

Transnational Learning Document #2

Life cycle
methods for
resource-
efficiency

June 2020

Improved Environmental and
Resource Efficiency through use of
Life Cycle Instruments for
implementation of regional policies
of the European Union

LCA4Regions
Interreg Europe



European Union
European Regional
Development Fund



There are many ways of planning for **regional development**.

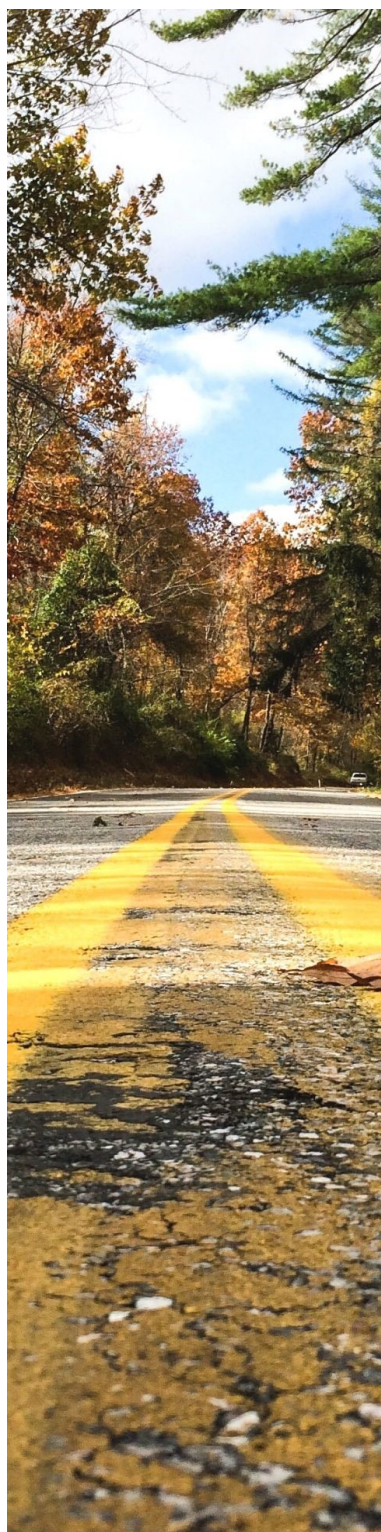
Traditional methods of '*one issue at a time*' have produced some useful immediate results but have also sometimes had unfortunate side effects, as for example when infrastructure is planned without an 'end of life' component built in.



Life Cycle process

A more systematic way of thinking, taking into account the **entire life cycle of projects and products leads to more effective programmes**, and fewer unwanted secondary impacts. Citizens as well as organisations are increasingly interested in the « **world behind the product** », something that life cycle methodologies based on key SDGs can reveal. Life cycle thinking is also the basis for the LCA4Regions project where learning life cycle methods from each other improves everyone's development policies and action plans.

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Purpose of the document

The document belongs to the series of TLJ Learning Documents which aim to provide an overview of the activities carried out during the Transnational Learning Journeys. It summarizes the practices discovered during the TLJ, the discussions held, the lessons learnt, and elaborate some inputs to be further explored by the project. It proposes some elements to be considered for improving the quality and effectiveness of the next TLJ.

The present document is focused on the second Transnational Learning Journey that took place in June 2020 online (although originally planned to take place in Navarre).

What is a Transnational Learning Journey?

Transnational Learning Journeys (TLJ) represent the core of LCA4Regions, an opportunity for dialogue on a key aspect of the project.

Organised every six months by a different partner region, TLJs include thematic workshops, site visits and peer reviews and focus on one of the project's thematic pillars. **They bring together partners and stakeholders to share challenges, opportunities and good practices** to improve their regional policy instruments.

Seven TLJs will be organised during the first phase of the project, the "Interregional Learning". The first one took place in Kaunas (LT) in January 2020, tackling the implementation of LC (Life Cycle) methodologies in environmental and resource efficiency policies and focusing on tools to apply LC into practice. The upcoming TLJ will be in Satakunta (FI) on LCA in waste and material flows. The following meetings will be in Western Slovenia (SI), Lodskie Region (PL) Lombardy (IT), and Baixo Alentejo (PT).

Transnational Learning Journey #2

16-17-18 June 2020, online/Navarre (Spain)

OVERVIEW

The second **LCA4Regions Transnational Learning Journey (TLJ)** was originally foreseen to take place in the region of **Navarre** (Spain), lead partner of the project. However, the global situation with several restrictions linked to the COVID-19 safety measures forbid any physical event to be organised. Thus, the TLJ#2 took place on **16, 17, and 18 June** online, was entirely live-streamed on [Twitter](#), organised by and focused on Navarre. The event tackled the topic of **life cycle methods for resource-efficiency**, one of LCA4Regions six pillars.

The first day offered participants an overview of the project and the LCA concept. They had the chance to grasp Navarre's policy context and to see **opportunities and challenges of LCA4Regions** emerged from the regional analysis benchmark. It was followed by a intervention of Ramy Salemdeeb, environmental analyst **expert on LCA** from [Zero Waste Scotland](#) involved together with the LCA4Regions partner [ACR+](#) in the [“More circularity, less carbon”](#) campaign. He explained how public authorities can work to reduce carbon impacts. The day concluded on a strategic remark: integrating life cycle thinking into regional decision-making becomes even more essential in this period of crisis, when many certainties have fallen apart and a stronger need for change emerged.

On the second day, partners presented **LCA good practices** on resource efficiency from the seven partner regions and took inspiration from each other for future regional action plans. Participants got a glimpse of comparative LCA for Steel

Plate Priming in Lithuania, recycled soil material in Finland - presented by Ramboll - the Slovenian good practice on energy and resource efficiency in hotel industry, LCA of building components - explained by IZODOM, the awards 'more Alqueva, more value' in Portugal, LEED Protocol introduced by Lombardy region (Italy), and MCP carbon footprint calculation in Navarre.

Finally, during the last day, partners and stakeholders took part in **virtual study visits in Navarre** and discovered [AGRALCO](#), which transforms and valorises winemaking by-products, and [BIOSASUN](#), which uses olive trees to make quality products.

The journey wound up with a dynamic and enriching **round table for peer-to-peer review of the ambitious Navarre policy context**: its Circular Economy Agenda, Waste Plan, Regional Law on Waste and its Taxation, Public Contracts Law, and Climate change roadmap. The result was an insightful discussion between partners and external experts based on the adequacy of policy instruments to enhance resource-efficiency, the extent of LCA application, and the replicability opportunities for other regions.



AGENDA

DAY 1 – LCA4Regions project

Tuesday 16 June
(11:00 – 12:30)

Presentation of partners' regional analysis on life cycle approaches and of their benchmarking which highlights the transferability opportunities between the 7 regions.

11:00 - Welcome Gov Navarre

11:10 - LCA4Regions project

11:15 - LCA concept

11:25 - Navarre overview and policy context

11:35 - Regional analysis & Benchmarking

11:45 - Q&A

11:55 - LCA for resource efficiency – “More circularity, Less Carbon” campaign or how can public authorities reduce their carbon impact

12:15 - Q&A

DAY 2 – LCA good practices on resource efficiency

Wednesday 17 June
(09:00 – 10:30)

Presentation of good practices from partners regions which include the use of life cycle tools or methods on resource efficiency and provide potential learning and inspiration for all regions to define improvement areas that can be integrated into their policies and procedures through their future action plans.

09:00 - LCA good practices on resource efficiency (Part 1)

09:35 - Q&A

09:45 - LCA good practices on resource efficiency (Part 2)

10:15 - Q&A

10:25 - Choose your favourite GP!



DAY 3 – Study visits and peer review

Thursday 18 June
(09:00 – 11:00)

Two companies will explain how they work on resource efficiency, their experience to contribute on policy changes and how the use of LCA has helped them on decision making. One transforms and valorizes winemaking by-products and the other one uses olive trees to make quality products.

09:00 - Study visit to Agralco S. Coop.

09:25 - Q&A

09:35 - Study visit to Biosasun S.A.

09:55 - Q&A

10:05 Peer review – open discussion

NAVARRRE



Country: Spain

Capital City of the Region: Pamplona

Population: approx. 650.000 inhabitants

Policy instrument priority axis: Energy efficiency, smart energy management and the use of renewable energy in public infrastructures, including public buildings.

Economy: Services, industry (automotive, agroindustry, electronic products, energetic, renewable energy...), construction.

Expectations: Expand the use of life cycle methods in private and public sector through the implementation of public policies. These actions will help to fight against climate change, improve environment protection, use resources more efficiently and lead Navarra to a greener and sustainable economy.

Promising pillars: Public procurement, Waste and Material Flow and Resource efficiency

To improve: Public procurement, Training and capacity building and Monitoring and evaluation.

Focus for improvement: Coordination between public departments and support for life cycle thinking

LC experience: Carbon footprint, waste prevention, circular economy.

The Government of Navarre



The Government of Navarre is a regional public authority. The Department of Rural Development and Environment is in charge to lead LCA4Regions project, through the team of Circular Economy and Climate Change Service. This Service exercises the following competencies:

- Planning and promoting the Circular Economy through:
 - The control and prevention of pollution and waste;
 - The management of authorizations and control of activities with environmental impact;
- The Strategy against Climate Change, including mitigation and adaptation actions;
- Environmental Quality of the hydric, atmospheric, and terrestrial means through planning, monitoring, control, and, where appropriate, adequate repair actions.



AIN



AIN is a private association that, through its specialized knowledge in management and technology, fosters collaboration and improves the competitive position of the industry and the environment. The Industrial Development Unit of AIN participates as a partner in the LCA4Regions project, sharing its knowledge and experience in LCA, and supporting the Government of Navarre to manage the project.

The expertise of this Unit is devoted to:

- Advance engineering solutions for industrial construction, efficient use of energy and environmental protection;
- Unconventional systems for sensing, control, and communications with activities in advance predictive maintenance techniques;
- Advanced data processing techniques.



Navarre and AIN's team behind LCA4Regions

Raúl Salanueva (Government of Navarre) – Head of the Waste Unit in the Government of Navarre and Chemist by profession is an expert and policymaker on waste management and circular economy with seventeen years of experience.

Delia Sola (Government of Navarre) – Responsible for European Projects of the Rural Development and Environmental Department. Agricultural Engineer by profession has 10 years of experience in a number of EU projects including H2020, LIFE, POCTEFA, or Interreg Europe.

David Sotillo (Government of Navarre) – Responsible for environmental control and quality of industrial activities and waste management in Navarre. Bachelor and Master in Industrial Engineering, has fifteen years experience in pollution control and resource consumption in industrial and waste management activities.

Sandra Elía (Government of Navarre) – LCA4Regions project coordinator, Environmental Scientist and Technical Agricultural Engineer with ten years of experience in environmental monitoring, organic farming and management and control of the Common Agricultural Policy.

Irene Eslava (AIN) – Project manager on environment and sustainability projects in the Industrial Development Unit in AIN. Industrial Engineer and Project Manager Professional, with more than twenty years of experience in the execution and management of environmental and sustainability, and industrial safety projects.

Nancy Tarjenian (AIN) – Head of the industrial transformation cluster AIN. Degree in Economic and Business Sciences. European project expert on innovation, digitization, resource efficiency, sectoral development, Smart Specialization Strategy (RIS3), and internationalization.

José Luis Zabaleta (AIN) – Project manager on environment and sustainability projects in the Industrial Development Unit in AIN. Bachelor in Chemistry and Project Manager Professional has twenty-five years of experience in the execution and management of environmental and sustainability projects.

José Maria Sotro (AIN) – Industrial Engineer in the Industrial Development Unit in AIN, with more than twenty-five years of experience in energy, environmental, and industrial facilities projects.

REGIONAL ANALYSIS AND THEIR BENCHMARK



During the second semester, each project partner delivered a synthetic analysis to communicate the **state of the art of local policy making process**, presenting local and regional (and national if relevant) context analysis, including deficit and expectations in policy making process, resources exploitation, or investments.

Each region identified the elements for a SWOT analysis, reported the **local view of LCA4REGIONS issues**, and analysed its policy to identify to what extent it encompasses LCA. They included the analysis of their **actual experience on the use of LCA** and the evaluation of the supporting environment for LCA studies in the region.

ACR+ carried out a benchmark of these analyses to **set a common baseline** about the life cycle approaches existing within the project, highlighting **opportunities and challenges** for achieving the project goals, and to allow the partners to proactively pursue them. By grouping and cross-referencing 7 SWOTs elements of the 7 regions LCA4Regions elaborated an analysis of commonalities in terms of strengths, weaknesses, opportunities, and threats. The conclusions of the analyses led to a **final project SWOT analysis that encompasses the most relevant points highlighted by several regions**. The cross-analysis of data led to additional criteria that may **stimulate the transfer opportunities for good practices**.

Between the strengths identified there is a wide range of natural resources and key industrial sectors that could play a

role in resource efficiency plans. There is room for strategies in the public procurement pillar and a quite developed LC methodologies theory as well as high interest in LCA.

The **availability of data** seems to be a general issue: when present they are not comprehensive. There is a need for clearer and **unified methodologies**, that could help to get structured and comparable information and LC application.

In general, there is an **absence of a regulatory framework** that foresees the application of LC methods.

Despite the high availability of theory on LC at academic and research level, the regions noticed very **low awareness in companies and administrations**, and especially a **lack of technical specialization on LCA**.

LC methods in the regions are sometimes **very specific and limited** to the assessment of a particular procedure, rather than applied to the whole process. Another element which emerged as a weakness is the **absence of long-term criteria** for the development of decision making. An issue underlined by several regions is the **slowness of the bureaucratic processes**.

More cooperation of academics and the industrial sector in strategic specific partnerships could drive the change and encourage companies to invest, as well the creation of databases.

Seeing the low awareness about the benefits and the different applications of LC, making decision-makers, institutions, and organizations **aware of the LC potential** is crucial. The **mobilization of local authorities** via existing local channels is fundamental to get successful practical outcomes. Overcoming **production inertia** is a huge threat that a lot of regions remarked. The most significant threat on which all regions agree is the **high cost of LC tools**.



[Report summarizing the main results](#)

[Full presentation](#)

[Video](#) (47.20)



GOOD PRACTICES ON RESOURCE EFFICIENCY

An important part of the first phase of the project is to identify Good Practices, that is concrete examples that give proven successful tangible results, and have a potential for learning. Presented by partners during each TLJ, they will serve as an inspiration to prepare the Action Plans.

A close attention was given to the variety of the Good Practices presented so the overall selection presents a balance of different applications of LCA. However, this was not easy and the majority of the Good Practices are related to its application in buildings and the construction sector. It was also important for the Good Practices to clearly be linked to public policy on resource efficiency, that is indicating how the LCA promote good policy, and how current policy require or promote the use of LCA.

Comparative life cycle assessment of water-based and solvent-based primer paints for steel plate priming | Kaunas University of Technology (Lithuania)

January 2016 – May 2016

Analysis carried out by Institute of Environmental Engineering of the Technological University of Kaunas.

Volatile Organic Compounds (VOCs) are still used and released in steel plate primer processes and have negative environmental damage. In this good practice, life cycle assessment (LCA) is used to justify the substitution of products in a metallurgical company due to regulatory concerns. A coating system (primer, liquid, and diluent) was addressed to reduce the amount of VOC emissions



(compliance with IED and Diffuse Emission Limit Values) and occupational exposure to hazardous VOCs. The results indicated that the replacement of the water-based primer paint was beneficial in all categories of environmental impact. All impact categories, a decrease of more than 34% in environmental impact. The largest decrease, more than 50%, is found in ozone depletion, freshwater eutrophication, human toxicity, particle formation, ionizing radiation, and metal depletion. The environmental impact for fossil depletion was almost the same, only slightly negative. The only substantial negative change (by 44%) was in the impact category of agricultural land occupation. A surprising result of the results is that the water-based product contributes less to the depletion of water resources when they take into account the life cycles of the products (eg 1-butanol production, zinc production, xylene production, propylene).

Environmental impact assessment of renovated multi-apartment building using LCA | Kaunas University of Technology (Lithuania)

January 2018 – May 2018

Analysis carried out by Institute of Environmental Engineering of the Technological University of Kaunas.

Lithuanian multi-apartment buildings are studied for environmental impact assessment using the life cycle approach, as these buildings were built during the Soviet era, where energy consumption was much higher than in the average EU member states. In recent times, old buildings were overhauled by government agencies through the modernization process. However, the renovation process and the materials used during the process required to speculate on its sustainability. Therefore, the renovated buildings in the city of Kaunas were assessed for environmental impact using the Life Cycle Assessment. The materials used and the impact were studied, and the study has determined that the renovation measures could reduce the impact on climate change from 12% to 48%, affected by the type of renovation carried out. It is also evident from LCA evaluated results that the greatest impact was due to the supply of thermal energy in non-renovated buildings. Later, losses have been reduced by installing renewable energy measures. Furthermore, in a renovated apartment building, the potential savings in controlled thermal energy for space heating and domestic hot water preparation is 25%, 40% after a conventional renovation (Building A) and a renovation with renewable measures (Building B), respectively. Furthermore, the selection of construction material during renovation could reduce the environmental burden associated with it.

LCA in reducing CO2 emissions in the production of building components - IZODOM company | Lodzkie Region (Poland)

*October 2013 – March 2014: LCA analysis preparation
Since 2014 (ongoing): production of low-emission passive house construction system*

IZODOM is a producer of materials for housing construction. The company offers a complete system of elements for the construction of passive and energy-saving houses, from foundations, walls and roofs. The company commissioned an LCA analysis for its products. The study aimed to determine and compare the carbon footprint of buildings constructed with traditional technologies and Izodom in the stage of production, transportation, construction and use of materials. LCA analysis was performed according to ISO 14040; PN EN ISO 10211: 2008 and PN-EN ISO 10456: 2009. The study modified lower house emissions in Izodom technology by up to 56%. Proper building insulation guarantees lower energy costs and lower CO2 emissions during the decades of building use. The analysis also specified the need to replace the machine park with a more energy efficient one and provide non-coal energy sources. A significant negative impact of transport on the carbon footprint has also been observed. The raw materials used by IZODOM for the production of elements are 100% recyclable. The raw materials used by the company are approved for the production of food packaging.

The recommendations resulting from the LCA analysis indicate that the most appropriate methodology for the construction industry would be cradle-to-cradle.

Development of environmental product declaration using LCA analysis for thermal insulation systems in the construction industry – ATLAS | Lodzkie Region (Poland)

March 2014 – ongoing

ATLAS is currently the largest producer of construction chemistry products in Poland and one of the first Polish companies which decided to assess the environmental impacts using the LCA method. The company has obtained a type III environmental declaration (EPD) based on LCA for the ATLAS ETICS thermal insulation system designed for insulating external walls of buildings using polystyrene. The reason for this was the changing awareness of environmental issues in the company and the will to meet the future demands of EU concerning European commercial market. The Environmental Product Declaration was developed for the first time in 2014 and renewed in 2019. In the process of obtaining EPD used LCA framework: ISO 14044: 2006 (Environmental management - Life cycle assessment - Requirements and guidelines) and ISO 14025: 2006; ISO 21930:2017; EN 15804: 2012; PN-EN15942: 2012 and many others. The calculations were carried out for the "cradle to gate" approach, covering the supply of raw materials, transport and production of materials. The EPD was issued by the Building Research Institute in Warsaw, which performed the LCA analysis based on data provided by Atlas. The analysis includes parameters defining basic environmental impacts, parameters describing resource consumption and amount



of waste. The whole process lasted 9 months (including data collection 6 months). The beneficiary of this practice is Atlas and its customers in the country.

Data was collected for 6 months. Then the Institute, which issued EPD, needed two months to carry out the calculations. One of the effects of using EPD at Atlas in 2014 – 2019 was a change in the global warming potential. In the case of 40,000,000 m² of insulation (“cradle to gate” approach), the changes in 2014 – 2019 give values of reducing CO₂ emissions to the atmosphere by 128,000 tonnes. In addition, many production efficiency and resource efficiency indicators improved (such as weight of hazardous waste removed, weight of radioactive waste removed, mass of materials for recycling, total consumption of renewable and non-renewable primary energy resources and others).

Mais alqueva, mais valor awards | CIMBAL (Portugal)

2019

These awards aim to recognize projects that implement a set of good practices related to the efficient use of water, soil, biodiversity conservation, promotion and dissemination of their business models, integrating the latest concepts of sustainable development.

In 2019 – first edition, "More Alqueva, More Value" Awards aimed to identify and give visibility to companies, people, and institutions that contribute to the efficient use of natural resources, with a special focus on water. The aim is also to create a collaborative network of farmers who can demonstrate good practices and promote the dissemination of these concepts that reconcile environment and agriculture, creating added value for the producers who implement them, in the medium and long term.

URSA – Unidades de recirculação de subprodutos de alqueva | CIMBAL (Portugal)

2017 - 2019

The promotion of soil fertility and the efficient use of irrigation water are basic principles of EDIA in the context of the environmentally sustainable management of Alqueva irrigation. The valorisation of organic by-products from agriculture and their return to the soil presents itself as the strongest and longest lasting possibility to recover soil quality, protect water and promote the efficient use of resources.

The URSA Project – Alqueva By-Products Recirculation Units, a constellation of units at the service of the irrigation territory, which produce an organic fertilizer by composting, returned to farmers by exchange with the agricultural by-products delivered, for crop fertilization, contributing to the increase of soil fertility and its rehabilitation as a filtering barrier, which promotes downstream water quality and long-term sustainability of irrigation.



The URSA project responds to the problem of low organic matter content in soils, which translates into a reduction in fertility and capacity to retain water and nutrients. This objective is achieved by incorporating organic matter into the soil in a systematic way, a methodology compatible with irrigation, modern and intensive agriculture. For each ton of by-products that the URSA project valorises, 100kg of mineral fertilizers (10 kg of nitrogen), 100 m³ of natural gas, 28.670 litres of water and 750 kg of CO₂ will be saved. A further 100 kg of olives or 200 kg of maize will also be produced.

This solution relies on close collaboration with farmers, since the delivery of organic by-products for composting is dependent on their participation in the project. So, this engagement was crucial throughout the process.

FECA - Fórum da Economia Circular do Alentejo (Alentejo Circular Economy Forum) | CIMBAL (Portugal)

November 2018 - ongoing

FECA has the objective of reflect, share, discuss and outline the main CE intervention pillars in Alentejo region, to contribute to the promotion and to encourage the transition to CE.

Aiming to support the transition of the region to the CE objectives, CCDRA implemented FECA, constituting itself as a model of governance in the region. Through regular and systematic interactions among different entities, FECA is a space of coordination, but above all, is a space where the different stakeholders and CCDRA exchange knowledge, contacts, experiences, projects and identify opportunities or constraints for the application of CE concepts. Strategic Council was formed, coordinated by CCDRA, that integrates 1 university, 1 polytechnic institute, 1 inter-municipal community, a public company, a business association and the ISQ institution. The Strategic Council meets, on average, three times a year and its main action is to discuss and approve the region's CE Regional Agenda. Each year all entities that integrate FECA define the next year's strategic agenda.

Energy and resource efficiency in hotel industry | National Institute of Chemistry (Slovenia)

2009

Resort in Bohinj glacial valley and rural region, on the brink of Triglav National Park taking. The LCA methodologies used were life cycle sustainability assessment and life-cycle thinking. 1st Ecological Hotel built in 2009, involving European Union funding, implemented most efficient, best available technologies possible

MPM is an engineering company which specializes in energy-efficient construction. They built an energy efficient Hotel from scratch, using top technologies available, even implementing some



pilot systems (which require constant surveillance, adaptation, improvement, monitoring). It set an example in sustainable management overall (preferring local food suppliers, recycling and separating waste, promoting cultural and historical heritage, launching sustainable incentives and events for seminar groups, etc.).

When a guest sleeps in Bohinj park ECO Hotel, over 10 times less CO₂ emissions emerges (according to Slovenian Tourism Board calculation). As a consistent benchmark Bohinj Park ECO Hotel also received Green Globe Certificate, which requires the venue to improve on all areas (water management, energy efficiency, waste management, social responsibility, environmentally friendly practices) up to 5 % each year.

Since it was built in 2009, the ecological building has been proclaimed as the most frequently awarded Hotel by national and international institutions. New horizons brought the opportunity to expand the ECO Hotel and create the biggest Slovenian ecological ski retreat. The new projects, which apart from 47 km of ski slopes area include the renovation of a war bunker into a 85 % energetically self-sufficient mountain restaurant, are bound to be finished within the upcoming years.

Energy and resource efficiency in sustainable tourism | National Institute of Chemistry (Slovenia)

2001 - ongoing

The Turizem Ljubljana Public Institute succeeded to introduce sustainable development of the whole destination – city of Ljubljana by obtaining waste reduction, lowering environmental pollution and emissions with various projects and activities aimed at improving the city's environment, to increase the number of tourists and, importantly, to obtain worldwide recognition of the green destination. The life-cycle methodologies used have been life-cycle sustainability assessment and life-cycle thinking.

The strategy consists of various projects and activities aimed at improving the city's environment, such as sustainable development strategy, sustainable urban planning, preserving green areas and potable water sources, waste management, raising environmental awareness among citizens, improving network of public transport and so on.

Concrete facts: 74 per cent of housing in Ljubljana already heated by district heating and natural gas distribution, natural drinking water without prior treatment (expanding the network of drinking fountains), first public orchard, fleet of electric vehicles, 63 % of separated waste collected and the first capital in the EU in the 'zerowaste' programme.

Ljubljana is the first destination in Slovenia with the title Slovenia Green Destination. The certificate of the highest, golden category was awarded by the Slovenian Tourist Board within the framework of the Green Scheme of Slovenian Tourism. Ljubljana has been awarded many times during the



last years: Tourism For Tomorrow 2015, European Green Capital 2016, FIJET Golden Apple Award 2016, Global Top 100 Sustainable Destinations - 2014, 2016, 2017, WTM Responsible Tourism Award 2017.

Resource efficient land use to promote sustainable land design and development | Pyhäjärvi Institute (Finland)

2018-2019

Sustainable land use was applied with LCA to convert dredge spoil and other residual land materials and sanding into novel materials. Since 2015, Finland started to develop an initiative for sustainable land design (so called KESY model). This initiative lists several goals to improve and maintain sustainable environment operations and land use design, with examples as reconditioning work of Ankkapuisto Park in 2016, in city of Vantaa. All analyses were based on CEN/TC 350 standard for sustainability for construction works. This standard defines rules for the development of scenarios, includes the rules for calculating the Life Cycle Inventory and the Life Cycle Impact Assessment (based on ISO 14040:2006) underlying the EPD (for calculation of emissions), including the specification of the data quality to be applied.. The objective of the LCA study was to clarify what kind of effects the use of re-used soils and rocks may have. LCA study indicated that the utilisation of residual lands and materials as replacement of virgin materials resulted in 23000 kg cut of CO₂ emissions and 56000 € savings of virgin material costs. In addition to measurable data, additional environment and health benefits due to reduced mining and land borrow areas could be noted. Greater understanding of the benefits of soil waste re-use can occur by sharing more widely the results of the potential of emissions cuts, and cost efficiency. Current life cycle procedures under ISO 14 040 and as encapsulated in the CEN/TC 350 standard for sustainability for construction works are mature methodologies that are easily available to public authorities.

LCA for evaluation of construction works | Pyhäjärvi Institute (Finland)

2018 - ongoing

Multi-storied buildings were constructed by concrete or wood materials. LCA and LCC were used to obtain comparable data for the time span of 100 years.

City of Helsinki implements the carbon footprint roadmap for Finnish construction industry as an approach to become carbon neutral city by 2035 (Carbon neutral Helsinki 2035 Action Plan). Kuninkaantammi area is a new residential area for 5 500 inhabitants. LCA and LCC exercise were conducted to obtain high quality and comparable data, with similar energy efficiency criteria but with different construction materials. Time was set for 100 years. LCA started from design, and



data is continuously collected. Demolition phase was also evaluated. Potential re-use of demolition materials was also evaluated.

The Housing Finance and Development Centre of Finland (ARA) assigned Bionova Ltd to make calculations.

Wood-based building showed about 20 % less emissions, when materials were assessed. When total emissions for 100 years were compared, wood-based building produced 6% lower emissions. This is due to lower energy efficiency of the building. Energy use is the main contributor of emissions in constructions.

LC calculation tool development is essential to evaluate GHG emissions.

Annually carbon footprint calculation of services provided by Commonwealth of the Region of Pamplona (MCP/SCPSA), reduction and compensation of GHG | Government of Navarre & AIN (Spain)

2014 - ongoing

Since 2014, MCP/SCPSA annually performs a complete analysis of all its facilities and provided services in order to calculate the volume of greenhouse gas emissions generated each year by the provision of its services: Integral Water Cycle, Collection and Treatment of Urban Waste and Regional Urban Transport.

The most relevant target is to be CARBON NEUTRAL IN 2030. Economic savings derived from the energy improvement is also relevant.

This practice has resulted in the reduction of its emissions by 20.7% between 2014 and 2018, with the objective of being carbon neutral in 2030. The MCP compensates its Carbon Footprint by purchasing emission rights. These rights are acquired in certified reforestation projects.

The biggest difficulty has been doing something completely new for the first time. The collaboration with an external expert company to carry out the project has been a good approach. The difficulty in obtaining the necessary carbon footprint data and calculations has been resolved by the external company with the collaboration of technical employees of the MCP.

EFIDISTRICT | Government of Navarre & AIN (Spain)

2014 - ongoing

The project started in 2014 and consists of three main actions: integral energetic rehabilitation of the buildings, renovation and improvement of the existing heating distribution networks and creation of a new District Heating with biomass, including a new heat plant and a distribution



network. Currently, the new heat plant is being developed to supply the heating and hot water networks of 4.000 homes and 8 public buildings in two phases. This neighborhood was built between the 50s to the 70s, with buildings of basic construction and uninsulated envelope (prior to NBE-CT79) and high energy losses through facades and roofs.

From the LCA perspective, the carbon footprint (for the use of fuel) was calculated in the feasibility study for the planned heat central, under two assumptions: current situation with supply of natural gas and future situation with the new heat central and supply of 90% of biomass and 10% of natural gas. The carbon footprint calculation was carried out according ISO 14067.

EFIDISTRIC has mobilized a total investment of 13.5 M€. 3.5 M€ from the Government of Navarra, 0.5 M€ from the Intelligent Energy program of the EU, and the rest contributed by neighbours. The project has created or maintained at least 184 jobs. At present, work continues and employs two people.

EFIDISTRIC has led to energy savings of 3.186 MWh / year, which means avoided emissions of 273 t CO₂ / year. The implementation of the new biomass heat plant will mean a reduction of more than 80% in CO₂ emissions compared to current installations according to the results obtained by carrying out its carbon footprint calculation during the execution of the feasibility study in 2018.

This experience was included in 2018 in the Good Practices manual “A way to make Europe” (IDAE). The EFIDISTRIC project was awarded the first prize in 2019 for the best project financed with ERDF funds at the national level.

LEED Protocol | Lombardy Region (Italy)

June 2020 - December 2020

LEED is a green building certification program used worldwide that includes a set of rating systems for the design, construction, operation, and maintenance of buildings, homes, and neighbourhoods. Residential and tertiary sectors (transport, communication, facilities management, commercial, etc.) consume 43% of the final uses of energy. For more than 10 years, the Lombardy Region has developed policies to reduce energy consumption and improve energy efficiency in the construction industry with restrictions on performance requirements for new buildings and funding tenders for building modernization. This project has not been developed yet, but, in view of the LEED approach, the main challenges to face are: to match resource efficiency (use of recycled materials) with energy efficiency (material performance requirements) and to study the market response to the use of recycled materials.

A review of TLJ2 Good Practices by F. Balkau



This second round of Good Practices shows a growing consciousness of life cycle issues and an increased use of standardised methodologies. Among the practices presented, LCA is the most used assessment instrument and EPD the most used management tool.

It is encouraging to note that some measurable resource efficiency results have been achieved. This demonstrates the relevancy of the use of LCA and LCM not only by the industry but also by the public sector. Both contribute to achieving the SDGs. In the case of the practices presented during the TLJ, most of the resource efficiency issues tackled concern energy and greenhouse gas reduction which are replying to SDG 7,12,13.

Many examples of LCA application in the construction sector are available, in particular energy efficiency in buildings. This is definitely an interesting area but partners could benefit even from a broader variety and scope of practices, for example including also products. It would also be relevant to learn more about the links to public policy on resource efficiency and focus more on public institutions rather than the industry.

Partners are encouraged for the upcoming TLJs to highlight more the challenges, lessons learned, experience exchange potential of their practices, focusing on an analytical presentation rather than descriptive.

PEER REVIEW

Focus on Navarre's policy instruments: a dialogue on how to improve public policies through life cycle approach.

The peer review is an essential part of the exchange of experience process. Each Transnational Learning Journey foresees a peer review session focused on the policy instruments of the hosting region.

The Navarre's policy focus is on circular economy, waste management and climate change, with a wide-ranging set of policy instruments to address the challenges. There is a major emphasis on waste and decarbonisation, with less mention of other SDGs.

The session started with a discussion based on three observation points: the overall use of policy instruments in Navarra, the use of life cycle methods in the region, and a reflection on the replicability of Navarre's experience that could be useful to transfer in other regions within the consortium.

Observation 1. – adequacy of policy instruments in Navarra to enhance resource efficiency

Observation 2. – extent and sufficiency of life cycle methods in applying policy instruments

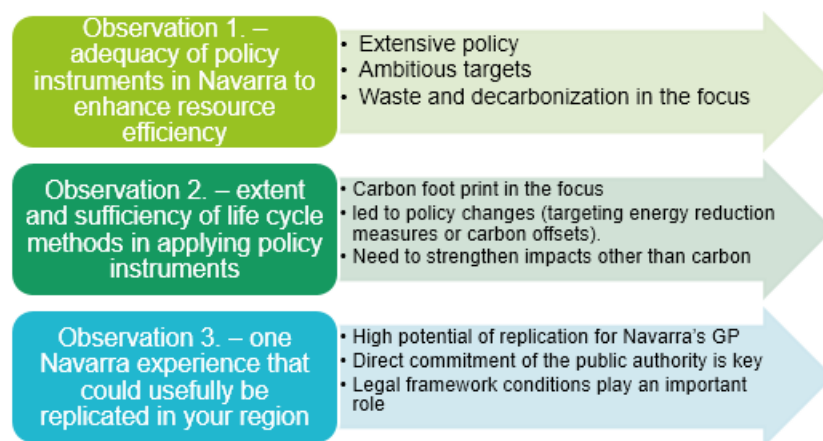
Observation 3. – one Navarra experience that could usefully be replicated in your region

The policy scenario of Navarre is seen as a great achievement from the regional development point of view since the policy instruments and regulatory frameworks lead to the low carbon and circular economy plans for the long perspective until 2050.

Concerning the LC tools, both LC assessment and LC management methods are employed in the presented Navarre's good practices, with reference also on how the use of LC has led to policy changes, as for example in targeting energy reduction measures or carbon offsets.

The participants found interesting the idea of involving public authorities in calculating the carbon footprint and they agreed on the fact that many of the experiences could be easily applied in other regions if the political objectives are coherent with the regional context, resources, economy, and production structure.

The session ended with three rounds of interventions from partners and external experts that exchanged opinions regarding the implementation of this very ambitious plan, from a financial perspective, as well as about the development or use of relevant technologies which can enable the replacement of fossil fuels with renewable ones.



Peer review wrap-up highlighting the main outputs

This productive peer review discussion on Navarre's policy is a step ahead in the exchange of experiences of the project, that hopefully will allow other regions to exploit these policies and the hosting region to draw inspiration for the project action plan.

The full session of this fruitful exchange experience can be watched again [here](#).

THE CARBON METRIC TOOL

Ramy Salemdaab, Environmental Analyst at Zero Waste Scotland (ZWS) presented the ZWS Carbon Metric Tool.

Zero Waste Scotland supports the circular economy governmental strategies working across different themes, tackling the issue of **climate change and decarbonisation** of the Scottish economy. This vision led to develop the [Carbon Metric](#) in 2013, a very inspiring way to look at waste management. Today this exciting work has moved forward, by looking at the waste generated from different perspectives and by providing **additional insights to policymakers**.

The Carbon Metric Tool

The Carbon Metric measure the **all life carbon impact** of Scotland's waste from **resource extraction and manufacturing to waste management emissions**, with respect to where this impact occurs.

Unlike many tools and methods that focus on the emission associated with direct waste management activities, the carbon metric – that includes all life cycle impacts – it is an effective way to **assess the substantial environmental benefits associated to waste prevention**.

Rather than a mere accounting tool, the Carbon Metric Tool represents a **decision-support tool that can help policymakers in taking environmental impact into consideration when they work on new policies and strategies** to address the issue of climate change.

When it comes to waste, each city or region has different waste categories that cover different waste sources; in each country, there are own operation activities, and waste recycling and disposal methods. To drive waste prevention

and management in order to reduce the carbon footprint, the goal is to reduce local emissions. Scotland has managed to reduce the life carbon impact of waste in the last seven years by improving the quality of recycling waste streams and increasing the tonnages of separate collection food waste

“More circularity, less carbon” campaign



In November 2019, ACR+ launched the [“More circularity, less carbon”](#) (MCLC) campaign to mobilise members of its networks and decentralised authorities in the fight against climate change while taking into account the local carbon footprint and existing dynamics. They will build on their key role as public authorities, mobilising local stakeholders and citizens, to drive waste prevention and management

and advance the circular economy throughout their jurisdictions in order to reduce carbon impacts. Their goal? Reduce the emissions linked with local resource management by 25% by 2025.

The campaign is building on the work initiated by Zero Waste Scotland and is based on the Carbon Metric International tool, an expansion of the Carbon Metric tool. This tool takes local and region-specific carbon factors into consideration. It has been developed to be used by different regions and cities to estimate the carbon footprint of waste: that is why it has been shaped to be as user-friendly, robust, and reliable as possible and easy to adapt.

Going beyond carbon

The next step in the journey towards decarbonisation is to go beyond the carbon impact, which does not necessarily reflect the actual environmental cost of waste and material. For example, investigating bio-based plastics, it might turn out a lower carbon impact compared to the fossil-based plastics, but there might be other outcomes considering other factors like land and water footprint to produce the material.

Starting looking beyond carbon means to **look at different parameters towards a holistic environmental assessment of materials and products.**

In order to properly implement the life cycle thinking along the decision-making process, it is key to involve and build bridges among LCA community practitioners.

SITE VISITS

Despite taking place online, this TLJ included two study visits, one of the companies presented transforms and valorizes winemaking by-products whereas the other uses olive trees to make quality products. The two companies explained how they work on resource efficiency, their experience to contribute on policy changes and how the use of LCA has helped them on decision making.

AGRALCO



[Agralco S. Coop.](#) was founded in 1962 by several wineries from Navarra and La Rioja, to group the activity of small alcohol producers in the region in the new plant in Estella.

Agralco's activity focuses on three main aspects:

- **Regulation of the wine market:** Agralco is a distillery authorised by the Spanish Agricultural Guarantee Fund (FEGA) to collaborate in the regulation of the wine market by facilitating compliance with the Compulsory Wine Service for wineries;
- **Environmental:** Winemaking waste manager of the associated wineries with authorization number NAV-17-99;
- **Energy Efficiency:** process optimization, self-supplying of fuel and self-supplying of electricity.

In their facilities, 60,000 Tm of wine residue (solid fraction of the grape remaining after pressing for vinification) and 20,000 Tm. of lees (liquid fraction from the decantation of the wine after fermentation) are processed annually.

Energy management and use of waste

The sub-products of winemaking (grape residue and wine lees) and the wines delivered by the wineries are processed to obtain different types of alcohol, lime tartrate, enocyanin, grape seed oil, biomass (degreased seed flour and dry pomace), and fertilizers.

And, in addition, they are generated for self-consumption:

- 10,000 tonnes of biomass (dry grape skin);
- 1,750,000 Nm³ of biogas with which 4375 Mw.h. of energy are generated in the cogeneration engines.

International Sustainability & Carbon Certification

Since its origins, Agralco S. Coop. has always sought continuous improvement of its processes and products, seeking an added value of what is obtained and adapting it to the market demand. Four years ago, they reoriented their production, and changed the obtention of alcohol for industrial use to bioethanol. Since then, they have calculated their carbon footprint annually, from the exit of the by-products at the wineries to the transport of bioethanol to its destination, using the International Sustainability & Carbon Certification (ISCC).

[Video](#)

BIOSASUN



[Biosasun, S.A](#) is a SME located in the Basque Country-Álava and Navarra. Founded in 2001 by the interest of various professionals in the production of organic products.

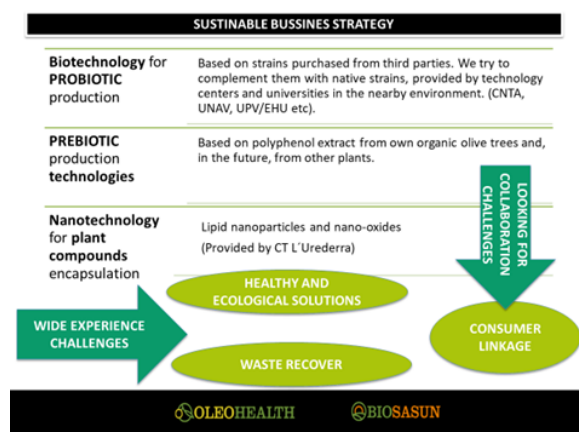
[Allotarra Association of Ecological Agriculture and Livestock](#) is made up of various farmers from Tierra Estella-Lizarraga (Navarra). Its main activities are the practice and promotion of agricultural, livestock, commercial and professional activities. After cultivating organic olive trees for more than 30 years, its objective is to make organic farming and its sustainable processes available to all, always respecting the environment and its resources.

Extra virgin olive oil is 100% pure organic olive juice, of superior category obtained directly from olives and only by mechanical procedures. Always using agricultural techniques and in oil extraction processes, environmentally friendly techniques in organic agriculture.

The process of producing the oil that was subcontracted in a mill near the area, at the time of the study, consisted of: discharge of the olive, washing and removal of leaves, crushing, smoothing at low temperature, horizontal centrifuge, vertical spinning, storage in tank, decanting and packaging.

LCA and Results

From January 2008 to December 2010 Biosasun was working in the European Project RECYWASTEOLHIVA: Recycling and reusing of all waste produced during olive oil production in order to develop high added-value products, led by the Technological Centre L'Urederra, where the LCA tool developed and used allowed the calculation of the ECOLOGICAL, ECONOMIC AND



SOCIAL impacts of the classic production of extra virgin olive oil. This tool is based in the use of an impact matrix to improve processes and make them more sustainable:

CF diagnosis and Results

In 2012 Biosasun calculated the carbon footprint by determining the total amount of CO2 emissions and other greenhouse gases (GHGs) caused directly or indirectly. Based on the information collected, the value chain associated with oil production was determined by identifying the different inputs and outputs.

Read this case study to know more general limits, first action plan, action plan for the reduction of emissions in a technical-economic way, indicators monitoring, and more:

[Presentation](#)

[Full document](#)

[Video](#)

A review of TLJ2 site visits from a life cycle perspective by F. Balkau



Both case studies show how forward-looking companies can successfully diversify beyond their original industrial products (wine, grapes, olive oil) by looking at the life cycle of their materials flows.

On the 'upstream' side a better control over materials and energy flows allows an optimization of the supply chains, reducing at the same time the environmental burden. On the downstream side, they seek additional value from what was traditionally considered a waste stream that required expensive treatment (or a polluting release into the environment) but now becomes a source of additional high-value products.

A closer focus on squeezing value from waste can even lead to a situation where the secondary outputs have a higher commercial value than the original product, seriously shifting the focus of the company and its supply-chain. Agricultural products in particular are susceptible to such a 'whole of life' resource management approach.

Clearly identifying key stakeholders and partners and integrating them into such a life cycle management approach is a key success factor. This approach also involves optimizing a number of SDGs simultaneously, including carbon footprint, water resource management, biodiversity protection, and land management.

A whole of life cycle approach to resource management has benefits for the enterprise, for the region and for the environment.

TLJ #2 Lessons learnt



The high cost of LCA: a matter of perspective?

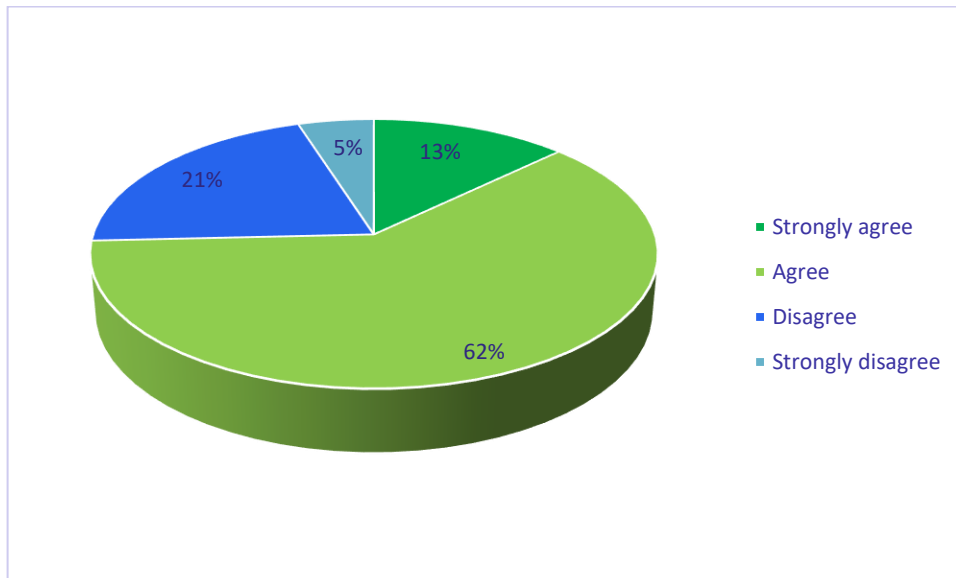
A trend that emerged quite clearly from this TLJ is that the LC tools are **perceived locally as very expensive**. Besides reinforcing the argument of fiscal incentives to promote LC methods, the project ought to emphasise means to **wipe-out this threat**. Through its stakeholder network, especially at the local level, the communication effort must focus on the cost/benefits ratio in order to enhance the efficacy of LC instruments and evaluate the **long-term return on investments and benefits** resulting from the application of LC methods that can justify the cost of certain life cycle tools.

COVID-19: an opportunity?

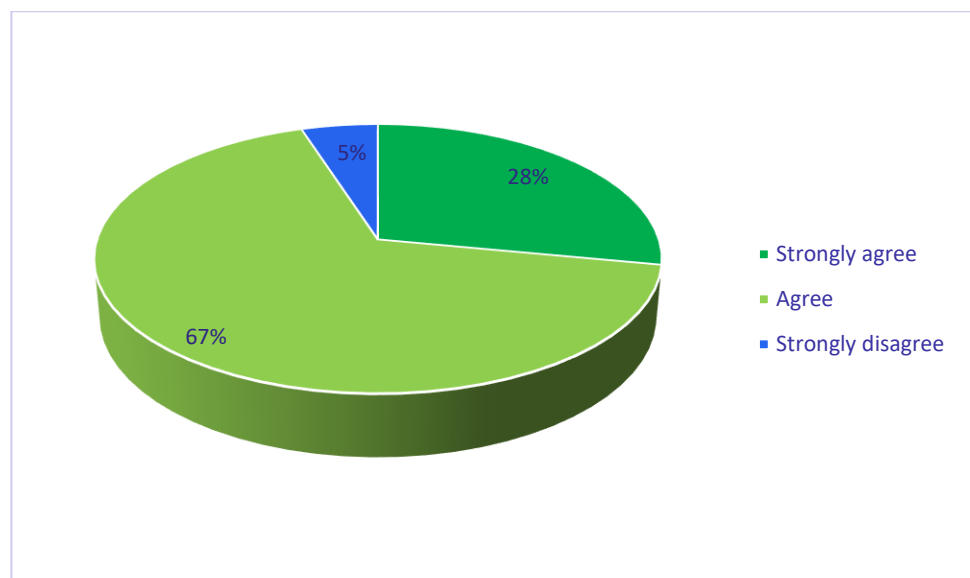
LCA4Regions partners strongly believe that, now more than ever, **integrating life cycle thinking into regional decision-making** is essential. One of the most important results in terms of threats identified during the regional analysis benchmark is the **political inertia**: slow political changes in processes seem too hard to transform. The current situation created by the pandemic could be interpreted as the way forward. A lot of production schemes will be forced to convert in order to jump-start the region's GDPs and recover socio-economic indicators in the after-crisis times.

Participants' feedback

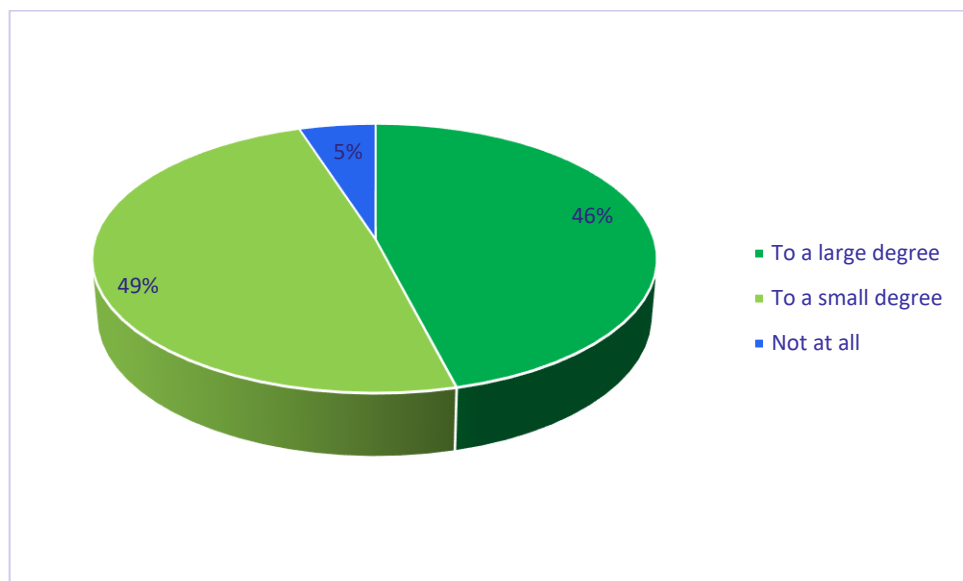
I FELT THE NEED TO **INCREASE MY PROFESSIONAL CAPACITY** BEFORE PARTICIPATING IN THE ON LINE EVENT.



DURING THE ON LINE EVENT, I CAME ACROSS **INTERESTING PRACTICES AND IDEAS**.



THANKS TO YOUR PARTICIPATION IN THE EVENT, DO YOU CONSIDER THAT YOU HAVE **INCREASED YOUR PROFESSIONAL COMPETENCE?**



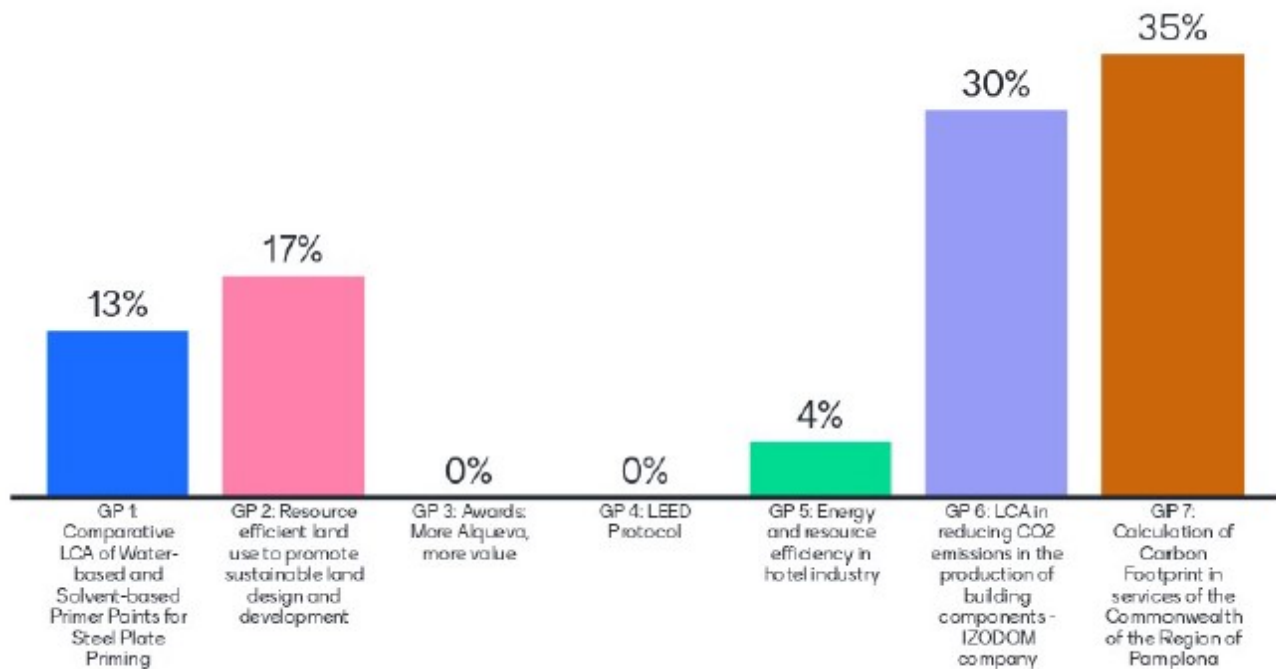
INDICATE WHICH ARE THE PRACTICES / IDEAS YOU FOUND THE MOST INTERESTING AND WHY

"THE CALCULATION OF CARBON FOOTPRINT IN SERVICES OF THE COMMONWEALTH OF THE REGION OF PAMPLONA SHOWS A CONCRETE COMMITMENT OF THE PUBLIC AUTHORITY"

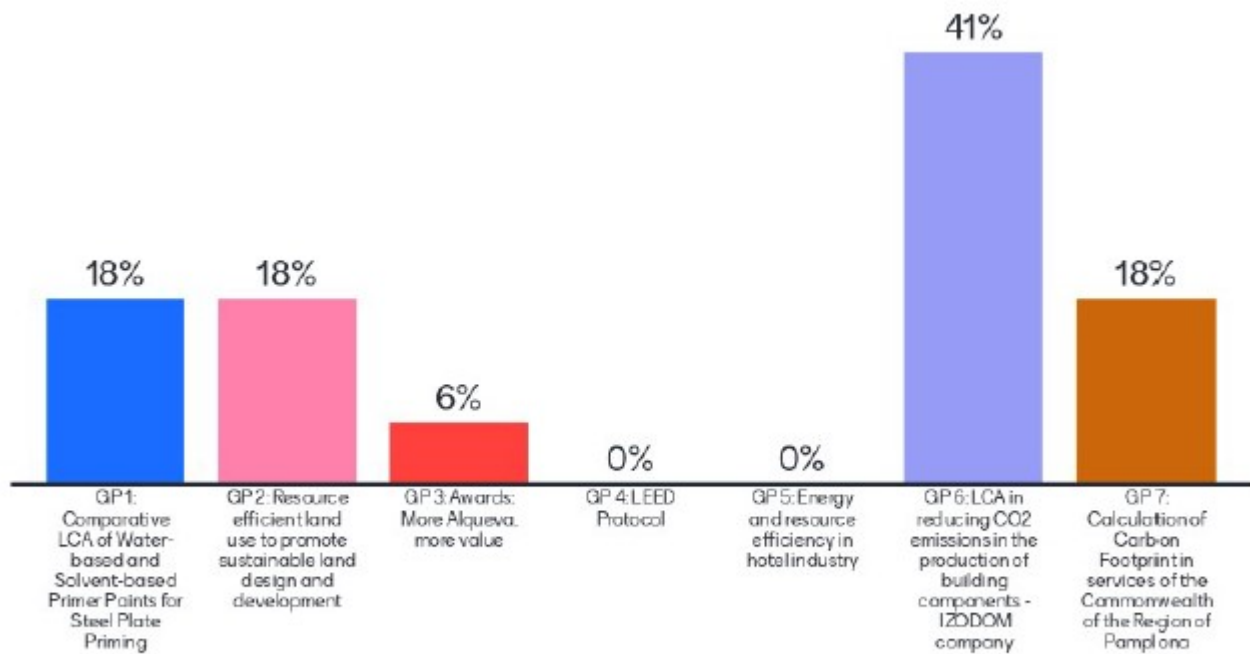
"TOTAL LIFE CYCLE ASSESSMENT BY BIOSASUN"

"GOOD EXAMPLES OF CIRCULARITY AND ECOLOGICAL PRODUCTS, SITLL HAVE A ROOM TO IMPROVE LCA APPROACHES. VERY INTERESTING POLICY FRAMEWORK AND EXCHANGES"

WHICH IS THE GOOD PRACTICE YOU CONSIDER MORE INTERESTING FOR RESOURCE EFFICIENCY?



WHICH IS THE GOOD PRACTICE YOU THINK CAN BE BEST APPLIED TO PUBLIC POLICIES?



EXPLAIN FURTHER HOW THE INCREASED COMPETENCE IMPACTS YOUR DAILY WORK

A LOT OF INFORMATION WAS PRESENTED AND SHARED, I NEED TO ANALYSE BITE MORE THE LCA APPROACHES FOR COVID19 WHICH WAS AN INTERESTING REMARK, AND THE NEED TO FIND THE COMPLEMENTARITY AMONG POLICIES AND OBJECTIVES. I WILL BE MORE RECEPTIVE TO FOLLOW UP ACTIVITIES



LCA KNOWLEDGE, LEARNING FROM EXAMPLES - I FOUND IT VERY INTERESTING

IT IS VERY IMPORTANT TO UNDERSTAND HOW TO GENERATE IMPACTS

NEED TO THINK ABOUT THE LCA METHODOLOGIES EMBEDDED ON CLIMATE CHANGE PLANS, CIRCULARITY FOR INDUSTRY. THE SESSION GIVES AN INSPIRATION TO HAVE MORE DEEP ANALYSIS

INTERESTIG INTELECTUAL QUEST FOR LCA KNOWLEDGE LEARNED BY GP CASES

USEFUL CASE STUDIES

LEARNING FROM THE STUDY VISIT AND THE COMMENTS AND OBSERVATIONS OF THE OTHERS EXPERTS

AFTER LISTENING TO THIS SESSION PRESENTATIONS, WHAT DOES THE CONCEPT OF “LIFE CYCLE APPROACH” SUGGEST TO YOU?



RELEVANT INFORMATION RELATED TO THE LEARNING PROCESS

The **role of the public authority** should be stressed more and more

Very **professional event**
full of useful knowledge

More manufacturers or service providers would be **benefited**, I believe



Conclusion

This second TLJ was without any doubt a strong learning experience as partners had to adapt to the situation and organise it online with all the challenges the digital solution brings. But above all, it was an important step to continue the fruitful exchange of experience started in Kaunas. This will lead, at the end of the first phase, to the elaboration of 7 Action Plans. A second issue of the [newsletter](#) has also been published to summarize the project's achievements so far.

The next TLJ, scheduled in October 2020, will travel to Satakunta region in Finland, hosted by the Pyhäjärvi Institute. The TLJ#3 will focus on the **exchange of experience on LCA for waste management and material flows**.