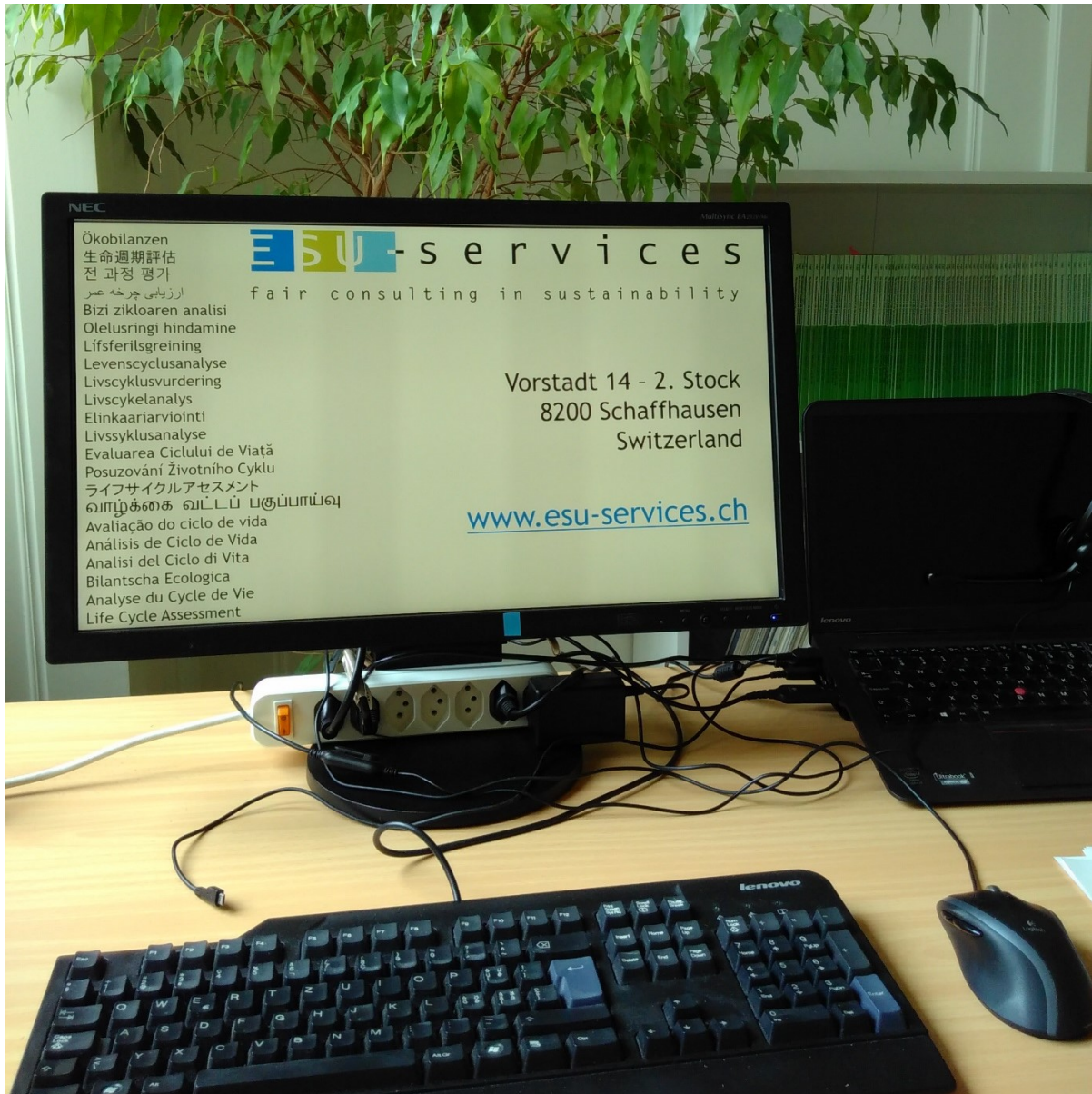


Environmental report and product declaration 2019



Environmental report and product declaration 2019



Authors

Niels Jungbluth; Martin Ulrich; Christoph Meili; Maresa Bussa

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About us	<p>ESU-services Ltd. has been founded in 1998. Its core objectives are consulting, coaching, training, and research in the fields of life cycle assessment (LCA), carbon footprints, water footprint in the sectors energy, civil engineering, basic minerals, chemicals, packaging, telecommunication, food and lifestyles. Fairness, independence, and transparency are substantial characteristics of our consulting philosophy. We work issue-related and accomplish our analyses without prejudice. We document our studies and work transparency and comprehensibly. We offer a fair and competent consultation, which makes it for the clients possible to control and continuously improve their environmental performance. The company worked and works for various national and international companies, associations, and authorities. In some areas, team members of ESU-services performed pioneering work such as development and operation of web based LCA databases or quantifying environmental impacts of food and lifestyles.</p>
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Abstract

Sustainability is the core of our consulting activities. With this report we inform our customers about the measures we take for reducing the environmental footprint of our own consulting services. Furthermore, we show how we improve the social and economic sustainability.

In this report the environmental impacts of our services are calculated and shown in an environmental product declaration (EPD). Business trips are crucial factor for the impacts of single projects. Therefore, they are calculated separately from the general impacts of the service. Another key factor, which is seldom considered in this type of reporting, is the insurances we take for our employees.

With this data basis we can also report the full environmental impacts of our services after finalization of a project.

All permanent staff members have a GA travel card which allows them to use all public transport in Switzerland for free. This is also used for commuting. Train is our preferred means of transportation for national and international business travelling. If it is necessary to use a car, we can rely on the car sharing organization Mobility. Airplane trips are not compensated to avoid wrong incentives (further explanation, see chapter 2.3.3).

Our suppliers are chosen also on basis of their sustainable performance. For example, we use Fairphone and recycling or FSC certified paper. We use the regional offer for naturemade star certified electricity “CleanSolution StarFlex” provided by SH power.

We offer all staff members to also work part time in order support families and work-life balance. Salaries are on basis of talent and not influenced by age or gender. Additionally, we actively discourage structural overtime.

We actively support our customers for developing sustainable business practice. There are special consultancy rates for NGO's.

Kurzfassung

Die Schonung der natürlichen Ressourcen und eine nachhaltige Wirtschaftsweise stehen nicht nur im Mittelpunkt unserer Beratungsangebote. Auch für die Führung unseres Unternehmens sind dies wichtige Massstäbe.

In diesem Umweltbericht werden die Umweltbelastungen, der durch uns angebotenen Dienstleistungen, unter Berücksichtigung möglichst aller relevanten Aspekte untersucht. Im Bericht werden dazu die wichtigsten Verursacher der Umweltbelastungen aufgezeigt. Der Bericht dient dazu Verbesserungsmöglichkeiten festzulegen. Mit einer Umweltdeklaration werden die Belastungen für die angebotenen Dienstleistungen ausgewiesen.

Der Umweltbericht der ESU-services GmbH zeigt, dass die jetzt verursachten Umweltbelastungen pro Beratungsstunde vor allem über Geschäftsreisen beeinflusst werden können. Nach Möglichkeit versuchen wir alle Reisen in Europa mit der Bahn durchzuführen. Für unbedingt notwendige Autofahrten gibt es eine Mitgliedschaft beim Carsharing «[Mobility](#)». Flugreisen werden nicht kompensiert, um falsche Anreize zu vermeiden (Erklärung siehe Kapitel 2.3.3).

Andere Faktoren wie die Höhe des Energie- und Wasserverbrauchs und Infrastruktur sind nur begrenzt beeinflussbar. Für unseren Strombedarf kaufen wir eine entsprechende Menge Ökostrom, die mit dem [naturemade star](#) Label zertifiziert wurde, bei unserem lokalen Versorger [SH Power](#) ein.

Für die Rentenversicherung ist ESU-services Mitglied bei der Versicherung „[Abendrot](#)“, die eine nachhaltige Anlagepolitik betreibt.

Das Pendeln hängt vom Wohnort der Mitarbeiter ab und ist damit auch eine individuelle Entscheidung. Für geschäftliche und private Fahrten wird den fest angestellten Mitarbeitern ein Generalabonnement für den öffentlichen Verkehr zur Verfügung gestellt.

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Abbreviations

	Deutsch	English
CH	Schweiz	Switzerland
EPD	Umweltproduktdeklaration	Environmental Product Declaration
ISO	Internationale Organisation für Normung	International Organization for Standardization
LCA	Ökobilanz	Life Cycle Assessment
GWP	Klimaänderungspotential	Global Warming Potential
PCR	Produktkategorie-Regeln	Product Category Rules
RER	Europa	Europe
SH	Schaffhausen	Schaffhausen
UBP	Umweltbelastungspunkte	Eco-points

1 About ESU-services Ltd.

ESU-services Ltd. was founded in 1998. Its core business is research, consulting, review and training in the field of Life Cycle Assessment (LCA). This methodology aims to investigate environmental aspects of products and services from cradle to grave, from resource extraction to manufacture, use and end of life treatment. We also work with related methods such as carbon footprinting and Input-Output-Analysis.

Fairness, independence, and transparency are the main characteristics of our consulting philosophy. We work issue-related and accomplish our analyses without prejudice. We document our studies and our work in a transparent and comprehensible manner. We offer a fair and competent consultation, which enables our clients to control and continuously improve their environmental performance.

ESU-services covers several economic sectors such as energy, basic minerals, metals and chemicals, biomass, transportation, waste management, information technology, food, and lifestyles. ESU-services also contributes to the development of impact assessment methods such as ecological scarcity method. Since 2007, ESU-services runs the Regional SimaPro Competence Centre of Liechtenstein, Switzerland, Germany, and Austria.

The range of services offered by ESU-services GmbH comprises the following core areas:

- Project management in ground-breaking life cycle assessment projects such as ecoinvent and the "Life Cycle Assessment of Energy Products".
- LCA case studies on energy systems, biofuels, food, packaging, lifestyles, transport, electronics, materials, construction products and many other sectors.
- Environmental extended input-output analysis.
- Other methods such as climate balances (CO₂ footprint, carbon footprint) and water balances, environmental footprint, energy analyses, ecological footprint, biodiversity footprint or transport balances.
- Material and substance flow analyses (MFA and SFA).
- Balance of a company's total emissions including the flow of goods (organizational life cycle assessment).
- Consulting on life cycle and supply chain management.
- Data collection for life cycle assessments according to the ecoinvent methodology, e.g. for food or photovoltaics.
- Sale of life cycle inventory data for various areas.
- Development of impact assessment methods, e.g. method of ecological scarcity (environmental impact points).
- Critical review of life cycle assessments according to ISO 14040 and other standards.
- Advice on the development of standards for life cycle assessment.
- Sales and training for the world's leading LCA software SimaPro, the web-based LCA tool e-DEA or the simplest LCA solution EarthSmart.
- Organization of workshops such as the life cycle assessment discussion forum (Discussion Forum on Life Cycle Assessment).

2 Environmental product declaration

2.1 Methodology

This implementation of an environmental product declaration is broadly based on the product category rules (PCR) for environmental science and engineering research and development services (PCR 2012). This PCR is based on ISO Standard 14025 for the implementation of environmental declarations (International Organization for Standardization (ISO) 2006a).

Deviating from the PCR, the latest versions of the indicators as described in the general programme instructions for the international system (EPD 2019) is used. The indicator for water scarcity is not shown as the present implementation of the method in SimaPro does not fit with the used background databases.

The method of life cycle assessment (LCA) according to ISO 14072 was used to quantify the environmental impacts (International Organization for Standardization (ISO) 2014) for the whole organization. The impacts per consulting hour are recorded according to ISO 14040 (International Organization for Standardization (ISO) 2006b). This method is based on a life-cycle approach, whereby the environmental impacts of a product or organization are recorded and evaluated from the extraction of raw materials through production and use to the disposal phase (from cradle to grave).

No external review or verification of the report has been conducted to date. It is therefore currently an "Environmental Supplier Declaration according to ISO 14021" (International Organization for Standardization (ISO) 2016).

2.2 Goal

This environmental report examines the environmental impacts of the services we offer, considering as many relevant aspects as possible. The report identifies the main sources of environmental pollution. The purpose of the report is to inform our customers about environmental impacts caused by our services and identify potential areas for improvement. Our first annual environmental report was published in 2014.

2.3 Scope and system description

2.3.1 Functional unit

The functional unit of the EPD refers to 1 hour of consultancy services provided in 2019.

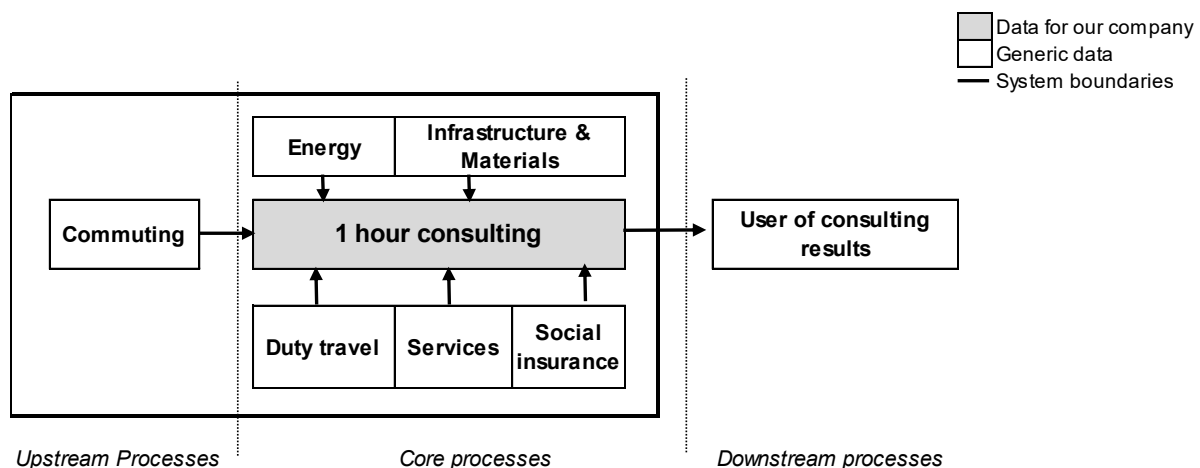
2.3.2 System boundaries

According to the product category rules used (PCR 2012), all environmentally relevant resource consumption and emissions for the investigated system are considered in the LCA as shown in Tab. 2.1. For the impact assessment the latest implementation of the EPD method is used in SimaPro (EPD 2018). A distinction is made between upstream and core processes. The standard "upstream processes" only include individual commuting, as this is not causally related to the service sold. The permanent employees of the company receive a general subscription to public transport (Swiss General Abonnement - GA), which is also used to travel to their place of work. All environmentally relevant processes used for core services are reported under the category "Core processes".

In contrast to the requirements of the above-mentioned PCR, this life cycle assessment is prepared without cut-off criteria. This means that all processes are included, even if their contribution to the overall balance sheet is below a certain threshold. In addition, some processes, such as statutory social insurance, are also included in the balance sheet, although this is not required under the underlying PCR. The reported burdens are therefore higher (see result in Tab. 2.3) than is the case for balance sheets that are carried out exactly in accordance with this PCR.

- Upstream process:
 - Individual commuting
- Core processes:
 - Energy consumption (electricity and heat)
 - Infrastructure and material consumption (share of buildings, water consumption, paper, IT and electronic equipment, tea and coffee)
 - Business trips including hotel accommodation
 - Social security funds
 - Purchased services (telecommunications, training and accounting)
 - Disposal of waste and wastewater

Tab. 2.1 System description for calculating the organizational LCA (PCR 2012)



2.3.3 Offsetting / compensation of environmental impacts

A carbon offset is a reduction in emissions of carbon dioxide or other greenhouse gases made to compensate for emissions made elsewhere. Offsets are measured in tonnes of carbon dioxide equivalent. One tonne of carbon offset represents the reduction of one tonne of carbon dioxide or its equivalent in other greenhouse gases.

There are service providers and projects on the market that allow to offset greenhouse gas emissions related to e.g. travel by air or car or any other activity. It is tempting to just pay a small amount of money to offset all the emissions related to one owns activities and claim that the business is than acting carbon neutral.

However, this is a misleading and not a purposeful approach.

We, as a global community, not only need to reduce greenhouse gas emissions to zero. We even immediately need to eliminate gases that are already in the atmosphere. This is not possible if each company or individual only tackles the simple and cheap solutions or even tries to pass the responsibility for their own shortcomings to others by purchasing offsets.

To slow down climate change, it is not sufficient to just burn fossil fuels more efficiently, it is necessary to completely stop using and burning them.

If we get the option to offset, we tend to only improve the internal situation where the costs are higher than for an offset, e.g. by opting for a flight and miss an opportunity to travel by train, powered by green electricity. But, with climate compensation, the maximum reduction of total CO₂-emissions is limited to 50% which is not sufficient to reach climate goals.¹

A good approach would be if all entities would act together and improve the situation regarding their individual, specific key contributors to their global warming potential.

Paying money to other companies or individuals should only be done as a voluntary measure, e.g. by supporting so-called Gold Standard projects that also bring social benefits. In other words, carbon offsets or climate certificates are not suitable as a substitute for one's own actions.

If emissions already happened, it is helpful if former emissions are offset. However, if a decision must be made for future emissions: No climate certificate in the world can undo one emitted ton of CO₂. Independent if you offset it once, twice or as many times as you want.

2.4 LCI data collection

Available information and data (such as electricity, heating and hot water billing) were primarily used to model the core processes.

The data for business trips (transport, overnight stays) was extracted from the expense reports. Information on social insurance is taken from the annual financial statements for the company. Only the employer's contribution to the insurance is considered.

The consumption of coffee, tea and paper was recorded according to receipts and own estimates. The environmental impacts caused by the manufacture of computers and printers have been broken down to the assumed total service life of a device of 8 years.

The ESU database version is used as background data for transports and materials (ESU 2020). Data for the production of coffee, tea and provision of overnight stays are taken from the company's own database (Jungbluth et al. 2020). For purchased services and social security, expenditure data is linked to data from the Swiss environmental-extended input-output table to calculate environmental impacts (Jungbluth et al. 2011). The modelling and evaluation is carried out in the LCA software SimaPro 9.1.

The complete life cycle inventory for the environmental report is shown in Tab. 2.2.

¹ <http://www.esu-services.ch/fileadmin/download/jungbluth-2009-DF37-7.pdf>

For commuting as the only upstream process, the results show relatively low contribution shares too. For all indicators commuting plays a rather minor role.

The process with the lowest contribution to the overall impact for all indicators is disposal. Since consultation is a service and uses low amounts of material goods (compared to production), the disposal of materials has a small share to the overall impacts.

Tab. 2.3 Life cycle impact assessment per hour of ESU-services consulting according to different environmental indicators in 2019

Indicator	Unit	UPSTREAM	Core processes						TOTAL	TOTAL without travel
		Commuting	Energy	Infrastruct. & Materials	Business trips	Social insurance	Services	Disposal		
Acidification	kg SO ₂ eq	2.4E-04	5.7E-04	9.7E-04	1.4E-03	3.2E-03	9.0E-04	2.2E-05	7.2E-03	5.9E-03
Share	%	3%	8%	13%	19%	44%	12%	0%	100%	81%
Eutrophication	kg PO ₄ eq	9.4E-05	7.5E-05	9.2E-04	8.8E-04	1.6E-03	4.6E-04	7.7E-05	4.1E-03	3.2E-03
Share	%	2%	2%	23%	22%	39%	11%	2%	100%	78%
Climate change	kg CO ₂ eq	5.7E-02	3.1E-01	1.6E-01	4.2E-01	7.6E-01	2.0E-01	6.7E-03	1.9E+00	1.5E+00
Share	%	3%	16%	8%	22%	39%	11%	0%	100%	78%
Photochemical oxidant	kg NMVOC	2.6E-04	6.5E-04	7.1E-04	1.5E-03	2.8E-03	7.9E-04	1.4E-05	6.7E-03	5.3E-03
Share	%	4%	10%	11%	22%	42%	12%	0%	100%	78%
Abiotic depletion, elem	kg Sb eq	2.0E-07	1.7E-07	2.6E-05	3.0E-07	6.7E-05	2.2E-05	8.4E-09	1.2E-04	1.2E-04
Share	%	0%	0%	23%	0%	58%	19%	0%	100%	100%
Abiotic depletion, fossil	MJ	6.0E-01	3.9E+00	1.5E+00	4.9E+00	1.2E+01	3.1E+00	2.0E-02	2.6E+01	2.1E+01
Share	%	2%	15%	6%	19%	45%	12%	0%	100%	81%
Ozone layer depletion	kg CFC-11 eq	9.2E-09	5.8E-09	0%	2.2E-08	1.4E-06	3.4E-07	1.9E-10	1.8E-06	1.8E-06
Share	%	1%	0%	0%	1%	79%	19%	0%	100%	99%

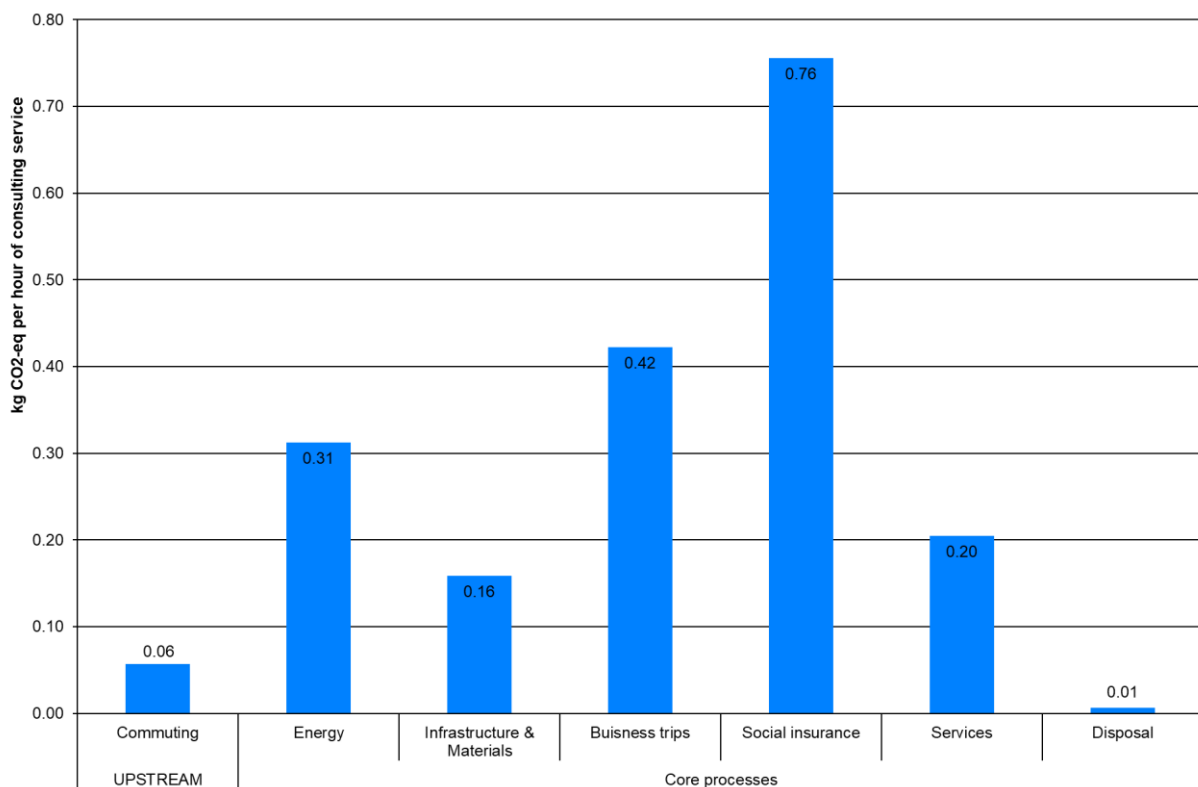


Fig. 2.1 Carbon footprint results in kg CO₂-equivalents per hour of consulting service in 2019

It should be noted that environmental product declarations and reports from different programmes or initiatives cannot be compared with each other or can only be compared to a limited extent.

2.6 Total environmental impacts

For the Swiss customers of our services, information on the environmental impact points (UBP) caused according to the method of ecological scarcity 2013 (Frischknecht et al. 2013) might also be of interest. These impacts are shown in Tab. 2.4 and Fig. 2.2.

The assessment according to environmental impact points comprises several pollutants and resources, which are weighted differently according to the objectives of Swiss environmental policy. The single score environmental impact assessed with the ecological scarcity method reflects the results of most indicators assessed in the EPD method. Here as well, the highest share is caused by the process social insurance. As already seen in chapter 2.4, also for this method, commuting contributes less than business trips due to the same reasons. Again, disposal contributes a minor share to the overall impact.

Tab. 2.4 LCIA with the ecological scarcity method 2013. Eco-points per hour of consulting (Frischknecht et al. 2013) in 2019

Unit	UPSTREAM	Core processes						TOTAL	TOTAL without travel
	Commuting	Energy	Infrastruct. & Materials	Business trips	Social insurance	Services	Disposal		
Ecological scarcity 201UBP	266.36	234.26	416.51	506.76	1281.34	352.48	23.64	3081	2575
Shares	9%	8%	14%	16%	42%	11%	1%	100%	84%

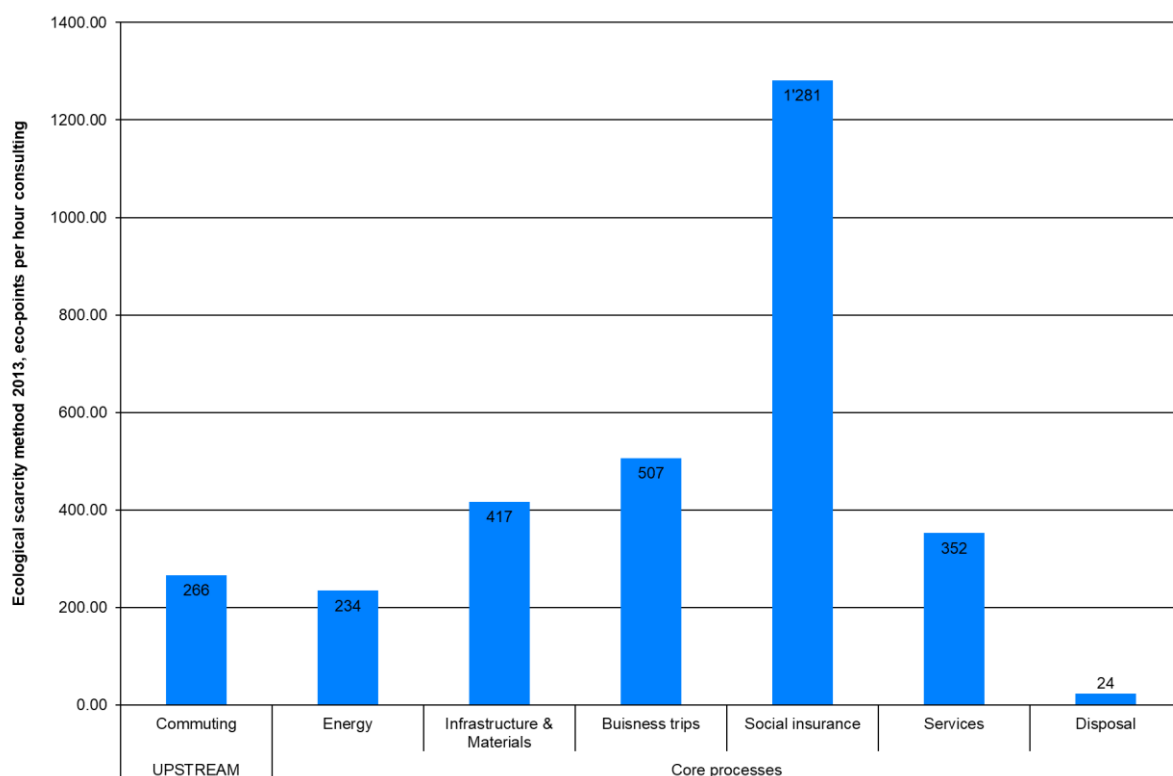


Fig. 2.2 LCIA with the ecological scarcity method 2013. Eco-points per hour of consulting (Frischknecht et al. 2013) in 2019

2.7 Indicator results for use of resources and waste

If the waste treatment is not included within the system boundaries, the EPD standard requires to list indicators for use of resources and waste directly taken from the life cycle inventory. As this LCA includes the whole life cycle of all required products and services, it is not necessary to so.² All the related impacts are assessed.

2.8 Discussion of EPD results

According to the product category rules (PCR 2012) for this type of service, it is possible to neglect materials in the balance sheet if they contribute less than 1% to the total environmental impacts. Practically it seems hardly possible to check this. Our balance sheet also neglects certain material inputs such as ballpoint pens. It was not possible to quantify each consumption of such materials purchased in only insignificant amounts. In some cases, there is also overlap as to which contributions can be better recorded through monetary annual accounts and which materials can be recorded directly.

In the product category rules (PCR 2012) social security and external services such as accounting are not explicitly mentioned. Our balance shows that they account for a quite relevant share of the environmental impacts caused. Therefore, it would be recommended to include them in the EPD of consulting services.

3 Our commitment to sustainability

The environmental reports done for consulting services of ESU-services Ltd. show that the environmental impacts caused per consulting hour can be highly influenced by the number of business trips done by airplane. Air travel depends on the projects carried out and on visits to international congresses. In 2019 we were able to make all trips by train.

For travel by car, there is a membership with the car-sharing provider Mobility, which, however, hardly had to be used. The possibility of online telephone conferences is intensively used to avoid travelling abroad.

Our suppliers are chosen also on basis of their sustainable performance. For example, we use recycling or FSC certified paper. We use the regional offer for naturemade star certified electricity "CleanSolution StarFlex" provided by SH power. The electricity consists of 97.5 % hydropower and 2.5 % new renewable energies.

Other factors such as the level of energy and water consumption and infrastructure can only be influenced to a limited extent.

For pension insurance, ESU-services is a member of the "Abendrot" insurance company, which pursues a sustainable investment policy. Other insurances for the company like AHV administration office are required by law and therefore cannot be influenced. So far it is not possible for us to assess and compare the environmental impact of required accident insurance.

Commuting depends on where employees live and is therefore an individual decision. As far as business concerns do not conflict with this, it is also possible to work at home for single days and thus avoid commuting. For business and private travel, permanent employees are provided with a general subscription for public transport. This creates a strong incentive to use public transport instead of a private motor vehicle for commuting and private travel.

² Updated clarification regarding indicators for use of resources and waste: <https://www.envi-rondec.com/News-archive/#15922>, online 27.07.2020

We offer all staff members to work part time in to support families and work-life balance. Salaries are based on performance and not influenced by age or gender. Additionally, we actively discourage structural overtime.

We actively support our customers for developing sustainable business practice. There are special consultancy rates for NGO's.

ESU-services cooperates closely with the [global SimaPro network](#). With a wide range of expertise available, we can offer unparalleled services and facilitate large international or multi-client projects. Within the partner network we have [developed and expressed our ethical core values](#). Collaborating with partners all over the world is crucial for ESU-services as we work to meet the precise needs of our customers.

An important public discussion in the year 2019 was about “fake news” presented in media. Therefore, we strengthen our commitment to provide all types of media with reliable and transparent information about environmental aspects. The main themes presented were an LCA on pets (Annaheim et al. 2018) and several request concerning sustainable food consumption. Many media took advantage of our services and based their articles partly on contributions by ESU-services. A list of articles can be found here: <http://esu-services.ch/de/publications/media/>.

4 Your partner ESU-services Ltd.

On the following pages we present us as your project partner for projects in the field of life cycle assessment.

4.1 Experienced project team

The work will be carried out by Niels Jungbluth, CEO at ESU-services, and Christoph Meili, environmental scientist at ESU-services. Both are experienced in the field of ecological assessment of life cycles and profit from a network of renown experts in the fields required for the study. Niels Jungbluth will oversee the project lead.

4.1.1 Dr. Niels Jungbluth, chief executive officer (CEO)

Dr. Niels Jungbluth studied environmental engineering at the Technical University of Berlin. He started working with LCA in 1994 and prepared his diploma thesis during a six month stay at the TATA Energy Research Institute in New Delhi, where he elaborated a life cycle assessment for cooking fuels in India. Between 1996 and 2000 he worked on a Ph.D. Project at the Swiss Federal Institute of Technology (ETH) in Zurich at the chair of Natural and Social Science Interface. His Ph.D.



thesis on the environmental consequences of food consumption has been awarded with the Greenhirn Price 2000 by the German Öko-Institut. In this thesis he investigated food consumption patterns by means of life cycle assessment.

He started working with ESU-service in 2000. Since 2006 he acts as a managing director. Since 2000 he worked on more than 200 consultancy projects in the working areas food, biomass, energy systems, input-output-analysis, sustainable consumption, and several other themes. He is responsible for the SimaPro centre and the data-on-demand service of ESU. Dr. Niels Jungbluth is in the editorial board of the “Int. Journal of LCA” and works as reviewer for several other scientific journals. He worked as a special expert for several organizations as e.g. Deutsche Bundesstiftung Umwelt, CEN TC 383 standard (GHG accounting on biofuels), UNEP-SETAC life cycle initiative, Swiss law on tax exemption for biofuels.

4.1.2 Christoph Meili, project manager

M.Sc. ETH in Environmental Engineering

Christoph Meili studied environmental engineering at ETH Zurich with major in ecological system design, Air Quality Control and Waste Management, and in Soil Protection. In his master thesis he did a material flow analysis and LCA for hydrothermal gasification of biomass.



Christoph Meili works as project manager for ESU-services since 2016. Here he is responsible for software sales and support in the Regional SimaPro Centre for Switzerland, Germany, Austria, and Liechtenstein. Since starting at ESU he conducted several LCA projects on extraction of energy carriers, local energy systems, several different electronic devices, packaging materials and food recipes. Furthermore, he evaluated the quality of cotton labels and developed characteristic value models for run-of-river power plants, lifestyle analyses, transport routes and raw material extraction. He leads software training courses as well as introductory courses and lectures on various life cycle assessment topics.

Since 2012 he has also been working part-time for WWF Switzerland. In the Markets department, he is responsible for the Footprint Calculator, environmental tips for everyday life, as well as scientific work and external enquiries on consumer issues.

4.1.3 Maresa Bussa, project manager

M.Sc. in Energy and Environmental Engineering

[Maresa Bussa](#) studied energy and environmental engineering at École des Mines de Nantes and the Technical University of Madrid. In her master thesis, she analysed options to adapt to climate change on the Koh Rong Archipelago in Cambodia.

Between 2017 and 2020 she worked for the Weihenstephan-Triesdorf University of Applied Sciences as a research associate in an EU project on the utilisation of cyanobacteria. She was responsible for the environmental and economic assessment of the developed product system. Since 2018, she is a doctoral candidate at the Technical University of Munich. As part of her doctorate, she conducted life cycle assessments on different microalgae cultivation systems and extraction methods. Maresa Bussa started working for ESU-services in 2020. In her first projects she is investigating alternatives to cow's milk as a drink and is leading the life cycle assessment work in the European PROFUTURE project on algae.



4.1.4 Martin Ulrich, trainee

M.Sc. ETH in Environmental Engineering

Martin Ulrich studied environmental engineering at ETH Zurich with major in ecological system design about resources management. In his master thesis he evaluated the relation between cost and environmental impact of products and services throughout the broad spectrum of consumption in Switzerland.

In addition to his internship, Martin works as the team leader of a bicycle courier team of the Familie Wiesner Gastronomie AG.



4.2 Global Partner Network

ESU-services cooperates closely with partners in the global SimaPro network.³ With a wide range of expertise available, we can offer you unparalleled services and facilitate large international or multi-client projects. We can easily contact these partners to get access to data or information in all regions of the world. Collaborating with partners all over the world is crucial for ESU-services as we work to meet your precise needs. Furthermore, we share the following ethical values and commitments⁴ with this network.



Science-based sustainable solutions are for everybody:

- We love our planet, it's our home.
- We work to restore its resilience through sustainable practices and metrics.
- LCA is at the heart of sustainability metrics and must be accessible for everybody.
- SimaPro and LCA-based practices will be pivotal in a vibrant ecosystem that connects a diversity of worlds, systems, people.
- Within that ecosystem we will co-create solutions together with clients, partners, fellow companies, and each other.

Our commitments:

- We commit to quality, accuracy, and transparency.
- We commit to the fact-based results. We won't engage in facts-distortion.
- We use our experience and knowledge to inform our customers and to facilitate sustainable development and practices (co-create better solutions).
- We take every opportunity to maximise our positive impact.
- We welcome everybody to embrace a sustainable transition and see them as a collaborator.

³ <http://esu-services.ch/network-customers/partner/>

⁴ Download on <http://esu-services.ch/address/tender/>

4.3 More than 25 years of experience

Niels Jungbluth has started working on LCA in 1994. ESU-services provides consultancy in the field since 1998. See Tab. 4.1 for a list of the most recent and relevant projects conducted over the last years. A full list with more than 300 project references can be found on our website: www.esu-services.ch/projects/fulllist/.

Tab. 4.1 Selection of recent and relevant projects done by ESU-services in 2019

Year	Project title	Commissioned by
2019-2023	PROFUTURE: Microalgae Protein-Rich Ingredients for the Food And Feed of the Future	Horizon 2020
2019	Calculation tool for comparing different scenarios for the purchase of Christmas trees	SRF Kassensturz
2019	Feedback consumer councillor to the topic grey energy	Schweizerische Energie-Stiftung SES
2019	Life cycle assessment for avocados: Comparison with other products used as sandwich topping	Satori S.A
2019	Eco profile for primary packages	Neoperl
2019	Updating of oil and gas life cycle inventories for reference year 2018	Plastics Europe
2019	Expert opinion on the environmental impact of the district heating planned for the city of Wil	Technische Betriebe Wil
2015-2019	Expert for short consultancy on environmental improvements	Reffnet
2019	Verification: EPD of the Stadler double-decker train KISS	Stadler Bussnang AG
2019	Organisation of DF72: Normalization and weighting: The forgotten theme in LCA	Swiss discussion forum on LCA
2019	Compilation of literature data on the environmental impact of alternative propulsion systems and fuels	Federal Office for the Environment (FOEN)
2019	Critical Review: Comparative carbon footprint of transport services	Denkstatt, AT
2019	Brush-Up of life cycle inventories for oil and gas production for inventory data focus Switzerland (IFS)	Federal Office for the Environment (FOEN)
2019	Verification: EPD of a thin film solar cell	Miljögraff & MälarEnergi
2019	Verification: EPD of a glass-glass PV module	Fachhochschule Nordwestschweiz
2019	Critical Review: LCA of meat trays made from different materials	Fraunhofer-Institut für Umwelt-, Sicherheits- und Energietechnik, DE
2019	Verification: EPD model for lightweight concrete drainage channels	BG-Graspointer GmbH & Co KG, AT
2019	LCA on chemical products	DuPont
2019	Life cycle assessment of different storage types and sites for a deep geological repository for radioactive waste in Switzerland	Nagra (National Cooperative for the Disposal of Radioactive Waste)
2019	Lessons learned from assessing life cycle impacts for an environmental product declaration: Examples for run-of-river power plant	Sustainable built environment conference
2019	Updated Eco-profile of Composites Core Materials	Airex AG, 3A Composites Core Materials
2019	Generic LCI models for crude oil and natural gas extraction, transportation and refineries	CDLCI Coöperatie U.A.
2019	Comparison of environmental impacts of mineral and natural cat litter	Verbande der Betriebsleiter und Betreiber Schweizerischer Abfallbehandlungsanlagen (VBSA)
2019	Evaluation of the Bioeconomic Research Programme Baden-Württemberg	Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg

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