. According to the Corruption Perception Index, Ukraine and Turkey are sensitive to corruption. No evidence was demonstrated that the clay and feldspar mines have governance systems in place to prevent corruption. This leads to negative costs of € 0,25.

Besides negative hidden costs, positive costs were calculated (Figure 4.3). Positive costs are based on actual company spending, benefitting others than the ones involved in the transaction. Positive costs of € 6,89 were found, which was spent by Arte and by the stone surfaces manufacturer. Among other things, Arte invested in extra preventative medical care for their employees (category: *Social Responsibility*), and set up the Responsible Stone Foundation that aims to eradicate child labour in the communities nearby stone quarries by supporting quality education (category: *Economic Responsibility*).

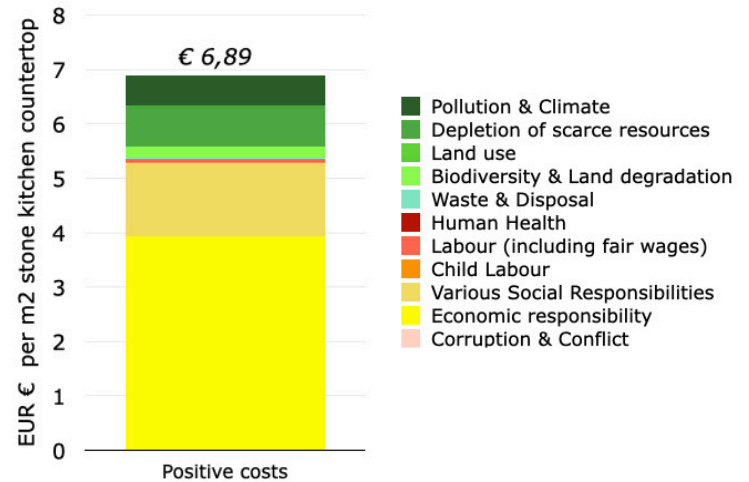


Figure 4.3: Positive costs per m² stone countertop

4. Case study 1: Arte Groep

Figure 4.4 shows a breakdown of the negative hidden costs (above 0) and positive costs (below 0) per supply chain partner.

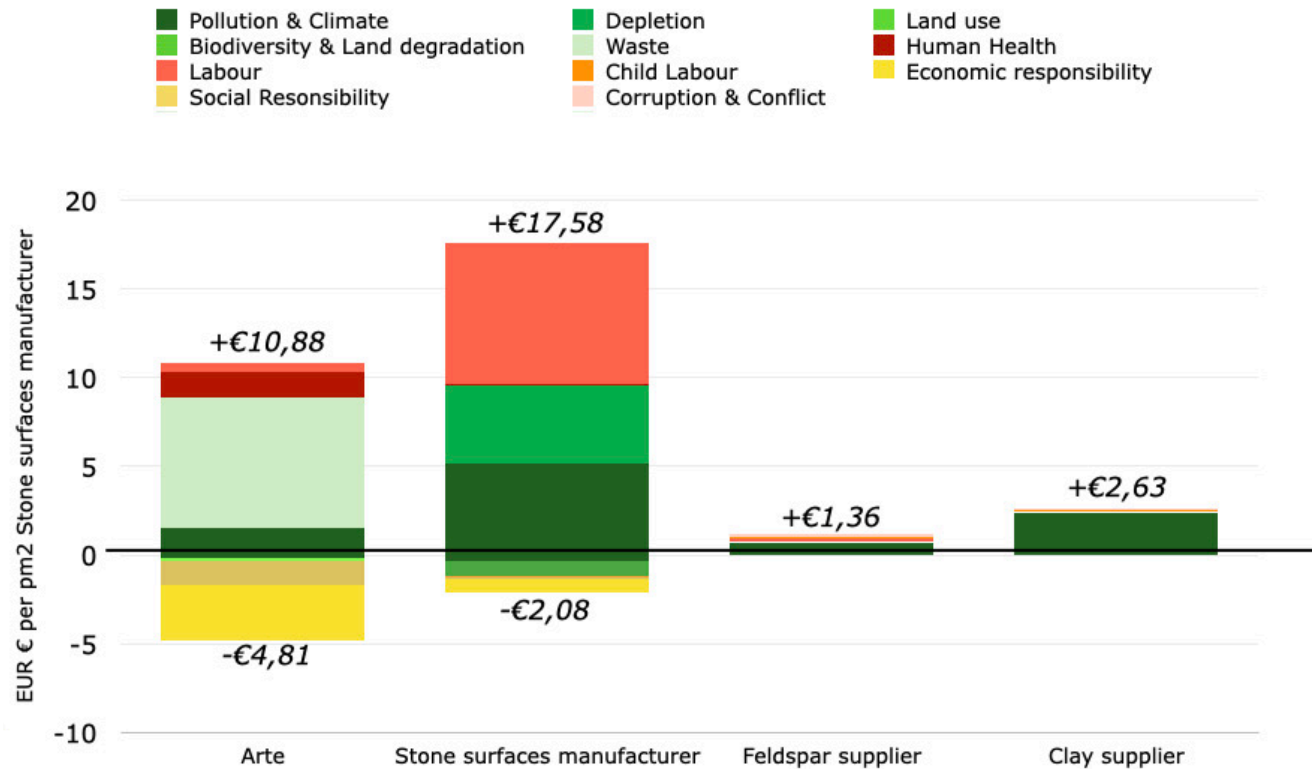


Figure 4.4: Breakdown of negative and positive costs per m² stone countertop



4. Case study 1: Arte Groep

ESCU's are calculated as the sum of the quantity of an issue (performance data), and the costs to prevent the issue (prevention costs). Both performance data and prevention costs can be company-specific or generic database-sourced (in other words: background data).

Performance data

Performance data is data measuring the sustainability performance of companies (e.g. kWh used). The data specificity of performance data of this analysis is displayed in Figure 4.5.

Arte was able to complete the assessment using mainly company-specific data. The stone surfaces manufacturer also actively took part in this pilot but was not able to demonstrate all the data, so partly, background data was used. Regarding the feldspar and clay supplier only background data was used.

Prevention costs

Prevention costs are data on the costs of sustainability mitigation measures (e.g. investing in solar panels). The data specificity of prevention costs of this analysis are displayed in Figure 4.6.

None of the value-chain partners were able to provide much foreground prevention costs, as it takes time to make investment proposals to mitigate impact. This should be a focus when the assessment is repeated.

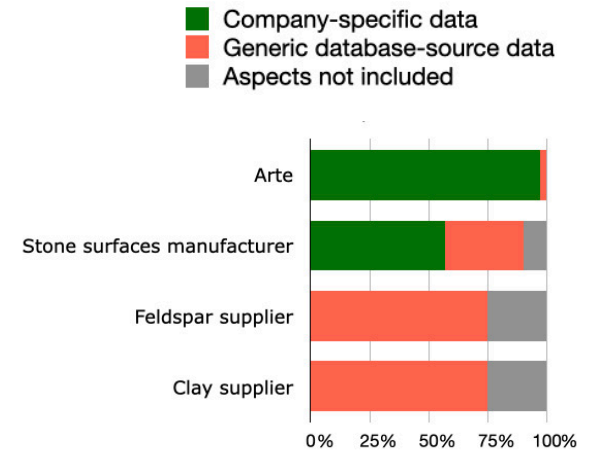


Figure 4.5: Data specificity of performance data

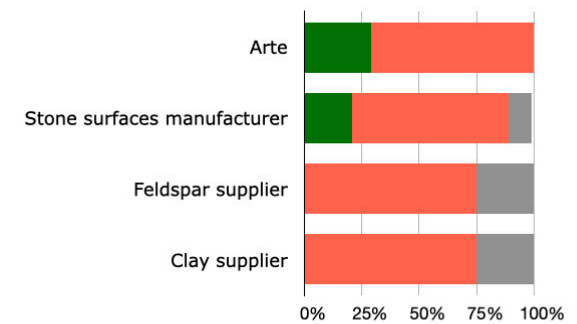


Figure 4.6: Data specificity of prevention costs



5. Case study 1: Arte Groep

Specific lessons learnt

- Within the category *Labour* the governance towards occupational health & safety is measured. This was previously measured through a general check list measuring the quality of governance on any topic. This proved too difficult for Arte to complete. As a response we made a governance check-list that was made specifically for occupational health & safety. Through this new check list Arte was able to measure their governance level towards occupational health & safety.
- The services of the retailer and installation technicians are excluded from this assessment. We are working on including these services in the tool as these are suppliers to the function of using a kitchen countertop. Further research is needed to determine this will be integrated in the Oiconomy assessment tool.

Arte: company's reflection

- *"The Oiconomy pricing tool is a good tool to open a dialogue with suppliers, and to see how to improve the collaboration to tackle sustainability."*
- *"Without our UU trainee conducting the Oiconomy Assessment for Arte, it would not have been possible as doing the assessment takes considerable time. However, if we were to continue with this, we would need some internal resources committed to this."*



5. Case study 2: ADMC Group

Company: ADMC Group

Location: Amsterdam, The Netherlands

Product: 1 heater for packs (pack heater). The pack heater is used for heating packs. The hot packs are used as thermotherapy for physical therapy treatments.

Timeframe: Data from 2020

Included impact categories: Pollution & Climate, Depletion of scarce materials, Land use, Biodiversity & land degradation, Waste, Labour, Economic responsibility, Bonus

Case description: ADMC started as an initiative of the Dutch Ministry of Economic Affairs. A consortium of entrepreneurs and healthcare organisations were invited to create a novel healthcare concept. ADMC produces medical equipment in the rehabilitation and physiotherapy field, with some focus on products for children with special needs.



5. Case study 2: ADMC Group

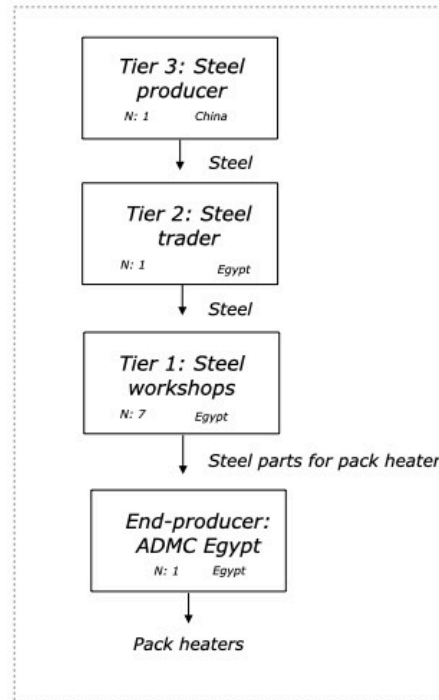


Figure 5.1: Scope of assessment: included value-chain partners and outputs

Scope of assessment

The supply-chain of the pack heater was traced back by including 80% of the purchased value. This identified the most relevant supply-chain: **the steel components** (outer-body of the pack heater, inner body, the net, the cover and the handle) (Figure 5.1).

The **steel components** are produced in China and bought by steel traders in Egypt. Steel traders are unregistered and informal middlemen that resell the steel to workshops. Within the steel workshops the steel is cut, welded, shaped and bended for the pack heater. ADMC Group buys the steel components and treats these parts with chemicals, applies coating and installs the electrical components.

5. Case study 2: ADMC Group

Breakdown hidden costs

The total hidden cost of a pack heater is **€ 130,12** (Figure 2). The sales price of a pack heater is **€ 1600**, meaning the hidden costs are adding **8,13%** onto the sales price.

The main negative hidden costs come from the category **Labour**. **Labour** measures fair wages, fair inequality and other labour conditions. The main costs come from the steel workshops as employees receive a remuneration that is far below the fair minimum wage as determined by the O.S. Employees in the workshops earn € 55-65 per month, while the fair minimum wage is € 129 per month. Increasing the price of the product so employees receive a fair minimum wage leads to negative costs of € 24,88. Besides fair remuneration, the employees do not receive sufficient contribution to health insurance nor is their occupational health & safety sufficiently managed (€ 3,69). Besides the steel workshops, steel traders were allocated default costs on Labour, as no company-specific data was gathered (€ 9,46). Gathering specific data on the steel trader, or cutting out this middle-men could eliminate these costs.

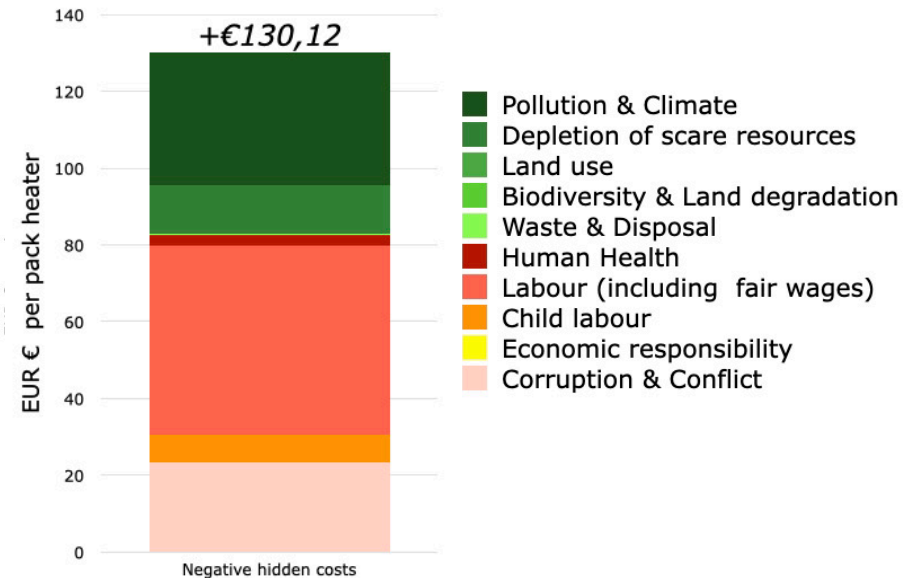


Figure 5.2: Break of negative hidden costs for 1 pack heater

The second biggest impact category is **Pollution & Climate**. The electricity consumed by the steel workshops (€ 12,12), ADMC (€ 9,00), and CO₂ emissions during steel production (€ 11,42), contribute mostly to this. The negative costs on **Depletion of scarce resources** are background costs for the primary production of steel in China (€ 11,42).

5. Case study 2: ADMC Group

In the steel workshops child labour was found to occur. Raising the wages of children to a fair minimum wage of an adult results in negative costs of € 6,88. ADMC is aiming to tackle the root causes of child labour by, among other activities, providing alternative livelihoods.

Other hidden costs that were found include costs to prevent **Corruption & Conflict**. According to the Corruption Perception Index, Egypt is sensitive to corruption. ADMC has governance mechanisms in place to prevent corruption within their organisation. The steel workshops and steel traders do not have any governance mechanisms in place to prevent corruption, which results in negative costs of € 23,46.

This assessment demonstrated the absence of negative impacts on various aspects. This assessment showed that ADMC pays the steel workshops a sufficient amount for the steel components of the pack heater.

Besides negative hidden costs, positive costs were calculated (Figure 5.3). Bonus ESCU's are based on actual company spending, benefitting others than the ones involved in the transaction. Positive costs of **€ 17,56** were found, all of this was spent by ADMC. ADMC invested to train their employees, reimburse medical expenses and contribute to a project to prevent child labour, by among other things providing microcredits and by organizing capacity raising activities.

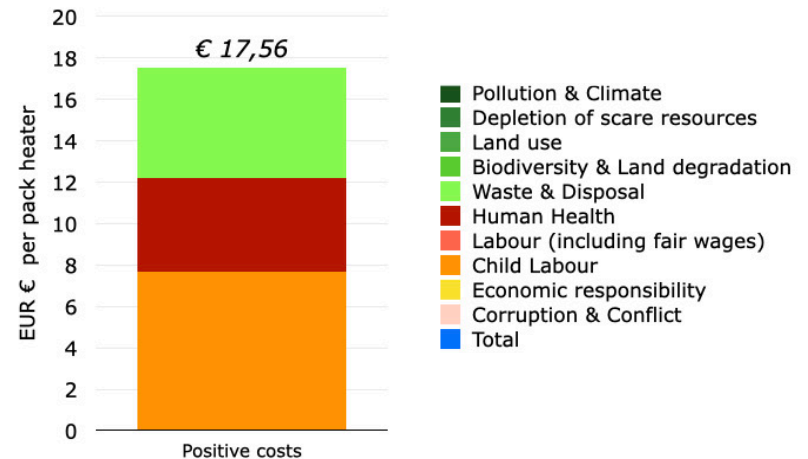


Figure 5.3: Positive costs per pack heater





5. Case study 2: ADMC Group

Figure 5.4 shows a breakdown of the negative hidden costs (above 0) and positive costs (below 0) per supply chain partner.



Figure 5.4: Breakdown of negative and positive costs per supply chain partner





5. Case study 2: ADMC Group

ESCU's are calculated as the sum of the quantity of an issue (performance data), and the costs to prevent the issue (prevention costs). Both performance data and prevention costs can be company-specific or generic database-sourced (in other words: background data).

Performance data

Performance data is data measuring the sustainability performance of products (e.g. kWh used). The data specificity of performance data of this assessment is displayed in Figure 5.5.

ADMC Group was able to complete the assessment using mainly company-specific data. Data on the steel workshops was retrieved through a questionnaire, conducted by a local NGO. Regarding the steel trader and steel producer data was mostly obtained using generic databases.

Prevention costs

Prevention costs are data on the costs of sustainability mitigation measures (e.g. investing in solar panels). The data specificity of prevention costs of this analysis are displayed in Figure 5.6.

None of the value-chain partners were able to provide much company-specific prevention costs, as it takes time to make investment proposals to mitigate impact. This should be a focus when the assessment is repeated.

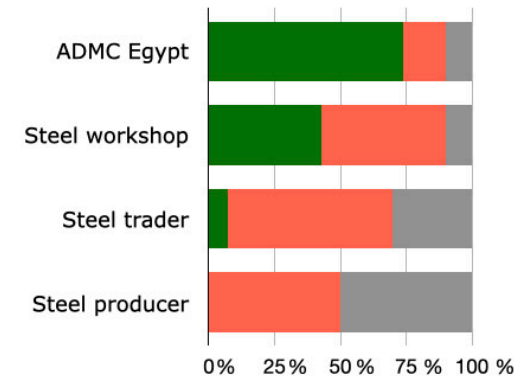
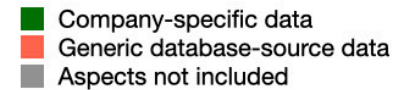


Figure 5.5: Data specificity of performance data

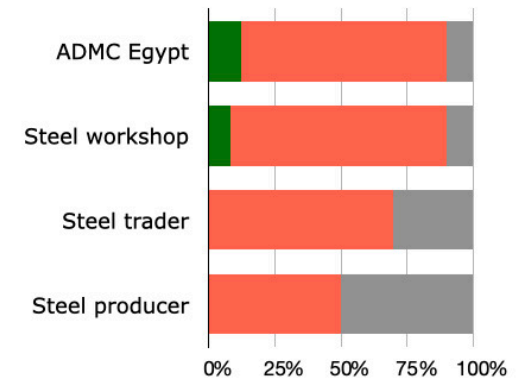


Figure 5.6: Data specificity of prevention costs





5. Case study 2: ADMC

Specific lessons learnt

- The governance level towards corruption was measured within ADMC as they operate in a country with a high corruption index. This was measured using a check-list that included a list of measures companies should take to mitigate corruption. Some measures proved to be overly extensive for a SME operating in Egypt to commit to. Through feedback by ADMC we have been redefining the governance criteria towards corruption for SME's. Further refinement of this list is necessary.
- In order to gather foreground data on the steel workshops, a questionnaire was made. This questionnaire included questions on environmental performance and social performance. This questionnaire could be improved to ask better questions around intricate topics such as child labour and corruption.

ADMC: company's reflection

- *"Oiconomy was a great tool to look into our hidden costs and analyse our CSR measures in the company and in our first-tier suppliers. Through using the tool, we could look into practical steps whereby we can share knowledge and help our suppliers to comply with international trade standards, through knowledge transfer".*
- *"We appreciate duplicating the tool through many other companies, so that they can by their role make use of the results from the Oiconomy".*





6. Case study 3: Verstegen

Company: Verstegen Spices & Sauces B.V.

Location: Rotterdam, the Netherlands

Product: 1 jar of ground white pepper

Timeframe: Data from 2020

Included impact categories: Pollution & Climate, Depletion of scarce materials, Land use, Biodiversity & land degradation, Waste, Labour, Economic responsibility, Use-pollution, Use-health, Use-Social, End-of-life, Bonus

Case description: Verstegen is a spices & herbs manufacturer from the Netherlands. Verstegen sells white pepper sourced from Indonesia, where the pepper is cultivated by smallholders and sold to the pepper exporter. Verstegen has been initiating various projects to improve the sustainability of the pepper supply chain but has not yet quantified the externalities associated with white pepper.





6. Case study 3: Verstegen

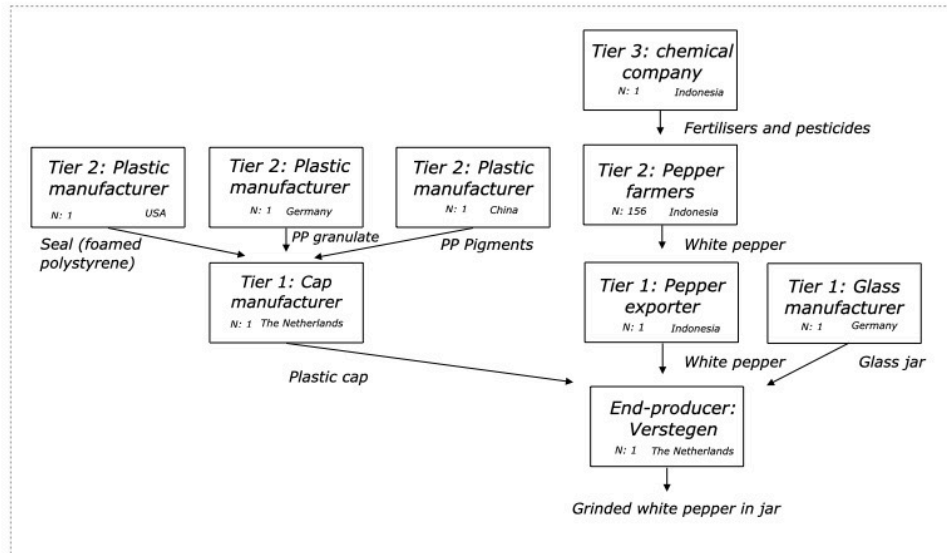


Figure 6.1: Scope of assessment: included value-chain partners and outputs

Scope of assessment

The supply-chain of white pepper in a jar was traced back by including 80% of the purchased value. This identified the most relevant supply-chains: **the plastic cap, the white pepper and the glass jar** (Figure 6.1).

The **plastic cap** is manufactured in the Netherlands, and is supplied with the seal, PP granulate and PP pigments. The **white pepper** comes from Indonesia where it is handled by an exporter and cultivated by pepper farmers. Pepper farmers use chemical fertilizers and pesticides. These chemicals are included in the scope as they are a high impact material. The **glass jar** comes from a glass manufacturer in Germany.





6. Case study 3: Verstegen

Breakdown hidden costs

The total hidden costs of 1 jar of grinded white pepper are € 1,03 (Figure 2). The sales price of a jar is € 2,99, meaning the hidden costs are adding 34% onto the sales price.

The main negative hidden costs come from the category *Labour*. Labour measures fair wages, fair inequality and other labour conditions. The glass manufacturer has a salary inequality ratio of 98,7 between the lowest and highest paid salaries within the company. This is above the fair inequality ratio of 23,8. This leads to costs of € 0,76. Additionally, the pepper farmers do not offer their employees health insurance or ensure occupational health & safety (€0,04).

The second and third biggest cost categories are *Pollution & Climate* and *Corruption & Conflict*. Most costs to mitigate pollution are caused by the pepper farmers using fertilizers (€ 0,01) and through the production of glass (€ 0,19). Pepper farmers and pepper exporters are most susceptible to *Corruption* and have no active governance to mitigate that (€0,04).

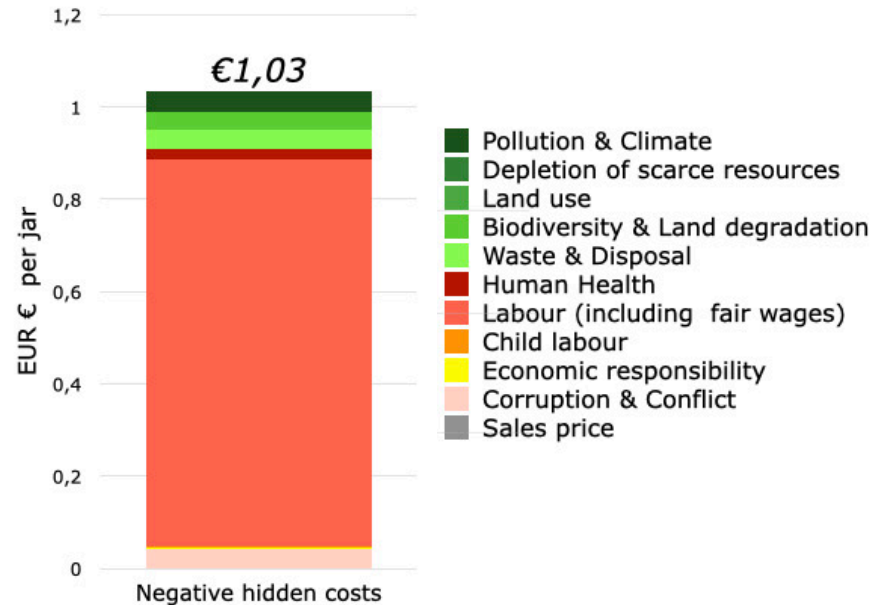


Figure 6. 2: Break of negative hidden costs per 1 jar of white pepper

Other negative hidden costs were found for *Economic Responsibility* and *Waste*. The glass manufactures pays insufficient taxes, which leads to € 0,0025. Concerning waste, Verstegen gets allocated € 0,04 for the end-of-life disposal.



6. Case study 3: Verstegen

Other hidden costs that were found, include costs to prevent *biodiversity* loss. Verstegen, together with the pepper exporter, invested in Agroforestry solutions to increase biodiversity. Through this project, supply-chain specific mitigation costs were used to calculate prevention costs.

Costs were allocated to prevent *Child Labour* among pepper farmers, as the absence of it could not be demonstrated. This was calculated as the costs to replace child workers with adult workers, earning a fair minimum wage. This resulted in costs of € 0,004 per jar of pepper.

This assessment demonstrated the absence of negative impacts on various aspects. It showed that all suppliers get paid fairly for their products and that the depletion of scarce materials is very low. Additionally, there is no impact on the category *Land use*, as the yields are higher than elsewhere in Indonesia.



Besides negative hidden costs, positive costs were calculated (Figure 6.3). Positive costs are based on actual company spending, benefitting others than the ones involved in the transaction. Positive costs of € 0,89 were found, 98% of this was spent by Verstegen. Verstegen invested to increase yields, contributing to food security (expressed in the category *Land use*). The project also led to increased livelihoods of pepper farmers (*Economic Responsibility*).

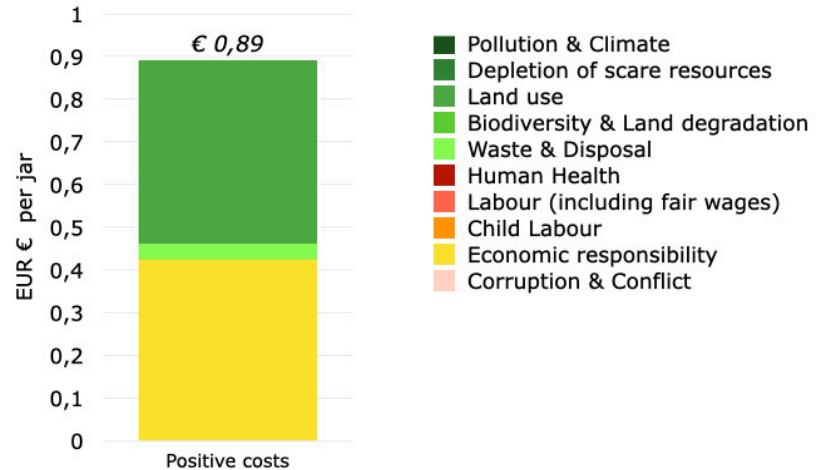


Figure 6.3: Positive costs per 1 jar of white pepper



6. Case study 3: Verstegen

Figure 6.4 shows a breakdown of the negative hidden costs (above 0) and positive costs (below 0) per supply chain partner.

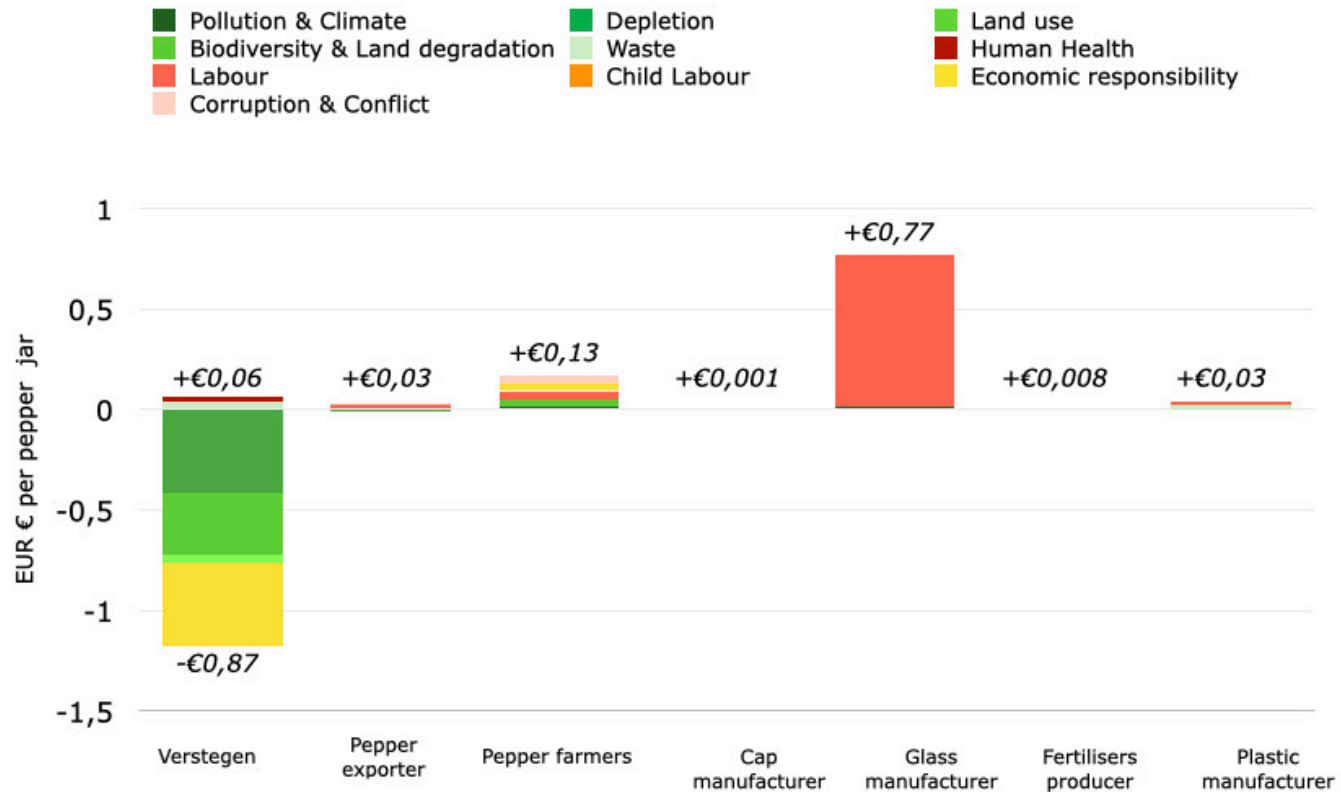


Figure 6.4: Breakdown of negative and positive costs per supply chain partner





6. Case study 3: Verstegen

ESCU's are calculated as the sum of the quantity of an issue (performance data), and the costs to prevent the issue (prevention costs). Both performance data and prevention costs can be company-specific or generic database-sourced (in other words: background data).

Performance data

Performance data are measuring the sustainability performance of companies (e.g. kWh used). The data specificity of performance data of this analysis is displayed in Figure 6.5.

Verstegen, the pepper exporter, the pepper farmers and the cap manufacturer were able to complete the assessment using mainly company-specific data. The data of the glass manufacturer was mainly obtained through generic databases.

Prevention costs

Prevention costs are data on the costs of sustainability mitigation measures (e.g. investing in solar panels). The data specificity of prevention data are displayed in Figure 6.6.

None of the value-chain partners were able to provide much company-specific prevention costs, as it takes time to make investment proposals to mitigate impact. This should be a focus when the assessment is repeated.



Figure 6.5: Data specificity of performance data

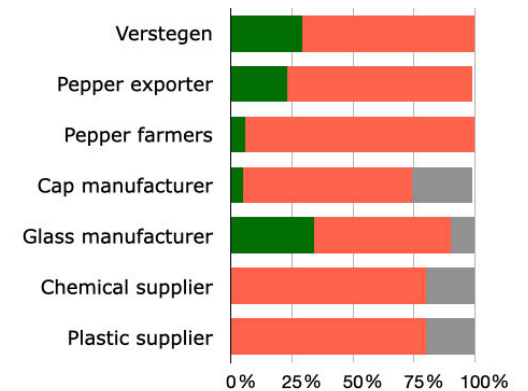


Figure 6.6: Data specificity of prevention costs





6. Case study 3: Verstegen

Specific lessons learnt

- The pepper jar is sold by retailers to the consumer. In this assessment the retailer was excluded. In future assessments the retailer should be included as they offer a vital service: selling the product. Further research is needed to determine how this can be integrated in the Oiconomy assessment tool.
- Pepper farmers operate in Indonesia: a country with a high corruption index. In the Oiconomy Standard companies operating in such countries need to have proper governance in place to mitigate corruption within their company. However, pepper farmers are low developed suppliers, that we cannot expect to have sophisticated governance systems in place. For that reason, pepper farmers are excluded from receiving ESCU's on *Corruption & Conflict*.

Verstegen: company's reflection

- *"We liked the process. The collaboration and transparency has given us a better perspective of the complexity. The Oiconomy Tool has definitely helped us. The weight and the impact of the topics is still hard to determine, however by working with the tool more often this will become more clear".*
- *"Within Verstegen the results get shared with the management and will be presented during a seminar on the end of the month. We will also share it on social media and on the website. The responsible teams will determine interventions based on the results. On the short term we can use the tool for our project in India, Indonesia and Costa Rica".*





7. Child labour

Child labour calculation method

Child labour is only measured if there is a risk on child labour, according to the UNICEF child labour statistics. If there is a risk and absence of child labour cannot be demonstrated, the Oiconomy method assumes child labour is present. The ESCU's are calculated as follows:

1. The company has demonstrated absence of child labour, including external labour, e.g. through certifications.
-> No ESCU's are allocated
2. If there is no demonstrated absence of child labour or the supplier is unknown, or the company disagrees with unannounced audits:
 - a) The most likely children's' hourly wage is known or determined using wageindicator.org by taking 30% of the lowest wage for an adult.
 - b) Work hours per product unit are estimated using input-output databases and all work hours are assumed child labour.
 - c) *-> The maximum ESCU's are calculated: (Fair minimum wage for adult – children's' wage) x (1 - Human development index (HDI)) * hours worked on product*

Thereafter the maximum is reduced depending on the HDI of a country. The HDI works as a reducing factor for countries that are more developed and likely to experience less child labour. This makes the ESCU's for child labour on the same product produced in Turkey (HDI: 0,82) lower than for Yemen (HDI: 0,47).

Child Labour in company cases

- Cases of child labour have been identified in the supply-chains of Arte, Verstegen and ADMC at some of the root suppliers.
- Despite of the expensive mitigation measures, the ESCU's for child labour are relatively low with 0,4%, 0,4% and 5,5% of the hidden costs for Arte, Verstegen and ADMC respectively.
- ADMC has identified child labour as an issue and is actively trying to mitigate it through a child labour project.



8. Fair minimum wage

Fair minimum wage

- The Oiconomy Pricing method calculates the “Fair Minimum Wage” based on a relative system for medium and high income countries, bottom truncated by an absolute minimum wage for the lowest income countries.
- How it was calculated: for the relative system”, the average percentage of the GNI/capita in the 20% top performing countries is taken. The absolute minimum wage is based on the World Bank medium poverty line and a set of ILO conventions and accounting for lifetime workhours, lifetime living and a family of 2 adults and 2 children.
- The Oiconomy Pricing method’s primary goal is to assess sustainability, where the living wage is more based on avoiding extreme poverty.
- Therefore, the Oiconomy Pricing method only covers for 2 children, but on the other side accounts for the fact that an average person has to gain an income for a full life time in a much shorter work period.
- In this pilot project we found in the case of ADMC that employees in the steel workshops earned 53% below the fair minimum wage.
- Living wage calculations are available in various approaches. One crucial core question is whether a salary should cover a limited family size or also large families. The Oiconomy Price approach uses a 2 adults plus 2 children family size.

9. Company's experiences

Before the start of the pilot, the participating companies were informed about the nature of the method and the intentions of the pilot. Support by the Oiconomy team was given in applying the calculation tool.

With this support they were able to finalize the assessment. The pilot project took 4 instead of the expected 3 months. The time invested per company, including the support by the Oiconomy team was around 5 weeks (200 hours), of which approximate 60 hours was the time spent by the company itself, but not including time spent by suppliers. One should note that future repetitions with experience would require far less time.

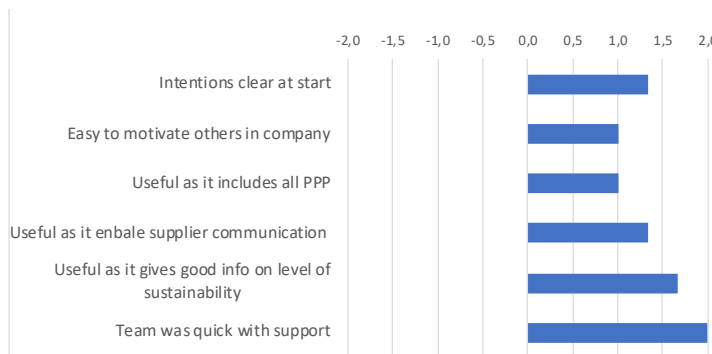


Figure 9.1 Pilot study experiences: starting & motivation to use tool (-2 = very negative / 2 = very positive)(average score of 3 companies)

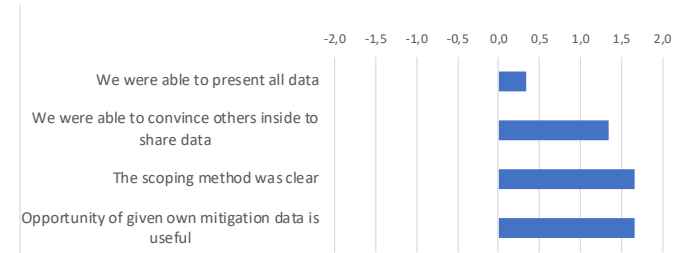


Figure 9.2 Pilot study experiences: working with the tool (-2 = very negative / 2 = very positive)(average score of 3 companies)

The companies appreciated the inclusive nature and the use of the tool in the interactions with their main suppliers (Figure 9.1 and 9.2).

Being a pilot project it was clear that explanation and instruction materials are still in development. However, with the support provided the key principles of the approach were seen as useful and the companies are considering further uptake of this approach (see section 4, 5 and 6).



10. Oiconomy Team's experiences

In this pilot project, running from November 2021 to March 2022, three pilot companies applied the Oiconomy tool, with one part-time researcher at UU available for explanations and support. Here we share our main observations as UU-team. First we briefly describe experiences and (*in italics*) our follow up action.

1. We have seen **all three pilot companies** taking up the analysis for their own companies and initiating collaboration with the **main suppliers**, after the initial Life Cycle Inventory (Suppliers Tab). With the background support from the UU team all three companies were able to **complete the full scope assessment**.
2. The pilot assessment tool (as an excel-file) required some **corrections** to enable full results.
3. The pilot companies were in **good contact with their main suppliers** and were able to convince and motivate the most relevant suppliers to join the pilot. Large suppliers of small elements of the product were hard to convince. In these cases background-data-based assessments were made. *In the future users will need to be supported in filling such gaps.*

4. At places in the tool where a governance

performance assessment is used, this raised some concerns. Especially for smaller suppliers this assessment is **too complicated**. *An easy version for SMEs is in development.*

4. It may be tempting to calculate net positive value by distracting the negative costs from the positives but this is not the intention of the system. The negative hidden costs are derived from prevention of hidden impacts and the positive costs are extra benefits for people and planet. **Negative costs cannot compensate the positive costs**. In our discussions we see the temptation to do this. *We have to more explicitly communicate the difference.*
5. Current positives were sometimes calculated as the **positives** of the **entire organization** divided by the % of revenue of the product under review, while they were location specific. However, we aim to only measure the positives linked to specific value chains. *We will adjust the standard by distinguishing rules for value-chain specific positives and organisation-wide positives to the related products.*



10. Oiconomy Team's experiences

6. The current excel version of the pilot assessment tool is not attuned to the required **users inside a company**. A distinction needs to be made between a coordinator (mostly like in a sustainability or environment, health and safety (EHS) department) and the colleagues supplying parts of the information needed. *The tool needs to specify data needs to the relevant classes of employees (finance, purchasing, EHS, product manager etc.).*
7. Full scope assessment is quite labour intensive the first time, mainly because the companies lack data or the knowledge who has the data even in their own company. Future assessments will therefore be much easier. *Based on the pilot experiences a guidance for starting to use of Oiconomy can be developed. Before starting an assessment, a **quick ex ante check** on applicability and product scoping can be done.*
8. Where more remote tiers of suppliers (3rd, 4th tier etc.) are involved, it is harder to achieve direct participation and collaboration. This is especially relevant when small or medium size enterprises are involved in middle- or low-

income countries. Maintaining the full PPP scope in these cases raises objections of two types: a- the total contribution to the total ESCU of the end-product will be marginal, and b- these remote suppliers may have many other clients, not being interested in such assessments. Despite this **dilution effect** in a specific value chain, the total of small contributions may still be relevant for prevention. Yet, the fact that the 1st tier suppliers could be involved, also raises the expectation that in the longer term, when the requirement to engage in the system reaches the 3rd, 4th tier etc. suppliers from several customers, these 3rd, 4th tier suppliers can also be engaged. *However, we plan to develop standard ESCU values for a short list of (100-200) inputs in the remote supplier tiers to solve this dilution issue. Most of the environmental default data on remote tier suppliers are already in the system. Science will have to add the socio-economic default data.*



10. Oiconomy Team's experiences

9. Partly overlapping with this issue is that in remote tiers of suppliers, tool users may need to collaborate with **small suppliers with low level capacities**, not used to business administrations or even illiterate. One can not expect such small suppliers to contribute to the assessment. *We will clarify the role of the supplier tier that is closest to such low developed suppliers, giving them the responsibility of applying the tool.*
10. The tool contained elements referring to **quality management**. These are considered to partly overlap with data collected in other aspects. *We will remove these quality management related elements.*
11. The small **community of practitioners** in the pilot served well as a form of mutual exchange of experience, fuelling commitment and motivation. *In the next phase of market introduction, it is wise to create such communities of practice again.*
12. For various aspects, the method includes a self-assessment of the **quality of corporate governance**, based on the worldwide applied form of management systems, applying the plan-do-check-act approach. The tool include questionnaires which have been experienced as too detailed especially in the case of small and medium size enterprises. *The rationale for using this needs to be better communicated to users, while a simplified version is needed for SME's.*
13. **Health risks** during the **user phase** are now addressed for all types of product. This may be less relevant for some categories of products. *We will check if existing categorisations product safety organisations (like at "Nederlandse Voedsel- en Warenautoriteit") may serve as source for excluding low-risk product categories.*
14. In the tool activities for **employee development** are included. This can result in very high ESCUs in richer countries', based on an average employee training costs in rich countries. *This may need to be adjusted to costs for lower-level employee training alone, to be more inline with SDGs.*



10. Oiconomy Team's experiences

15. The aspects of “**Labour conditions**” and “**Various social categories**” are assessed in the pilot version with lists of specific requirements. Pilot companies have difficulties answering these questions and for auditing these are still hard to check. *This part of the tool will be improved. The labour conditions problem is caused by too many different criteria, all packed together in a governance level assessment. That will be replaced by yes/no questions by aspect.*
16. The presentation of the overall results shows **very different distributions of hidden costs** between the sustainability aspects. This expressed the tailor-made approach showing the specifics of the supply chains analysed. Some relative high scores as well as very low scores surprised both the companies as well as the UU team. Correctness of the calculations were checked. *In some cases the underlying background data will be re-evaluated. We observe that an interpretation protocol for reading the end results is needed. Relative high prevention costs does by principle not equal relative high priority. Each sustainability aspect identified as have (some) hidden negative costs will need to be addressed. Low costs prevention options may still very well have high impact in reducing emission and unfair social conditions.*
17. The pilot project showed that full scope assessment is quite **labour intensive** especially the first time, mainly because the companies lack data or the knowledge who has the data even in their own company. **Support** by the UU team was **indispensable** at this stage. The companies grasped the functioning and the virtues of the Oiconomy Pricing approach at best after finalizing the analysis and seeing the results. We observe a shared expectation that future assessments will therefore be much easier. *Training opportunities and materials, online available explanations and justifications will be provided in the next stages.*



11. Opportunities for market introduction

For corporate users:

- Companies are challenged to use their own product-specific data and make their own specific impact mitigating investment calculations. This increases their own understanding of their own sustainability issues and by the transfer of the ESCU's also of their complete supplier network.
- Especially by making foreground ESCU calculations, companies also make the first step towards mitigation decisions and implementation.
- The approach enables forwarding of anonymized and aggregated information (as ESCUs per aspect) in the value chain
- The system provides default background data where no foreground data are available, but because these are usually worst case, companies are challenged to investigate their own product specific ESCU's.
- The system effectively shows the supply chain actors their mutual dependencies in sustainability, the need to cooperate and to select suppliers based on an integer- and comprehensive indicator on sustainability
- The transfer of aggregated anonymized sustainability data provides a means of transparency with little risk of revealing intellectual property.
- Using the tool connects well to business' suppliers management systems, and product development strategies.



12. Policy implications

- Transparency and due diligence is increasingly incorporated into corporate responsibility legislation. Non-financial disclosure is required for large groups of companies, especially in the international market. Full sustainability costs accounting tools can serve the implementation of this new legislation.
- Oiconomy Pricing is one of the tools enabling this. The special feature of this approach is that companies themselves are enabled to apply the approach, thus building sustainability expertise inside the company and in interaction with their main suppliers
- Policy support is required for enabling the market introduction of the Oiconomy approach, as well as the accreditation of the standard.
- Oiconomy Pricing can serve as a tool in sustainable public procurement policy, having suppliers substantiate their bids with the Oiconomy price.
- In contrast to many environmental assessment methods, Oiconomy Pricing addresses all SGD related sustainability aspects in a consistent and comprehensive methodology. It enables fully integrated assessment and prevents (unintended) trade-offs between sustainability aspects. It is recommended to support wider use of this in current policy projects (like Green Deals).



References & colophon

References

Croes, P. R. (2021). *Comprehensive in-supply chain life cycle assessment of the preventative cost-based externalities of products. An assessment methodology as first step to a sustainable and responsible true price economy: "Oiconomy"*. PhD thesis, Utrecht University, Utrecht

Croes, P. R. and Vermeulen, W. J. V. (2021) *'The Assessment of Positive Impacts in LCA in general and in Preventative Cost-based LCA in particular. A contribution to the Oiconomy Project'*, Int. J. Life Cycle Assess, 2021, 26(1), pp. 143–156

Croes, P. R. and Vermeulen, W. J. V. (2019) *"Quantification of corruption in preventative cost-based S-LCA: a contribution to the Oiconomy project,"* Int. J. Life Cycle Assess. 24(1), pp. 142–159.

Croes, P. R. and Vermeulen, W. J. V. (2016a) *'In search of income reference points for S-LCA using a country level sustainability benchmark (part 1): fair inequality. A contribution to the Oiconomy project'*, Int. J. Life Cycle Assess., 21(3), pp. 349–362.

Croes, P. R. and Vermeulen, W. J. V. (2016b) *'In search of Income Reference Points for S-LCA using a Country Level Sustainability Benchmark (part 2): Fair Minimum Wage. A Contribution to the Oiconomy project'*, Int. J. Life Cycle Assess., 21(3), pp. 363–377.

Croes, P. R. and Vermeulen, W. J. V. (2015) *'Life Cycle Assessment by Transfer of Preventative Costs in the Supply Chain of Products. A first draft of the Oiconomy system'*, J. Cleaner Prod., 102, pp. 178–187.

Abbreviations

ESCU	- Environmental Social Costs Unit
FBK	- Fonds Bestrijding Kinderarbeid
LCA	- Life Cycle Assessment
PP	- polypropylene
PPP	- Planet, People, Prosperity
RVO	- Rijksdienst voor Ondernemend Nederland
SDG	- Sustainable Development Goals (UN)
UU	- Utrecht University
UN	- United Nations

Colophon

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