



Corporate Social Responsibility Report 2022

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Letter from the CEO .

Already at an early age, energy production captured my interest; as I started to learn how energy can be produced, I became increasingly interested in solar energy. I saw its enormous potential as a scalable, modern and sustainable energy source. When my business partner Raphael Janssens and I founded the company 12 years ago, our ideals were the foundation to start pioneering to fulfil our mission. Although our company matured over the past years, following our ideals and creating impact through Photovoltaic (PV) solar energy is still at the core of everything we do at Ecorus.

What drives us is a tremendous passion for positively impacting the world we live in. We make an impact by helping our clients with their net-zero ambitions by offering a full range of development, construction, maintenance, financing and energy management services. We invest in good and pleasant working conditions for our employees and ensure that the materials we procure for the projects are sustainable and high-quality.

Our true belief in doing something good for society was also the reason for Ecorus to formalize what sustainability and corporate social responsibility mean to us. As such, we committed to the Ten Principles of the United Nations (UN) Global Compact in 2021. I am pleased to announce that the Ecorus Group reaffirm its support and commitment to the Ten Principles of the UN Global Compact in the areas of Human Rights, Labour, Environment and Anti-Corruption. In the coming year, we will continue to improve our impact in all areas.

Specifically, we plan to map and improve our direct and indirect CO2 impact.

In this first Corporate Social Responsibility report, we describe the actions we took to integrate the UN Global Compact principles into our business strategy and operations. We are delighted to share this information with all of our stakeholders.

Yours sincerely,



Philippe Vanhoef
Chief Executive Officer
of Ecorus Energy B.V.



Ecorus at a glance

When Ecorus was founded in 2010 in Belgium, the two founders, Raphael Janssens and Philippe Vanhoef, had a clear mission: create a positive impact on the world by developing and building solar projects. As the solar industry was still in its infancy, pioneering was the only way. In the years that followed, Ecorus grew from a pioneer to a team of solar energy specialists, setting the standards for safe, reliable, efficient and profitable PV solar installations.

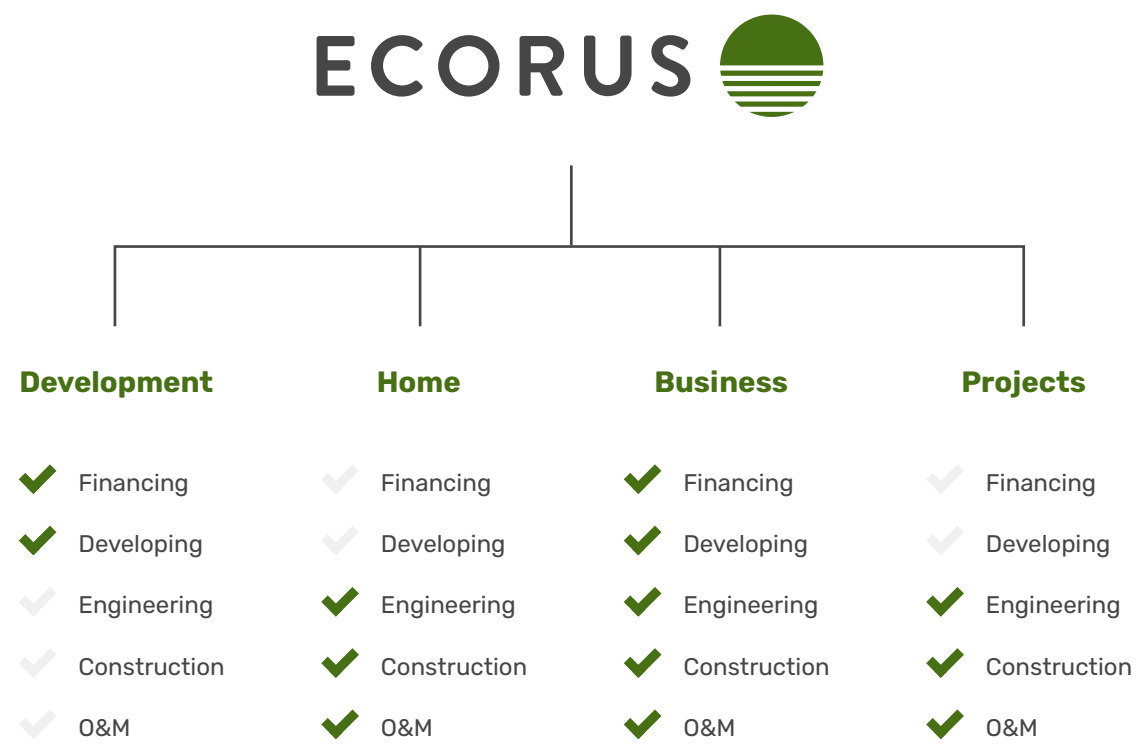
Our mission is to make an impact with solar energy by bringing this sustainable energy to everyone and promoting that energy is produced right where it is needed. We do not only get the PV installation constructed, but through careful and professional project management in the office and on-site, we make sure that the PV solar installation is built according to planning and budget and will perform as calculated. This ensures a high-quality PV system that provides the envisioned return on investment.



The Ecorus Group .

The Ecorus group is a vertically integrated company. It has been divided into different business units, focussing on financing, developing, engineering, building, operating and maintaining PV solar installations for business customers across Europe. Ecorus executes PV solar projects throughout Europe with a focus on the Netherlands and Belgium. Our main offices are located in Eindhoven and Amsterdam, the Netherlands.

The core of our operations is being executed by Ecorus Development, Ecorus Home, Ecorus Business and Ecorus Projects. In addition to the core business units, we have several overarching departments that provide support to all the business units, such as our Procurement Department. This department procures the best materials directly from the producers and ensures that they meet the highest quality standards.



Ecorus Development

This business unit develops solar projects, both rooftop-mounted (on industrial buildings and logistical centres) and ground-mounted installations (solar parks). We support our customers with the following: subsidy applications, innovative electricity grid connection applications, soil analysis, roof and roof-construction analysis, other required technical studies, guidance and support with insurance questions, sourcing of Engineering, Procurement, and Construction contractors (EPC), financing options and corporate PPAs and maintenance solutions.

Ecorus Home & Eleena

Ecorus Home is focused on the residential market, with social housing corporations as the main customers. Throughout the Netherlands, we support our customers with customized designs, project management, customer & inhabitant communication, procurement of materials, construction and long-term maintenance. As a solar specialist in the residential market, we can also provide innovative technical solutions, such as battery storage that works harmoniously with PV solar installations.

Our subsidiary Eleena provides the hardware, software and a cloud-based platform where the energy production of each installation can be followed by its user (the inhabitant) and the social housing corporation.

With this, we give our customers peace of mind.

Ecorus Business

Serving small- and medium-sized commercial buildings and carports with PV installations is what we do. Our main customers are Small & Medium-sized Enterprises (SMEs) and bigger corporates with multiple sites across Europe (e.g. supermarkets and hotels). We design, procure and build the installations. We can also support our customers with questions about project development or maintenance. Our goal is not only to build an excellent PV installation within a very short lead-time but also to have a smiling customer.

Ecorus Projects

Ecorus Projects is a leading EPC contractor in the European solar industry for large-scale PV solar projects for corporate developers and clients, including Ecorus' privately owned fund, National Solar Energy Fund (Nationaal Zonne-energie Fonds; NZeF). We can deliver turn-key PV solar projects from rooftop projects to ground-mounted solar parks. Our solar experts design, calculate and simulate the most optimal PV installations. They are not shy to tackle technical challenges, such as grid congestion or building construction limitations, leading to a successful and profitable PV solar installation.

For the maintenance of solar installations, we have partnered with Solora, providing 24/7 monitoring and preventive and corrective maintenance. If support on financing is required for the project, we can support our customers through our investment department Ecorus Invest and our partner NZeF.



Highlights 2022

This year Ecorus has developed and built many PV installations, both big and small. Here below are some examples from our project managers of how this year's projects make an impact on the environment and local communities.

Project Fledderbosch

Frans Latjes
Project Manager at Ecorus Development



Could you introduce the project?

In 2017 we started with the development of a big solar park of 100 hectares in the province of Groningen, the Netherlands. The customer is the local energy cooperation 'Energiecoöperatie Ten Boer'. The project is initiated by a joint effort of an agricultural land owner, the local water board Waterschap Noorderzijlvest and the local energy cooperation 'Energiecoöperatie Ten Boer'. The development of a solar park is a long process where local permissions are the most important. These involve several steps, such as the participation of the local community, designing a solar park in accordance with the environmental and social requirements of the permissions, applying and obtaining an SDE subsidy and arranging an electricity grid connection. We have contracted our sister-company Ecorus Projects to perform the EPC for this project. Solar Park Fledderbosch is now in the detail-design process and will be built in 2023.

Why does this project make you proud?

First of all, it is the sheer scale of the project; with more than 100 MW, it will provide 26,000 households with clean energy. This prevents a lot of CO2 emissions in the generation of electricity for the inhabitants of the province of Groningen. For Ecorus and the province, it is important to have the local community participate and incorporate the solar park into the existing landscape and nature. Therefore, we have applied the tailored method ('maatwerkmethode').

We have made a plan with the local community, the local energy cooperation, the municipality, the regional water authority, the province

Groningen and biodiversity experts, amongst others. It was not easy to get all these parties on the same page, but we did it.

What specific sustainability and human rights measures did you take for this project?

We ensured that one-third of the 100 hectares of the project is a nature area; throughout the terrain, we will use a special grass mix that stimulates insect life and biodiversity. We will also install bee and insect hotels. Furthermore, we will plant an area of 300m by 100m with reeds so that many of the native farmland and meadow bird species will feel at home. These are just some examples of how we want to promote biodiversity in this project.

In addition, we will make a scenic viewing point and place benches and a bird observation cabin. We work with the local energy cooperation and ensure together that some of the revenue will flow back into the local community. There will be ways for the local community to participate and benefit from the solar park. The majority of the development work has been finished, and the main EPC contractor has started its activities. Although that company is certified in safety and has a large focus on CSR, we will follow up closely with them to ensure a project that benefits the people, nature and world as a whole.

Project Wienerberger Kijfwaard

Alexandra Wijkema
Project Manager at Ecorus Development



Could you introduce the project?

Project Wienerberger Kijfwaard is situated at a factory complex in Pannerden, the Netherlands. The two factories (consisting of multiple buildings) produce in total almost 424,000 pavement bricks daily. We realized two PV solar installations with a size of 3.1 MWp (5598 solar panels) which will produce the energy equivalent of about 1060 households. Ecorus was in charge of the project management, engineering and construction, as well as supporting with the financing of the project (in cooperation with NZeF).

“ *The solar installations enable Wienerberger to reduce its fossil fuel usage and produce its products more sustainably.* ”

What makes it sustainable?

The pavement bricks are already considered a sustainable product because the mining of the raw material (clay), production and usage all take place in the Netherlands. In addition, the bricks have a long lifetime and are fully recyclable. However, the brick production process requires a high temperature and, therefore, a lot of energy. The solar installations enable Wienerberger to reduce its fossil fuel usage and produce its products more sustainably.

Was it challenging?

Although I like collaborating with our customer Wienerberger, there were different departments of Wienerberger involved; the four major are HSE staffing, Technical staffing, Automation staffing and last but not least Production Operations itself. Each of them wanted their own requirements to be fulfilled, which made it really challenging. On the other hand it shows their professionalism in having the experts in house. Apart from technical and operational requirements, the HSE requirements played a crucial role in the project due to the complex layout of the buildings. Furthermore, they were renovating their roofs, complicating the dependency on our project planning. One of my main tasks was managing these different stakeholders and their requirements, aligning them and ensuring the correct information and decision flow. We got the job done successfully and have a happy customer. That makes me immensely proud, and I look forward to working on the next Wienerberger projects.

Social Housing Corporations

Nico Heemskerk

Project Manager at Ecorus Home



Could you introduce the work?

Our main customers are social housing corporations who own large amounts of residential buildings (houses and flats) and rent them out to inhabitants with a low income. The rent is usually significantly lower than in the private sector. We, Ecorus Home, install small-scale PV solar systems on the roofs of their buildings. These systems usually consist of about four to eight solar panels, an inverter and the required cabling to connect it to the electrical cabinet in the building. We also install an additional electricity meter so that the customer and inhabitant can see the energy production of the PV system on the online portal. This also allows us to monitor and ensure the functionality of the PV system. This year at Ecorus Home, we have upgraded thousands of residential buildings with a PV system.

“ Even though the shortage of material is a global problem, through long-standing partnerships with our suppliers we ensure a high availability of materials.

Why does this work make you proud?

Apart from accelerating the transition to more renewable energy, what really makes me proud is to help the people who need it the most. The inhabitants of social housing buildings usually have a low income. With the big increase this year in gas and electricity prices, these inha-

bitants are struggling to pay their (electricity) bills. Installing a PV system helps them a great deal. Right from the moment the PV system is installed, they use less energy from the electricity grid, thereby directly lowering their energy bill and helping them stay out of debt.

What is challenging in your projects, and how do you deal with that?

The demand for our PV systems, especially with the current electricity prices, is so incredibly large that it is hard to execute the projects with the speed and amount of buildings that our customers request. The main problem is the availability of material and qualitative manpower to install the PV systems. Even though the shortage of materials is a global problem, through long-standing partnerships with our suppliers, we ensure a high availability of materials. Furthermore, we work with local subcontractors who install the PV systems for us. We require them to work according to high-quality and -safety standards. However, the number of workers who can deliver that is rather small. That is why we plan to set up training and schooling programs with our subcontractors. With this, we can increase the amount of qualified and skilled laborers in the market. This will then allow us to increase the speed and number of buildings we can provide with PV systems.

Project ALDI

Maarten Verhaart
Business Manager at Ecorus Business



Could you introduce the project?

The discounter supermarket chain Aldi in the Netherlands got to know Ecorus Business through an as-fast-as-lightning project in 2020 (engineering and building PV installations for four supermarkets in just three weeks) and another successful project with nine supermarkets in 2021. After this, Aldi contacted Ecorus again in 2022 to upgrade the remaining of their supermarkets throughout the Netherlands with PV installations with a possible roll-out to supermarkets in other countries. Supplying multi-site customers throughout the Netherlands with PV installations is what we are good at.

"We make double use of the space that the supermarket occupies and scarce land does not need to be sacrificed."

What makes this project interesting if we look at Corporate Social Responsibility?

The most important aspect of this project is a more sustainable use of space and consumption. Through building a PV system on the roof of the supermarket, we make double use of the space that the supermarket occupies, and scarce land does not need to be sacrificed. Green energy is produced where it is directly used by the supermarket. With the recent rise in electricity and gas prices, energy costs are lowered by building PV systems at these supermarkets.

This will allow them to sell their products at competitive prices for customers who do not necessarily have a high income. This will help to prevent poverty.

What sustainability and human rights aspects did you incorporate into the project?

During the construction, we specifically focus on working with local subcontractors as much as possible (such as an AC-electrical installer, a roof installer and Dutch subcontractors in general). We strive for long-term partnerships not only with our customers but also with our subcontractors and suppliers. This allows for more people to enjoy a stable job and income. Furthermore, we use high-quality products with a long lifetime, we separate waste and all our company lease cars are fully electric. At Ecorus Business, we employ not only Dutch-born people but also immigrants. We give them a chance to further learn and develop themselves while working on sustainable energy projects.

Project Bathmense Landen

Philip Berendsen & Elena Sanchez Varela
Project Manager & Project Engineer at Ecorus Projects



Could you introduce the project?

This is a large-scale PV energy project next to the train tracks near Bathmen in the province of Overijssel, the Netherlands. It was the wish of the local agricultural landowner Erik Brilman and the local energy cooperation Noaber to develop and build a solar park to give the village Bathmen access to locally produced, clean and sustainable energy. They partnered with Klimaatfonds, which asked Ecorus Projects to engineer and build this solar park. The solar park spans about 15 hectares and contains 33,000 PV modules (solar panels), combining to a total power of 18 MW.

Building a solar park on an agricultural plot of land, how can that match with sustainable use of land?

This plot of land has been used intensively for many years to grow different kinds of crops. It will be good for the soil to be left alone for the next 16 years to recover its nutrients. During that time, there will be noise- and emission-free, sustainable energy production. Throughout the terrain, ponds that will stimulate all kinds of amphibious insects and animals are incorporated. This will also attract many birds. Around the solar park, special wildlife fences are installed so that their natural movements are not restricted, and they can move freely. Finally, bushes have been planted, and a special mix of grasses has been sown over the whole solar park (in between and under the solar panels) which will

be maintained naturally by grazing sheep. This will create a healthy system for the animals (and humans) living around and on this solar farm and for the soil to restore its required nutrients.

What did you do in your work to make it a sustainable project?

Managing such a big project is quite challenging. There are sustainable requirements and many others to incorporate, all under high time pressure. We have engineered the solar park Bathmense Landen in only 2 months and built it in a record time of only 12 weeks. Nonetheless, we have searched for methods that could make the project more efficient and sustainable in execution. During the engineering, we tried to optimize as much as possible so we would have less waste of materials during construction. In the construction phase, we already separate waste and use local subcontractors where possible on all of our projects. What was special about this project is that we used tailored site offices with enlarged batteries, inverters, solar panels and a generator. As soon as we had enough materials, we built a small PV system on site that we connected to the site offices. For the biggest part of the project, we ran our site offices and some of our equipment on solar energy. Sometimes, we could even charge an electric car with the remaining solar energy. This saved a lot of CO2 emissions during the construction of the project.

Sustainability Award 2022

Ecorus wins the award for 'Best XXL Utility Solar Project Netherlands 2022' during the first edition of the Dutch Sustainability award gala.

According to the jury, our project 'Groetpolder' (photo page 7) has won the award for this category based on the following criteria:

- Best use of grid connection: based on 'cable pooling' with a nearby wind farm which makes this renewable energy factory efficient and reliable in most weather conditions. In addition, we can scale down solar production if there is too much wind and solar at the same time.
- Best use of non-arable land: the park of 45,000 solar panels stretches across a long area of 4km. The reason for this shape is the location of the park next to a dike, and this stretch of land was not used for farming or other building purposes. We also had to use special cables without fish oil to avoid attracting rodents.
- Hidden solar park: although this solar park is beautiful to behold, we can imagine that some local residents can be distracted by this solar park. Therefore, the park is hidden and out of plain sight.



A close-up photograph of a person's hands planting a small green seedling into the soil. The seedling has a purple stem and several green leaves. The background is blurred, showing more of the same plants and the person's arm.

Corporate Social Responsibility at Ecorus

Honest solar energy for everyone .

When the company was founded in 2010, the goal was to positively impact society through solar energy. Therefore, corporate social responsibility has always been at the heart of Ecorus. Throughout the company's growth in the last 12 years, the focus has been on how to grow sustainably and ensure the positive impact. In 2020 this was formalized in the manifesto 'Honest solar energy for everyone' (Eerlijke zonnestroom voor iedereen). The following 5 points are central to the manifesto:



We strive for maximal biodiversity



We involve all stakeholders in the process and design



We adjust our projects to fit the surroundings with minimal impact



We strive for active participation by the local community



We value aesthetics all throughout the process

The board of directors at Ecorus did not only want to adhere to this manifesto but take further steps in committing to and acting on CSR principles. It was, therefore, no surprise that Ecorus was the first Dutch solar EPC company to join the UN Global Compact at the end of 2021. All our construction Business Units maintain and apply QHSE policies, and in the past year group-wide CSR and QHSE policies have been added to the Ecorus governance and strategy.

CSR and human rights in the company and throughout the supply chain

The foundations for the CSR policy are international treaties such as the Universal Declaration of Human Rights, the ICCPR and ICESCR. Ecorus' values and norms are expressed in this CSR policy, such as:

- We value diversity in our company and with our stakeholders and do not tolerate discrimination.
- We do not accept any form of child labour, forced labour, slavery or inhumane treatment.
- Health and safety of humans and the environment are paramount in realizing our solar installations.
- Every employee has the right to freedom of movement, privacy, collective bargaining and a salary above minimum wage. In addition, we strictly follow the national laws on working hours as well as the fundamental conventions of the International Labour Organization (ILO).

- Core values in our organization are trust, honesty and transparency, and we do not accept corruption.

The CSR policy now forms the basis for the operations at Ecorus and for conducting business with Ecorus.

Regarding diversity and discrimination, we have 12 nationalities and even more ethnicities among our employees and promote cultural exchange. Of our employees, 24% are female (slightly higher than the industry standard [1]), and one of our three executive board members is female. We furthermore prefer to employ women for our current open positions.

To ensure clarity in our supply chain, we have established a supplier code of conduct based on our CSR policy and implemented it with several suppliers this year. We ensure full compliance with all applicable laws and regulations of the countries where operations are managed. Moreover, we expect each of our suppliers to meet the standards as defined in our Supplier code of conduct, the UN Global Compact, the UN Bill of Human Rights and the fundamental Conventions of the International Labour Organization.

We have based our supplier code of conduct on three core values, each with several topics, (see the right column):

Suppliers should not only apply our requirements to their organization but are also expected to cascade these principles through their own supply chain. The Supplier code of conduct is now part of the contracts with our supply chain partners, and CSR is one of our criteria for selecting our new suppliers. We have opened an email address and phone number where violations of the CSR policy and Supplier code of conduct can be reported. This year no violations were reported.

Ethical

- Anti-discrimination and fair treatment
- Business ethics
- Anti-corruption
- Financial Integrity

Compassionate

- Freedom of association
- Employment status
- Voluntary Employment
- Wages and benefits

Responsible

- Environmental protection
- Child labour
- Working hours
- Safe workplace
- Confidentiality

Labour rights and integrity form the basis for employment at Ecorus

Apart from safety, the happiness of our employees is paramount. We believe that happy employees will also perform better at work. We have, therefore, partnered with an external organization to conduct employee happiness surveys twice per year. In 2022, the NPS score of employee happiness was 17 (n = 54). The results from these surveys are analysed both on a management level on a business unit level. Specific measures are taken to improve the specific situations at each business unit. Next to these measures, we hold company events twice per year. In addition, we often have other social events, provide hybrid working (office / home office) and continuously improve our offices into pleasant spaces to work, hang out and relax.

We support the right for collective bargaining. Ecorus has incorporated its company collective agreements in the Employee Handbook, with topics such as salary, working hours, holidays and other types of leave, part-time and salary benchmark, overtime work, pension plan, sickness leave, integrity and many more. Furthermore, we have regular company-wide meetings in which the business status is discussed, and employees are invited to actively participate, raise questions and give feedback.

To further improve on integrity, Ecorus has not only made provisions for whistle-blowers, as described in the Ecorus Employee manual, but has appointed two confidential counsellors (vertrouwenspersonen, one male and one female) to which employees can turn in case they would like to talk about matters in full confidentiality. Ecorus has also introduced an unwanted behaviour policy and a complaint policy.

At Ecorus, we have zero tolerance for corruption, bribery and extortion. No such incidents were reported. Furthermore, the financial system has been designed such that those events are prevented. There is a clearly defined organizational governance structure, and every expenditure or contract follows a fixed approval route and includes the 'four-eyes-principle'. As a standard requirement, the finances are audited by an external accountant, accredited with 'horizontal supervision' (special accreditation in the Netherlands). In this year's financial audit, the external accountant did not find any discrepancies and closed the financial audit with compliments towards Ecorus.

Positive impact on the environment

PV solar energy is one of the sustainable energy sources which will reduce the depletion of natural resources on earth, CO2 emissions and air pollution. In addition, energy can be produced more locally at the places where the energy is needed, reducing the need to transport energy over large distances. At Ecorus, we actively promote such environmentally friendly technology. Although Ecorus intrinsically has a positive impact on the environment through designing and constructing PV installations, we continuously look at ways to further improve our environmental impact. Over the past few years, we replaced almost all of our company cars with electric cars, and we separate waste at our offices and at our PV installation projects. At our ground-mounted PV installations (solar parks), we stimulate biodiversity, e.g. by installing bee and insect hotels, sowing and growing bee-friendly grasses and plants throughout the solar park, installing special wildlife access gates in the fences or employing natural grass maintenance through sheep-grazing.

Ecorus selects and executes projects that are beneficial to the environment. These are selected according to an internal standard. Projects on unused (and for nature or agriculture unusable) land will have a preference, whereas projects that require the destruction of a lot of nature and trees are refused. Moreover, for every project, we discuss with our client how to further optimize the project towards an even more sustainable outcome. In this manner, we can ensure that the impact we have on our direct environment is nature positive.

Local participation at the heart of project development and operations

Ecorus has focused on projects with social housing cooperations from the beginning. This allows Ecorus to assist social housing inhabitants with lowering their energy bills and CO2 emissions. With an additional electricity meter connected to the Eleena digital platform, the inhabitants can follow how much energy the PV systems on their roofs produce. Careful considerations are taken in a dialogue with the social housing cooperation and the inhabitants to ensure that the installation layout and the installation and maintenance of the PV system are done in the most optimum way. This minimizes the trouble for the different stakeholders. In 2022 Ecorus will supply and build a total pipeline of around 10,000 PV systems on social housing buildings. In the first half of 2022 Ecorus Home helped 5,067 social housing inhabitants with a PV system, of which 900 have replied to the customer satisfaction review and given Ecorus a score of 7.9 out of 10.

When developing our own projects, Ecorus puts local participation at the heart of the development. As one of the spearheads of our operations and part of our manifesto, we strive for local involvement or participation. This can be, for example, through participation in the investment (and returns on investment) or through receiving the electricity from the solar installation or solar park at competitive prices. Per project, a specific method optimized for that project and local community will be chosen.

When referring to the local community, we do not only look at our downstream. We also strive to employ local subcontractors as much as possible for the construction of our projects (at Ecorus Home, Ecorus Business and Ecorus Projects). In this way, Ecorus can support the strengthening of the local economy.

Actively supporting those in need

Ecorus continuously looks at initiatives to further enlarge the positive impact it has on society. In 2022 Ecorus decided to donate 1% of our profits to charities. A big part was donated to the Cooperating Aid Organizations (Samenwerkende Hulporganisaties; SHO) under 'Giro 555' (<https://giro555.nl/>), specifically for providing humanitarian aid to the victims of the war in Ukraine. The SHO is a cooperative effort of multiple aid organizations. These work together to give humanitarian aid to people in disaster areas. The SHO cooperatively collects donations and informs the public. Another part of our profits was donated to the [SoPowerful Foundation](#). This foundation, established in 2019, is registered in the Netherlands with the mission to apply 'solar where it matters most.' This is in contexts where it impacts the lives of people at the bottom of the pyramid. The solar power installations they realize, enable or empower Healthcare, Education or access to Water. This creates (or improves) opportunities for children.

When upgrading some of our office furniture in 2022, we donated our old furniture to the second-hand shop Kringloop Centrum Zuid-Oost in Amsterdam. By donating it to this shop, we did not only enable the reuse of our furniture but also provided good office furniture at a reduced price for lower-income civilians.

UN Sustainable Development Goals .

Goal 1 and Goal 7

Ensuring access to affordable, reliable, sustainable and modern energy has been the reason for the existence of Ecorus since it was founded. It is the company's mission to ensure access to clean energy by financing, developing, building and maintaining solar energy installations.

Ecorus is active in the social housing sector. This is a sector where the end-users generally have an income lower than the average income. The recent increases in gas and electricity prices are a heavy toll on especially those people. By installing solar energy installations, these end-users will have a lower energy bill and will be more independent than when all their electricity is coming from the electricity network. Through enabling easier access to affordable, clean energy, Ecorus aims to reduce poverty.

Furthermore, Ecorus is also developing big solar energy projects, including solar farms. When developing solar farms, we strive for local involvement or participation by the local community such that the local community can directly profit from the solar farm.

Goal 11

Cities and settlements should become more resilient and sustainable. Through installing small-scale PV solar installations on residential buildings (mainly social housing), Ecorus strives to provide more local energy production. Locally sustainably produced and directly used energy can reduce the electricity production by bigger energy production plants (conventional or sustainable) and the required transportation of that electricity over long distances.

Goal 13

The sooner there is a majority of clean energy production for housing and industry, the better we can combat climate change and its impacts. At Ecorus, we focus on building as many solar energy installations as we can. We want to make an as big as possible positive impact in the fight against climate change. When there is more clean energy production, the CO2 emission will decrease faster.





Technology & Life Cycle Assessment .

Through our supply chain, Ecorus has a social and environmental impact on a local and global scale. Looking at the complete PV project, the biggest and most uncontrollable social impact happens upstream in the supply chain, especially in the area of PV module production and its supply chain.

At Ecorus, at the beginning of 2022, a technology assessment and research on the environmental life cycle analyses in the solar industry were conducted. This was followed by a specific social life cycle analysis and environmental life cycle analysis in the second part of the year.

Firstly, the conclusions from the high-level technology assessment and the research on the environmental life cycle analyses are shown. These are followed by an explanation of the Life Cycle Assessment (LCA) methodology, the results of the detailed Social Life Cycle Assessment, the results of the detailed Environmental Life Cycle Assessment, and a conclusion on the LCA studies.



**Researched by
Jan Roelofs**

High-level technology assessment and research on existing environmental life cycle analyses .

The technology behind PV systems has evolved greatly, leading to increased efficiencies and lower prices. Further developments in these technologies (especially in the field of PV modules) are on the rise and will lead to improvements in several factors, such as energy payback time and CO₂-equivalent emissions of PV projects.

Looking at these two factors, it can be seen that already a significant improvement has been made over the past years. The CO₂ savings obtained by producing energy through a PV project as compared to fossil fuel electricity production are huge. The energy payback time is around 1.2 years [2]. There are more than 14 years of PV projects in the Netherlands (most projects are based on 15 years of production time due to the SDE subsidy period) to produce energy on the positive side of the energy balance. This shows the advantages and potential of solar PV energy. Ecorus stays up to date with new technologies and applies them when they are mature enough to be technically and commercially attractive.

The major impact category on the environmental LCA and sustainability of the PV project are the PV modules. The PV modules are responsible for the biggest part of the global warming potential (equivalent CO₂ emissions) of a PV project. Here are multiple possible improvements, mainly in the silicon, wafer and PV module production. The majority of today's PV modules are produced in China. Due to lower costs, big investments and possibilities in China, the PV industry was able to grow quickly. However, it also has its downsides.

From research, it is known that the Chinese energy mix used for PV silicon, wafer and module production still contains a lot of conventional fuels (coal, oil and gas) and that the energy production in Europe is more sustainable (less CO₂ emissions, etc.) than in China. To understand the factors driving the sustainability of PV projects, we dived deeper into the LCA methodology and executed an environmental and social LCA on PV modules.

Life Cycle Assessment PV module

Ecorus aims to contribute to more sustainable societies and considers both the environmental and social aspects. We do not just aim for this during the execution of the project itself but also while incorporating the other phases of the life of the PV products. To assess the main drivers of the sustainability of PV projects and to obtain a comprehensive understanding of the social and environmental impacts of PV modules, a method called Life Cycle Assessment (LCA) was used. This analysis was done in two separate assessments: the environmental life cycle assessment (E-LCA) and the social life cycle assessment (S-LCA).

LCA Methodology

The Life Cycle Analysis (LCA) methodology generally consists of five steps:



Goal definition

For this study, the objective was to determine severe social and environmental improvement areas (hotspots) in the supply chain of Ecorus. This allows Ecorus to understand and address these hotspots, which can lead to better social conditions for the involved stakeholders and lower environmental impacts throughout the life cycle.

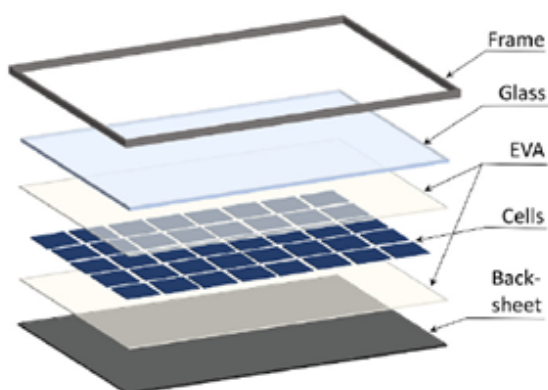


Figure 1: Structure of glass-back sheet PV module

Scope definition

This study considers a monofacial single-crystalline silicon (sc-Si) module since this is currently the most used product at Ecorus. A typical sc-PV module structure is shown in Figure 1. It generally consists of five main components: frame, glass, encapsulation material (EVA), solar cells, and backsheet. Another crucial aspect

of the scoping phase is to specify the system boundaries. As can be observed in Figure 2, this study adopts a cradle-to-grave (start-to-end) assessment, meaning that the material, product manufacturing, transport, installation, and end-of-life are included. The supply chain of the PV module generally consists of the following production steps:

- Extracting high-grade quartz, which can be found in vast deserts (mostly in rural areas).
- ↓
- Then the high-grade quartz is melted into metallurgical-grade silicon (MGS).
- ↓
- This MGS is refined and the resulting high-purity product is polysilicon.
- ↓
- This type of silicon is purified and mono-grade silicon that results from this is melted into monocrystalline silicon ingots, which are then thinly sliced into silicon wafers.
- ↓
- Then the wafers are converted through a sequence of wet and high-temperature chemical processes into cells
- ↓
- Finally, the cells are interconnected and sandwiched between glass and plastic sheets.

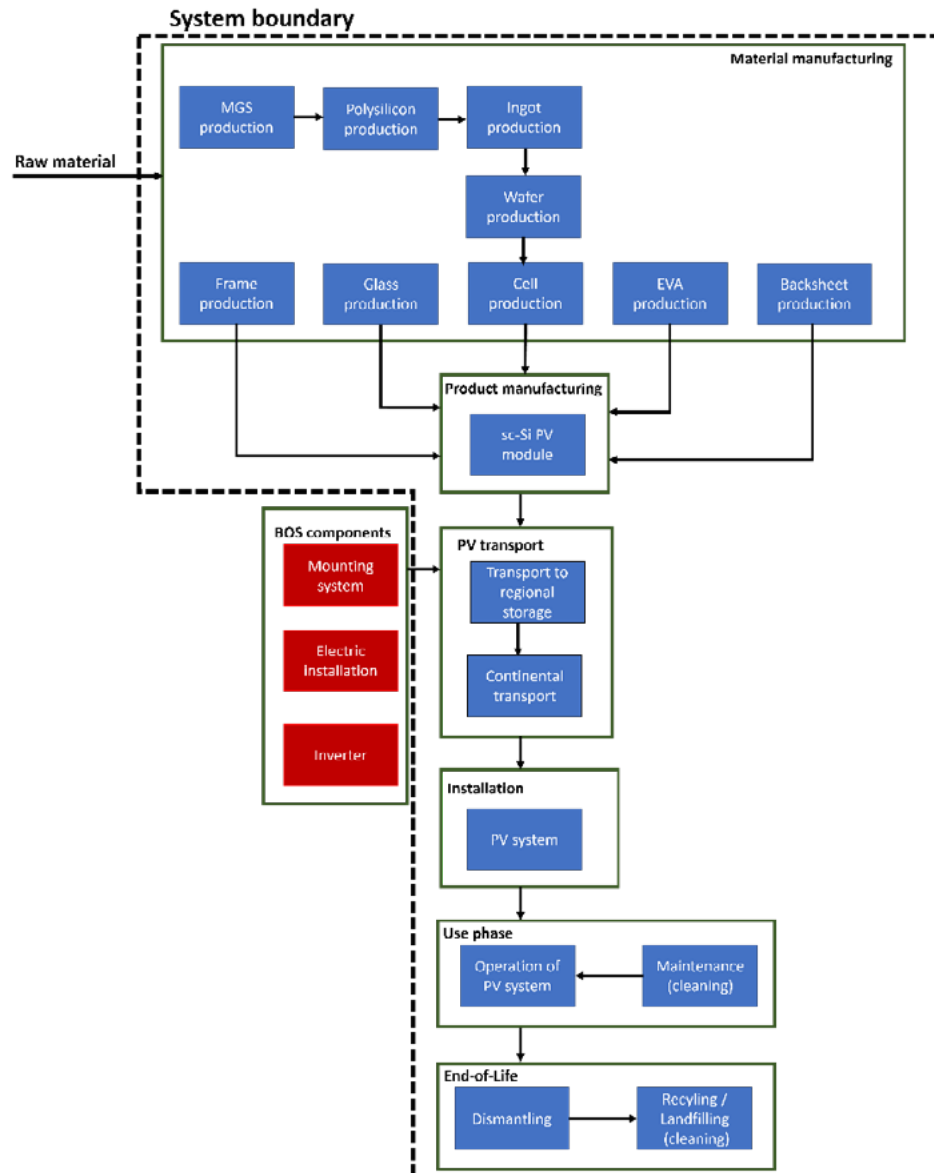


Figure 2: System boundaries

Since solar panels do not emit greenhouse gas emissions during operation, and the emissions during maintenance activities are low, the operations and maintenance phase is neglected in the E-LCA. Furthermore, because the PV module is the major emphasis, the Balance of System (BOS) components (all components of a PV system other than the solar panels, such as cables, switches, mounting systems and inverters) are disregarded in the assessment.

Furthermore, for calculation and analysis purposes in the E-LCA, we use a Functional Unit (FU), which is defined as 1m² of PV solar module surface. Because the S-LCA typically uses semi-quantitative and -qualitative data, a specific FU is not suitable for the S-LCA.

Collection of LCI data

The Life Cycle Inventory (LCI) aims to define the data required to assess the environmental and social impacts of the considered product. Table 1 shows the LCI used for the E-LCA.

Stage	Explanation
Material manufacturing	This inventory is based on the most recent consensus LCI among PV E-LCA experts and presented by Frischknecht et al. (2020). This LCI comprises precisely calculated inputs and outputs for all sc-Si manufacturing processes, such as the manufacturing of the cells, wafers, and modules. In addition, the worldwide environmental database Ecoinvent was used for gathering background data and for estimating industry process emissions. Due to its extensive database of over 18,000 processes from numerous industries, Ecoinvent is a frequently used database for life cycle analyses.
Product manufacturing	
Transport	The transportation of the PV module from China to the Netherlands is based on intercontinental freight ships from the harbor of Shanghai to Rotterdam. Additionally, the PV modules are distributed by trucks to the project locations. This data is obtained through our own modelling.
Installation	The installation stage of the PV modules is incorporated by including all machinery involved (power generator, forklift, excavator, etc.). This data is obtained through our own modelling.
End-of-Life	The End-of-Life (EoL) treatment is modeled based on Frischknecht et al. (2017) and assumes the recycling of glass, frame and cabling, while silicon components and polymers are landfilled or burned.

Table 1: Life Cycle Inventory for E-LCA

The S-LCA intends to reflect the involved stakeholders of the different life cycle stages. This social assessment focuses on the material and product manufacturing and installation phases. Regarding the latter, questionnaires were held with workers of three different installation partners of Ecorus. Besides, to represent the Chinese workers, the following sources were used (due to anonymity purposes, names are not mentioned):

- Solar supply chain expert: has been keeping up to date on international supply chains in the solar sector and has visited around 100 Chinese MGS smelters since 1999.
- Dutch embassy in Beijing: specialized in human rights in China.

- CSR manager of our main PV module supplier: a questionnaire was sent to represent the people working in the factories that manufacture the ingots, wafers, cells and modules.
- HollandSolar: the Dutch solar industry association since 1983.

The required data to represent the involved workers during the installation was obtained by directly interviewing employees from the installation parties. The inventory data to reflect the remaining stakeholders (local community, society, children and customers) was gathered through desktop research.

Performing the Life Cycle Impact Assessment (LCIA)

In the LCIA, the inventory data was translated into environmental and social impact scores. In the case of the E-LCA, this was executed by cause-effect modeling in the Activity Browser software. Simultaneously, the S-LCA converted the indicators into a numerical value, after which all indicators were aggregated into a single value per stakeholder group.

Interpretation

The last phase of the LCA is the interpretation phase where results are evaluated and analyzed.

Environmental Life Cycle Analysis

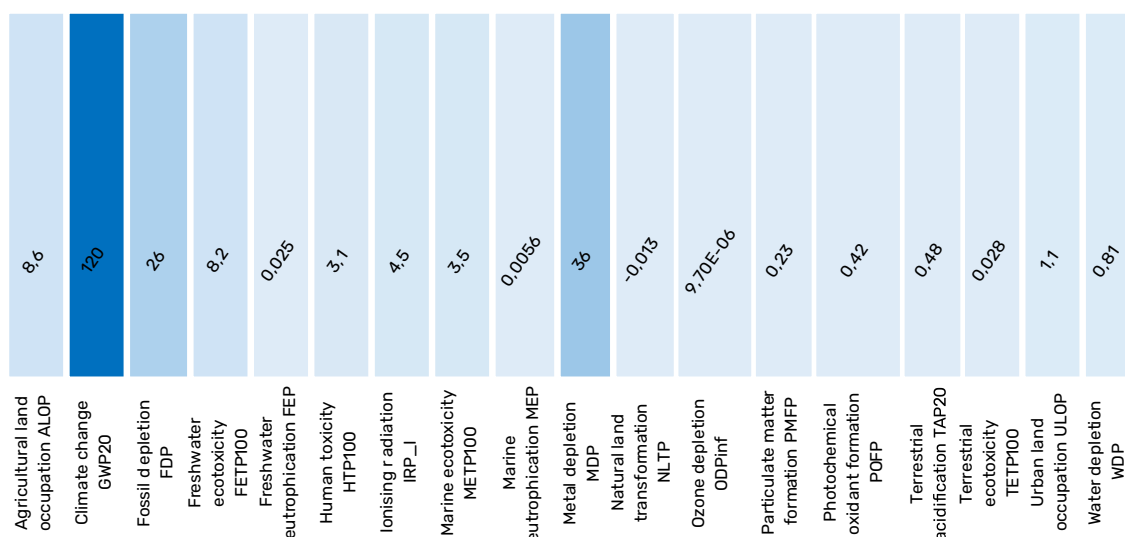
First, this chapter starts with presenting and discussing the general life cycle impact assessment results. Second, all individual impact categories will be discussed and evaluated based on which processes are most influential. Third, the sensitivity analysis is demonstrated to identify the influence of the electricity mix on the results. Finally, the installation stage will be discussed extensively since this stage can be influenced directly by Ecorus.

Life Cycle Impact Assessment

Figure 3 shows the results of the life cycle impact assessment. The color grading indicates the significance of the impact categories (darker means more impact) for the 18 impact categories.

Based on this table, the following impact categories will be discussed in more detail since these seem to have the highest environmental impact: agricultural land occupation, fossil depletion, metal depletion and climate change.

Figure 3: General life cycle results



An aerial photograph showing a dense green forest on the left and a cleared, brownish area on the right. A blue excavator is visible in the bottom right corner of the cleared area. The text is overlaid on the forest side.

Agricultural land occupation

The agricultural land occupation category represents the surface of agricultural land occupied per year (m²/year). All life cycle stages account for up to 8.6 m²/year, of which 4.0 m² is used to manufacture the pallet and 1.06 m²/year is related to the manufacturing of the PV cells. The land occupation of the pallet is primarily due to the wood needed to produce the pallet. For this reason, Ecorus will start exploring opportunities to extend the lifetime of its pallets and will also investigate opportunities to plant trees.

Metal depletion

Depletion is defined as the process in which a resource's rate of consumption exceeds its rate of replenishment. Although this impact category contains many different types of metals, it is represented by the equivalent amount of iron (expressed in kg Fe-Eq). For the PV module, 35.8 kg Fe-Eq is required. The main contributors are:

- The required tin for soldering the electronic connections (76%)
- The metallization paste, which is a substance that improves the module performances (5.4%)
- Solar glass production (4%)

The most effective and theoretical measure to reduce metal depletion would be to scale down the tin needed for the PV module. However, the majority of the existing and price-competitive PV technologies currently rely on tin-based connections, implying that alternatives are unfeasible for the time being.

Fossil depletion

This impact category represents the amount of extracted fossil fuels, which are represented by the equivalent amount of oil (oil-Eq) and accounts for 26.4 kg oil-Eq for the entire life cycle of a PV module. The most significant process contributors are the Chinese electricity mix (10.7 kg oil-Eq), the aluminum frame (3.82 kg oil-Eq), the solar glass (2.54 kg oil-Eq), End-of-Life (2.14 kg oil-Eq) and the EVA layer (1.73 kg oil-Eq), see figure 4. Fossil depletion is heavily influenced by the electricity mix, implying that adopting more green energy to the electricity mix can reduce this impact category.

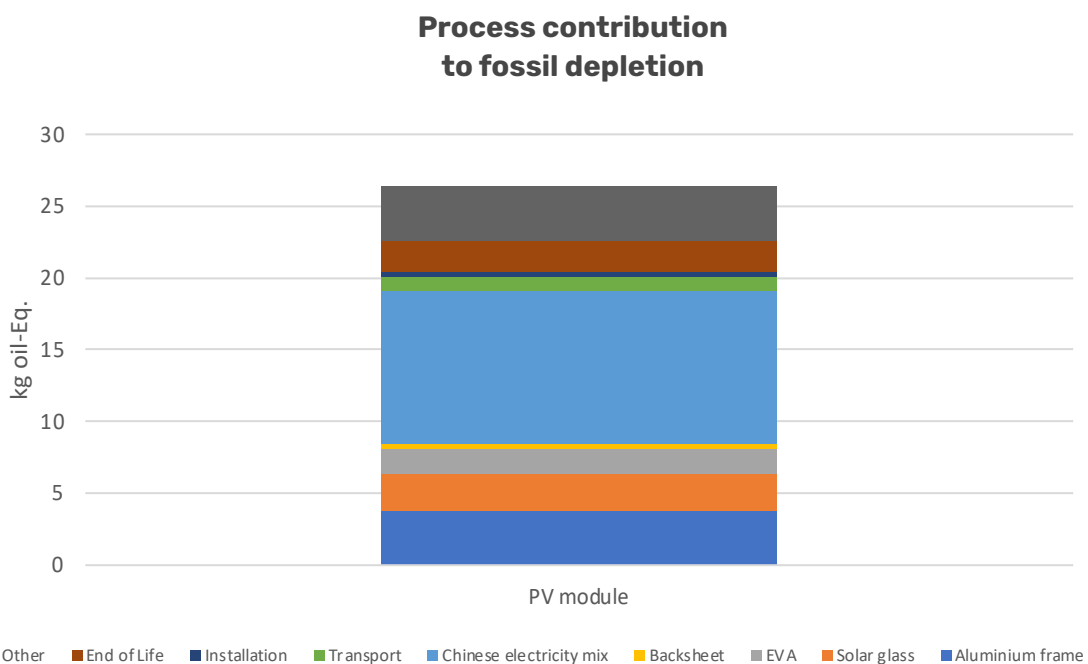


Figure 4: Process contribution to fossil depletion

Climate change

Climate change refers to long-term changes in temperature and weather patterns and is expressed in CO₂-Eq. The PV module is responsible for 117.0 kg CO₂-Eq. Figure 5 indicates the contributions of the involved processes to climate change. This figure shows that a major part is caused by the Chinese electricity mix, which contributes 41.9 kg CO₂-Eq to the total emitted CO₂-Eq. This relatively high value is mainly caused by the high share of coal-fired plants in the electricity mixes that results in more greenhouse gas emissions. Furthermore,

Figure 6 demonstrates the high electrical demands for polysilicon and ingots production, resulting in emission-intensive phases within the life cycle of a PV module. Other remarkable processes that heavily contribute to climate change are End-of-Life management (19.1 kg CO₂-Eq), aluminum frame production (17.0 kg CO₂-Eq) and glass production (10.6 kg CO₂-Eq). In conclusion, within the life cycle of a PV module, the most effective measures would be to make the polysilicon and ingot processes more efficient or to incorporate more renewables into the electricity mix.

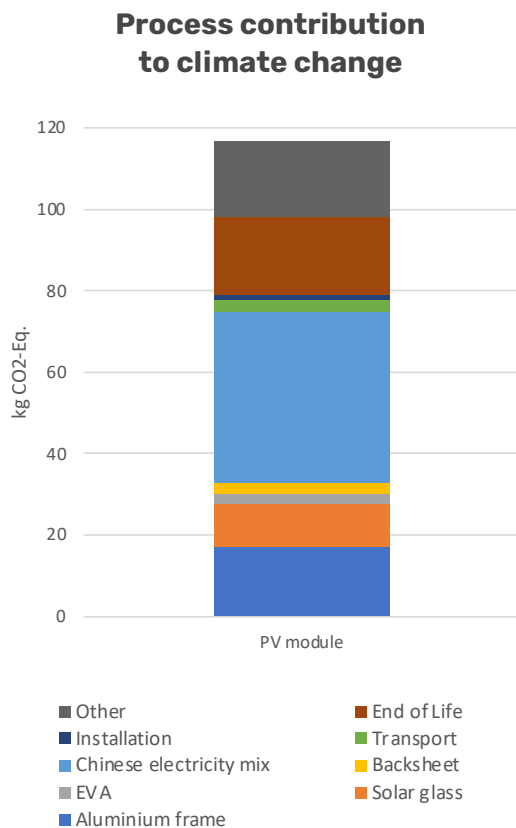


Figure 5: Process contribution to climate change

Electricity usage per production process [kWh]

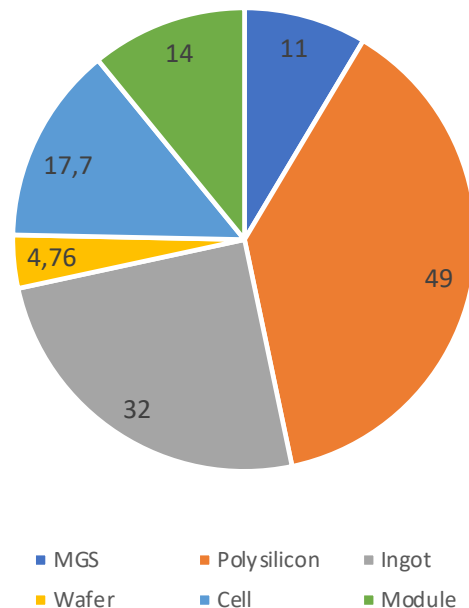


Figure 6: Electricity usage per production process

Interpretation

The previous chapter demonstrated the environmental impact of a solar panel. It can be concluded that the electricity mix heavily contributes to the impact categories, which highlights the potential of integrating renewables into this mix. Therefore, an analysis was executed to investigate the environmental impact when adopting the Chinese electricity mix outlook for 2035 and 2050. This is visualized in Figure 7 [3]. This figure shows that the environmental impacts of solar panels will considerably be reduced in the upcoming decades.

Although most of the environmental impacts are caused during manufacturing, Ecorus still aims to minimize its impact during our own operations (installation). The construction of a

solar plant involves numerous pieces of machinery, all of which impact the environment. For a ground project, the following types of machinery are frequently used:

- Forklift truck: for transporting materials.
- Ramming machine: for direct ramming of steel cross-section into the ground (to attach the panels).
- Excavator: for digging that allows for cable management.
- Generator: for supplying the site (equipment) with its necessary energy.

Percentual increase in environmental impacts for different installation scenarios

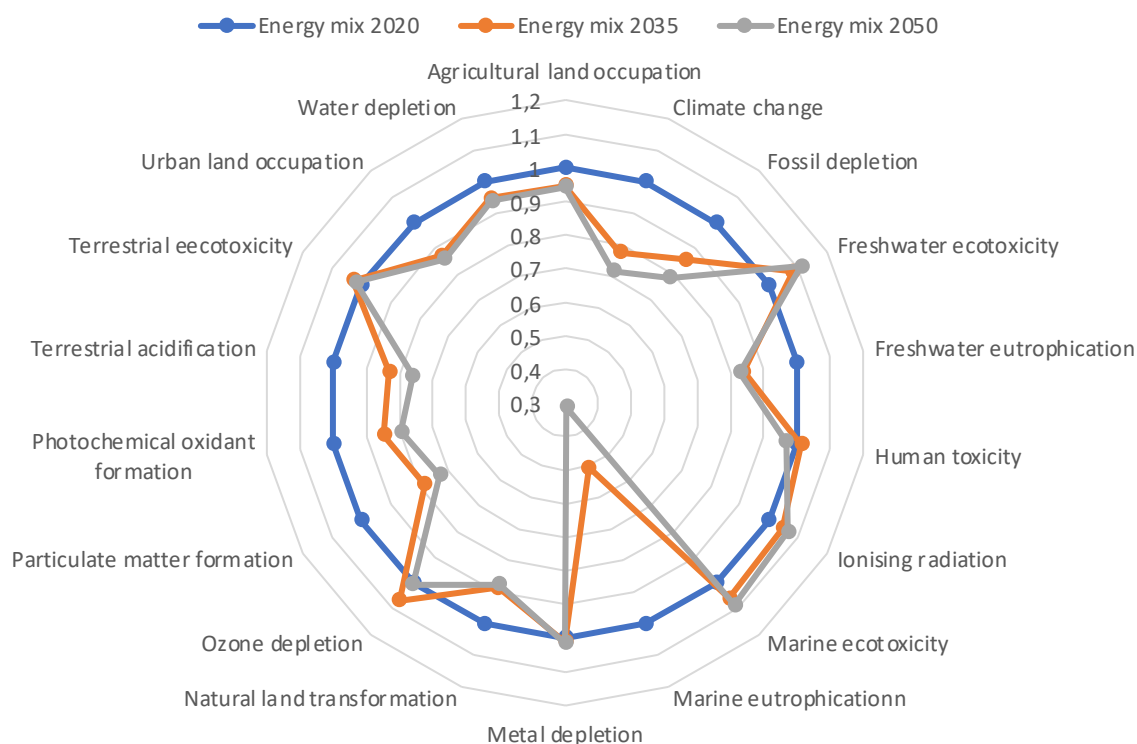


Figure 7: Impact of the electricity mix on the environmental impact categories

These machines generally operate on diesel due to the high power demands. The diesel generator, however, is often equipped with a battery pack to reduce the required fuel (base case). Figure 8 shows the percentual change in environmental impact for different installation scenarios compared to the base case. This figure shows that the environmental impacts are significantly increased if the battery pack is excluded; however, it also shows the potential of powering the site with a grid connection.

The latter can be obtained by timely requesting a grid connection to the grid operator. Ecorus aims to adopt this in future project management. Unfortunately, there are currently few alternatives to renting electricity-powered machinery since high power is required for the working activities. However, Ecorus will remain in close contact with the rental companies to stay updated on any innovative green alternatives.

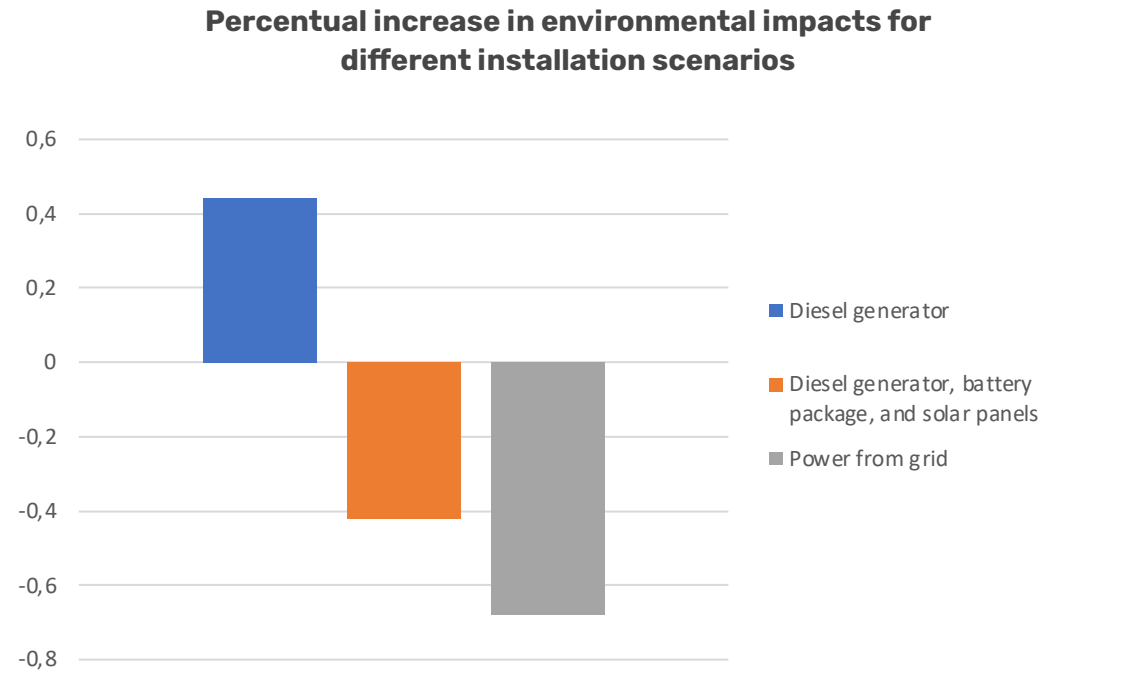


Figure 8: Percentual change in environmental impacts for different installation scenarios

Social Life Cycle Analysis

This S-LCA aims to identify social impacts that may affect involved stakeholders along the life cycle of a solar panel. For this purpose, the Guidelines for Social Life Cycle Assessment of Products developed by the UNEP/SETAC Life Cycle Initiative was adopted [4]. Generally, social impact can occur in five stakeholder categories: workers (during all production steps), the local community, society, children and consumers. These stakeholders have been evaluated in terms of the suggested impact categories (refer

to Table 2) and indicators suggested by the Methodological Sheets for Subcategories in S-LCA 2021 [5].

Table 3 demonstrates the aggregated S-LCA results for each stakeholder group. This aggregated value is based on the arithmetic average of all indicators for each stakeholder group, ranging from 0 to 1. Here a value of '1' means a positive outcome of the assessment and that no social impacts were discovered.

	Worker	Loc. community	Consumer	Society	Children
Impact category	Freedom of association and collective bargaining	Access to material resources	Health and safety	Public commitments to sustainability issues	Education provided in the local community
	Child labor	Delocalization and migration	Feedback mechanism	Contribution to economic development	Health issues for children as consumers
	Fair salary	Cultural heritage	Consumer privacy	Prevention and mitigation of armed conflicts	Children concerns regarding marketing practices
	Working hours	Safe and healthy living conditions	Transparency	Technology development	
	Forced labor	Respect of indigenous rights	End-of-Life responsibility	Corruption	
	Discrimination	Secure living conditions		Poverty alleviation	
	Health and safety				
	Social benefits				
	Employment relationships				
	Sexual harassment				

Table 2: Stakeholder categories and subcategories as used in this assessment; these follow the UNEP 2020 Guidelines

Stakeholder group	Life cycle stage	Average value
Worker	MGS & Polysilicon	Unknown
	Ingot, Wafer, Cell, and Module	1
	Installation	0.83
Chinese Local community	All manufacturing stages	0.9
Society	All manufacturing stages	0.9
Children	All manufacturing stages	0.75
Consumer	Use phase and EoL	1

Table 3: Normalized results for each stakeholder group



Stakeholder group: Worker - MGS & Polysilicon

Currently, there is a lack of supply chain transparency. This makes it complex to assess this chain on possible social impacts. Nevertheless, Ecorus made a first attempt to create a high-level identification of a typical solar supply chain. The solar supply chain expert who was interviewed estimated that 75% of the Metallurgical Grade Silicon (MGS) is produced in China and that the global share of polysilicon produced in China would be approximately 70%. This highlights the solar industry's dependency on Chinese production. It seems that a major part of the global MGS and polysilicon is produced in Xinjiang, which is a large province in the north-west of China with many industrial activities. Although no concrete data is known, it appears that this region accounts for 38% of Chinese MGS production and 40% of global polysilicon production. Due to a lack of supply chain transparency, it is currently unknown whether a solar panel manufactured anywhere in the world comprises solar components that originated from Xinjiang. Today only circumstantial evidence exists that suggests forced labor by Uyghur minorities in this region. Although no official evidence is there, Ecorus will proactively monitor any developments in this regard.

Stakeholder group: Worker - Ingot, Wafer, Cell and Module

To date, no evidence of forced labor has been found in Chinese PV module factories [6]. Ecorus discussed its concerns regarding sustainability, working conditions and human rights with its suppliers and obtained additional information through a CSR questionnaire sent to several suppliers. These outcomes, as well as the sustainability report of our supplier, are incorporated into the analysis. No social impacts were discovered. Therefore, Ecorus considers its supplier as sustainable.

Stakeholder group: Worker - Installation

Practically all workers installing solar panels are contracted through a subcontractor. The smaller projects are generally executed by Dutch subcontractors, which have a reduced risk of violations of working conditions, sustainability and human rights. For the bigger projects, the majority of the workers come from East-European countries, such as Bulgaria and Poland. These migrant workers especially are more vulnerable to abuse since most of these people lack the knowledge of the local language and laws, have only one livelihood option and may

belong to a minority religious or ethnic group. Despite the fact that most of the installation parties have not proclaimed any policy regarding working conditions or human rights, no social impacts have been identified for this stakeholder group. Even though the working hours comply with national legislation, Ecorus will closely monitor them. Extra attention will be paid to the working times of the installers, as the associated risk of exceeding the maximum number of allowed working hours is considered high.

Stakeholder group: Local Chinese community

The greatest social impacts for this stakeholder group are expected in the form of rare material resource use. This denotes the importance of recycling and, thus, recovering scarce materials. Ecorus will monitor technological innovations in PV technologies that lessen the use of toxic or rare materials. However, over the past 40 years, the number of people in China with incomes below \$1.90 per day – the International Poverty Line as defined by the World Bank to track global extreme poverty – has fallen by close to 800 million. With this, China has contributed close to three-quarters of the global reduction in the number of people living in extreme poverty. At China's current national poverty line, the number of poor fell by 770 million over the same period [7].

Stakeholder group: Chinese Society

The solar industry is expanding as more renewables are incorporated into the energy mix. Over 30 billion USD was exported from China to other countries all over the world, accounting for nearly 7% of the country's five-year trade surplus [6]. The numbers are consistent with rising R & D expenditures, efficiency improvements and revenue increases. However, for this stakeholder group the main social risk is posed by China's unfinished fight on relatively high corruption perception index. Corruption has the potential to erode the trust of society in the

public sector, and it can also waste taxes that were initially allocated to, for example, important community projects. This can be tackled by monitoring the suppliers and implementing an ethical code for the Ecorus employees that have contact with suppliers (and customers) and are in higher management positions.

Stakeholder group: Children

To ensure the same welfare and well-being for the future generation as the current generation, this stakeholder group was added to consider the social dimension of sustainability. Although several projects have been launched by our supplier to enhance children's health and education, China can improve in providing equitable access to education, particularly in rural areas. Especially the MGS and polysilicon processes take place in rural areas, which can result in an increased likelihood of child labour in these regions. However, no cases of child labour are identified during any process within the solar supply chain. Ecorus will monitor this closely.

Stakeholder group: Consumer

The results for the consumer stakeholder group indicate that good social performance for the consumers is accomplished. In terms of privacy and transparency, no social impacts were discovered. This is mainly avoided by complying with the strict regulations in the Netherlands on these themes. Given the huge waste streams that will arise in the coming decades, it is essential that the End-of-Life management is set up properly. Recycling solar panels after their lifetime is heavily stimulated by European regulations and is currently also extensively researched. Additionally, although it can be complex to reuse solar components from an economic perspective, the components of solar panels have the ability to be reused. Ecorus also recognizes the importance of appropriate EoL management and, therefore, starts orientating how we can stimulate recycling possibilities.



Summary & Action plan

Focus on CO2 emission reduction

Since Ecorus was founded in 2010, it has always valued sustainability and corporate social responsibility (CSR). All our projects already contain multiple CSR aspects. At the end of 2021 Ecorus decided to further formalize this and joined the UN Global Compact. In 2022 the values and principles of the UN Global Compact specifically, and CSR in general, have been transformed into company policies and other strategic and operational procedures and documents. Several actions to improve CSR performance have been taken. Furthermore, the social and environmental impacts have been analysed, and a thorough Life Cycle Assessment (LCA) has been executed. This lays the foundation for short-term assessments, evaluations, actions and a long-term CSR strategy. Ecorus will set several CSR-related KPIs and will continuously improve CSR performance and impact, for example, by staying updated about innovative technologies that could lower the environmental or social impacts.

The excessive amounts of CO2 that are currently emitted are the main cause that our planet is slowly being killed. Even though PV solar energy emits far less CO2 than conventional energy sources, some CO2 is emitted over the lifetime of a PV project (and especially during production, transport construction and recycling). Ecorus will focus on CO2 emission reduction in a long-term CSR strategy and follows the 'Scope 1, 2 and 3' as defined by the GHG Protocol Corporate Standard.

- **Scope 1:** Direct Greenhouse Gas (GHG) emissions from sources that are owned or controlled by the company.
- **Scope 2:** Electricity indirect GHG emissions from the generation of purchased electricity consumed by the company.
- **Scope 3:** Other indirect GHG emissions from sources that are not owned or controlled by the company such as sources downstream and upstream in the supply chain.

Short-term action plan

At Ecorus, we first focus on scope 1 and scope 2 emissions, which are more directly controlled emissions. In parallel, Ecorus will work on scope 3 emissions together with the partners in the supply chain. Firstly, in 2023 we will map and measure our scope 1 and scope 2 emissions. This will be followed by concrete actions, such as:

- In 2023 we will explore opportunities to extend the lifetime of our used pallets and explore opportunities to support tree planting projects. The latter is a relatively simple but effective measure to reduce environmental impacts. From the Environmental LCA, it was determined that the use of pallets for transporting the PV modules significantly contributes to the agricultural land occupation impact category.
- Electrification of the company cars. We have already started this process; the majority of our cars are electric vehicles. We aim to have a fully electric fleet of company cars by 2025.
- Reduced energy use of our offices. We moved our main office (Eindhoven, NL) in 2021 to a sustainable building (energy label A). We aim to have our office in Amsterdam, NL also at an energy label A building by 2025. Furthermore, all energy used and purchased for our office use should be fully based on renewables by 2025.
- Lower conventional energy use on construction sites. For our ground-mounted projects, we will strive for an earlier electrical grid connection which we can use during the construction phase of the project. Thereby, we remove the need for fossil-fuel-based generators. Additionally, we aim to use a minimum of 80% electrical construction site equipment and machinery in 2025.

- Revise the supplier code of conduct in 2023. Based on the LCA results, the supplier code of conduct of Ecorus will be revised and, if necessary, adjusted to enhance the social and environmental conditions along the supply chain.
- Work more closely with HollandSolar, the Dutch association for the solar industry, to promote greater transparency in the solar supply chain. Ideally, this would lead to the identification of the involved parties and the origins of all components of a solar panel.

Mid-term action plan

Ecorus aims to achieve net-zero emissions on scope 1 and scope 2 emissions by 2030. Before 2030 we also want our suppliers (scope 3) to make considerable steps in terms of sustainability and GHG emission performance. We will discuss with our current suppliers roadmaps and action plans. Furthermore, we will investigate environmentally friendly alternatives to our current supply-chain hotspots.

Ecorus will proactively follow up on End-of-Life possibilities (such as reusing and recycling). From the Environmental LCA, it can be concluded that this phase considerably contributes to the overall environmental impact, while the Social LCA also shows the importance of recycling. Ecorus aims that by 2030 all of the PV modules taken out of service are reused or recycled.

Long-term action plan

By 2040 Ecorus aims to procure only from suppliers that have achieved net-zero GHG emissions (scope 3).

By 2050 Ecorus aims to serve only customers that have achieved net-zero GHG emissions (scope 3).

About this CSR Report

Dear Reader,

Thank you for your attention in reviewing our very first CSR report. Ecorus exists for the sole purpose of making our world a better place to live in for ourselves and our children. It is our intrinsic motivation to do good and make an impact on the world with positive solar energy. This is the first year in which we document what we have done in the current year. With your support and dedication to making a difference yourself, we are fully energized to take on the monumental challenge that our age requires: to successfully complete the energy transition before the world cannot sustain our way of life any longer. We invite you to open up the dialogue with us and share proposals to further our mission together. We hope to bring you many more updates in 2023. It is good to be with you. Shine Bright.

Yours Truly,



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Written: November 2022

Published: December 2022

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