Transnational Learning Document #6

LCA for monitoring and evaluating policies

November 2021

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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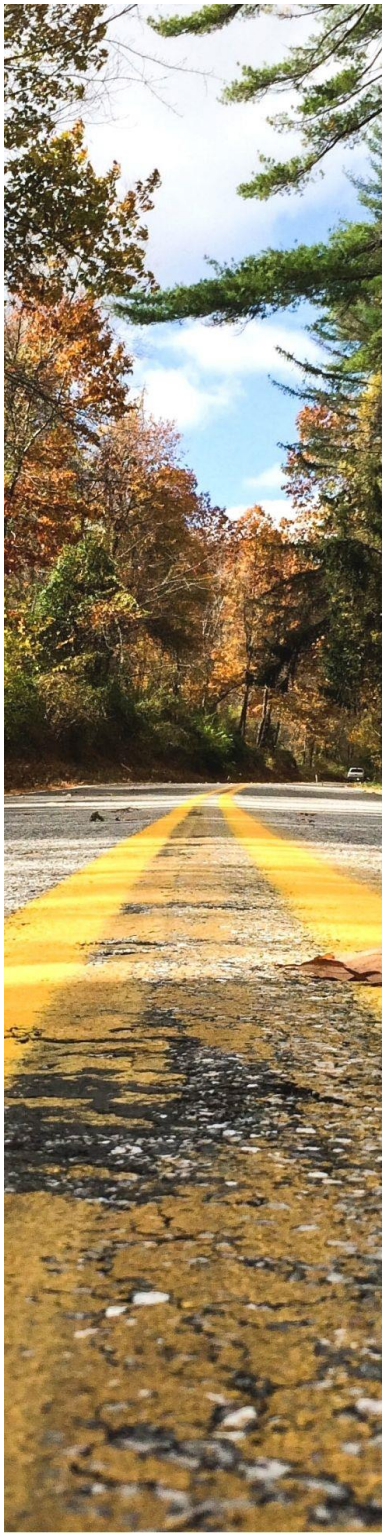

Purpose of the document

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 elaborates 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 sixth Transnational Learning Journey that took place in November 2021 in the Lombardy Region, in Milan (and online).

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. The first phase of the project, the "Interregional Learning", counts 7 TLJ:

- TLJ #1: Life cycle methodologies in environmental and resource efficiency policies and tools to apply LC into practice | Kaunas (LT), January 2020
- TLJ#2: Life cycle methods for resource-efficiency | Navarre (ES), June 2020
- TLJ3#: LCA for waste management and material flows | Satakunta (FI), October 2020
- TLJ#4: LCA in public procurement and materials | Slovenia, May 2021
- TLJ#5: Training and capacity-building in LCA | Lodzkie Region (PL), September 2021

The last meetings will be in Baixo Alentejo (PT).

Transnational Learning Journey #6

22-24 November, Milan and online

OVERVIEW

The 6th TLJ took place in Milano and online organised by the Lombardy Region. It was part of the Lombardy's Second Sustainable Development Regional Forum. The sessions of this three-day event were the following:

- **Setting the framework of the use of LCA for monitoring and evaluating policies:** this session was composed of three parts to tackle LCA at EU level, LCA at national level, and how to measure and evaluate policies supporting the transition towards a circular economy. While the two first parts included presentations, the last one was a round table with several panelists.
- **LCA good practices on monitoring and evaluating policies:** presentation of good practices from partners' regions - Lodzkie (PL), Satakunta (FI), Western Slovenia (SI), Navarre (SP), Baixo Alentejo (PT), Kaunas (LT). It was followed by a presentation and discussion on partners' first steps toward the action plans. In the evening, a study visit took partners to the Milano Food Hub.
- **Day 3: Peer review:** the peer-review session gathered ideas for developing the future action plan in Lombardy.

The first day of the TLJ has been recorded and can be watched here.

AGENDA

DAY 1 – Setting the framework of the use of LCA for monitoring and evaluating policies

22 November 2021 | 15:00 – 18:00

15:00 – Welcome

15:10 – LCA at EU Level

Life cycle assessment for supporting policies in the UE: an overview and some pilot initiatives for the monitoring and evaluation of policies | *Serenella Sala, European Commission Joint Research Centre Directorate D – Sustainable Resources Land Resources Unit (D3)*

Monitoring life-cycle performance of European geothermal power plants | *Federica Rosasco, Rina Consulting spa*

Q&A session

15:45 – LCA at national level

The Italian Network for Life cycle assessment: "Mission and activities of the Italian network for LCA" | *Monica Lavagna, ABC Department – Politecnico di Milano*

"An ongoing research: LCA in the Waste management Regional Programme of Italian regions" | *Lucia Rigamonti, DICA Department, Politecnico di Milano*

"How PEF methodology can support the green transition? The case of Made Green in Italy policy" | *Francesco Testa, Sant'Anna Scuola Universitaria Superiore Pisa*

Q&A session

16:45 – Panel discussion: Measuring and evaluating local policies supporting the transition towards a circular economy

Chair: Francesco Lembo (ACR+), Alessandro Dacomo (Lombardy Region)

Panelist: Genova Municipality, Circular Regions, ENEA (Italian National Agency for New Technologies, Energy and Sustainable Economic Development)

Q&A session

DAY 2 – LCA good practices and action plans

23 November 2021 | 09:30 – 12:30

09:30 – LCA good practices on monitoring and evaluating policies

Q&A session

10:30 – First steps toward the action plans

Some experiences from other projects – CircE Project | Alessandro Dacomo (Lombardy Region), Mireia Cañellas Grifoll (Catalonia Region)

Discussion among partners

DAY 3 – Peer review

24 November 2021 | 09:30 – 10:30

09:30 – Peer review of the Lombardy Region policy context

10:30 – 12:00 – Steering group meeting

LOMBARDY REGION

Ahead of the TLJ partners received a document on the policy context of the Lombardy Region, with the possibility of asking questions to prepare the peer review session.

A brief summary of this document, available online, is shared hereafter.

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Country: Italy

Capital of the region: Milan

Population of the region: about 10 million inhabitants

National context:

One of the region in Europe with the highest GDP per capita, the Lombardy Region presents an economy characterised by a variety of activities in all the traditional sectors (farming, heavy and light industries, services). SMEs, mostly family owned businesses, dominate the market.

In 2017, almost 40% of the total firms of the region are based in Milan and its province, and the main sectors are: mechanical, electronics, metallurgy, textiles, chemicals and petrochemicals, pharmaceuticals, food, publishing, footwear and furniture. The service sector is also very well developed and mostly related to international trade and financial services.

Lombardy's production system is still one of the most developed in Italy and Europe: at the end of 2016 there were 74 enterprises per 1000 inhabitants, one of the highest rates of entrepreneurship in Europe.

The Lombardy region is the first manufacturing region in Italy in terms of turnover and added value, and the third one in Europe concerning the number of employees (1 million persons). Lombardy is the leading manufacturing industry in Europe regarding some sub-industries such as manufacturing of metal products (excluding machinery and equipment), textile industries, production of base metals, manufacture of wearing apparel, printing and reproduction of recorded media, wood and products of wood and cork (except furniture).

With 14 universities and many more research centres, Lombardy is the first Italian Region by number of patents registered at the European Patent Register concerning manufacturing technologies.

In the last five years, since circular economy (CE) has moved its first steps in the EU agenda, Lombardy has witnessed many initiatives involving policymakers, enterprises and research centres to especially enhance waste prevention and material recovery. These pioneering, often bottom-up initiatives have been recently framed into a first Roadmap focused on Research & Innovation in CE.

LCA experience

The Life Cycle Approach in Lombardy Region policy making was applied mainly to support the Waste management regional Programme, in particular to support the

development of the version of the programme currently in force:

- to evaluate the environmental performance of the municipal solid waste management system implemented;
- to evaluate the environmental and economic performance of the construction and demolition waste management system, to identify recommendations for the regional government in order to maximize resource-efficiency.

In 2021, Unioncamere Lombardia and the Regional Government designed "Call for innovation of circular economy value chains in Lombardy" to boost circular economy transition. This call was devoted to support the SMEs transition to CE. Among the evalution criteria set, one LCA based criterion was introduced: the scoring system to be used in the evaluation of the projects, awarded projects which were supported by a LCA study or a PEF study, coherent with the official "Category Rules", capable of proving the positive impact of the project on the environmental performances of the activity run.

Potential use of LCA in supporting policies

Analysing the peculiarities of different kind of policy instruments under the responsibility of regional government, the team of the Lombardy Region identified solutions to introduce life-cycle criteria in regional policies, in particular related to the energy sector and circular economy. These solutions are:

- selection / prioritization of policy options – e.g.: assessment in the life cycle of the environmental impacts avoided thanks to the adoption of various actions, with the aim of defining priority scales of the various options on the basis of the best cost / benefit ratio;
- introduction of eligibility requirements – e.g. access to regional planning incentives or implementation plans (e.g. in relation to buildings construction) only with an

LCA analysis or if they are demonstrated through LCA-based indicators, minimum environmental and climate impacts in the life cycle;

- regulation on energy efficiency in buildings - extension of regulation to sustainable buildings with the introduction of requirements based on LCA-based indicators that consider the impacts of the supply chain, in terms of CO2 produced, consumption of fossil energy and other resources, etc.;
- procedures for evaluating plans (SEA) and projects (VIA) - integration of LCA-based criteria among those already provided for the authorization and evaluation measures;
- in the elaboration of new plans, the use of LCA-based tools can be proposed e.g. to characterize some actions, in particular those related to the refurbishment of the public building stock, to evaluate the effects of the plan action taking into account other impacts in addition to those already foreseen (CO2 emissions, reduction of energy consumption, increase in RES) and to correlate them with the elements of scenario and target;
- for monitoring of plans (PREAC, PRIA, POR FESR) - possible introduction of LCA-based indicators or methods to complement the monitoring indicators already provided; possible criticalities could be the application of these criteria to existing plans and the collection of the necessary data;
- as part of incentive measures for the refurbishment of the building stock - possible introduction of LCA-based criteria that must be satisfied by interventions encouraged in calls and measures such as incentive access requirements or as reward criteria – e.g. threshold values that must be respected (synthetic and easily calculable and comparable), presence of LCA analysis to support projects alongside the energy diagnosis, presence of product certifications for individual components and materials, which is not

already mandatorily provided for by the construction CAM and available on the market.

Overview of suggestions of use of LCA per policy instruments

The results of the analysis for the potential inclusion of life-cycle criteria in selected policy instruments have been detailed in the document on the policy context of the Lombardy Region. Recommendations are shared for the following policy instruments:

- **European Regional Development Fund – Regional Operating Programme – POR FESR** (including POR FESR 2014-2020 and POR FESR 2021-2027): The POR FESR 2014-2020 promotes a smart, sustainable and inclusive growth model in line with the objectives identified in the "Europe 2020" strategy and with the regional government's development policies promoting the competitiveness and sustainability of its businesses and the entire economy of the Region. It is divided into priority Axes, in turn made up of Specific Objectives associated to a series of Actions and Indicators:

    - Axis I - Strengthen research, technological development and innovation
    - Axis II - Improving access to information and communication technologies, as well as their commitment and quality
    - Axis III - Promote the competitiveness of small and medium-sized enterprises
    - Axis IV - Support the transition to a low carbon economy in all sectors
    - Axis V - Sustainable urban development
    - Axis VI - Tourism strategy of the Inner Areas
    - Axis VII - Technical assistance

  The development of the POR FESR for the period 2021-27 is currently ongoing, with an early draft already available. It is articulated into 3 Priorities and a set of 11 Specific Objectives:

- Priority OP1 - A more Competitive and Intelligent Europe;
- Priority OP2 - A Greener, Low Carbon Europe and in Transition Towards Decarbonisation and Resilience;
- Priority OP5 - A Europe Closer to Citizens.

Currently, LCA is explicitly included in the draft in relation to four actions linked with the promotion of energy efficiency and the reduction of greenhouse gas emissions; the development and strenghthening of research and innovation capacities; the promotion of the transition to a circular and resource efficient economy.

- **Regional Programme Energy, Environment, and Climate – PREAC**: this programme is currently under development. It will design the stages of a path that will lead Lombardy to be a region with net zero emissions by 2050, resulting from the reduction of GHG emissions and of the absorption of soil, forests, natural wells, etc. and in a leading position in the commitment to implement climate policies and in the development of a competitive and sustainable economic system. Lombardy Region actions will focus on an increase in the value of its territory based on four main guidelines:
  - reduction of energy consumptions by increasing efficiency in the final use sectors;
  - development of local renewable sources and promotion of self-consumption;
  - growth of the production system, development and funding of research and innovation at the service of decarbonization and the circular economy;
  - adaptive and resilient response of the Lombard system to climate change.
- **Waste Management Regional Programme**: currently under development, the new version will be delivered in

spring 2022. This new programme is also called Toward Circular Economy Plan. It presents new approaches and contents, such as sections dedicated to special waste, waste prevention, packaging, asbestos. It does not intend just to deal with waste management, but also with different crucial activities in doing circular economy, across all the value chain.

- **Regional Strategy for Sustainable Development**: aims to outline the commitments of the institutions and the socio-economic system, from now to 2030 and then to 2050, in pursuing the aims and objectives of the United Nations 2030 Agenda on Sustainable Development. The perspective, the concept is not just to make investments in certain sectors or to allocate more efficient or green resources: it is about changing ways of thinking, behaviours, approaches, systems of values, starting first from individual ones, but with a strong triggering role played by the public administration that, even before proposing financial or regulatory interventions, can act as a forerunner with its own strategic choices towards a new "culture of sustainability". The Strategy identifies 5 strategic Macro-areas. The Macro-area closest to the LCA4Regions' topics is area n. 4 Mitigation of climate change, energy, production and consumption. Each area collects several local/regional objectives, coherent with the Agenda 2030 ones and with the National Sustainable Development Strategy ones. The Strategy provides also a reference framework for each area and objective.

In addition, a presentation of the **National Recovery and Resilience Plan** is included in the document prepared by the Lombardy Region. Although not under the competence of Lombardy Region, this plan – currently in development – is important at the Italian national level in the context of the most important programme at EU level, i.e. the National Recovery and Resilience Plan (Piano Nazionale di Ripresa e Resilienza, PNRR or NRPP), part of the Next Generation EU (NGEU) programme. Based on the documents available from the Italian Government, the Recovery and Resilience Plan presented by Italy envisages investments and a consistent reform package, with € 191.5 billion in resources being allocated through the Recovery and Resilience Facility and €

30.6 billion being funded through the Complementary Fund established by the Italian Government. The Plan is developed around three strategic axes shared at a European level: digitisation and innovation, ecological transition, and social inclusion. It is an intervention that aims at repairing the economic and social damage caused by the pandemic crisis, contributing to addressing the structural weaknesses of the Italian economy, and leading the country along a path of ecological and environmental transition. The NRRP will substantially contribute to reducing territorial, generational and gender gaps. The Plan also includes an ambitious program of reforms to facilitate the implementation phase and, more generally, to contribute to the modernization of the country and make the economic environment more favorable to the development of business activities.

The team behind the Lombardy Region

Alessandra Norcini (Project Responsible)

Environmental engineer, in Lombardy Region administration since 1997, worked in territorial planning, environmental strategic and impact assessment, environmental information systems and social housing; now, in DG Environment and Climate, head of Unit Nature and Biodiversity and representative in the National Committee for sustainable development. Involved in many territorial projects and in teams of regional plans on waste management, energy and climate, regional territorial and landscape planning, regional Strategy for sustainable development and regional Strategy for Biodiversity

Alessandro Dacomo (Project Manager)

Environmental Scientist, born in Suna, on the shores of the Lago Maggiore, after having worked in remote sensing, cartography, landscape ecology, environmental information systems and fair trade, landed on Lombardy Region DG Environment, where supported the Environmental Impact Assessment Unit for some years, before focusing on Circular Economy and Sustainable Development, in particular managing European projects and supporting the regional Environmental Authority.

Olga Chiaramonte (technical support)

Architect, active for 15 years in the field of housing, exhibition, landscape and urban design, she's working in Lombardy Region DG Environment and Climate for a few months. Absolute beginner in the field of European Projects, hopes to bring her previous experience in this new professional area.

Valentina Sachero (Technical support)

Environmental Engineer, joined Lombardy Region – DG Climate and Environmental in 2008, after ten years of professional collaborations with private companies, Universities and Public bodies (Regional Agency for Environmental Protection). Energy Efficiency and RES development in civil sector is the main issue dealed with in the last decade, a challenging item happily approached after a walking through air quality modelling, noise impact simulation and sustainable water management.

In addition to its team, the Lombardy Region is receiving technical assistance from Rina Consulting for the LCA4Regions project.

Giorgio Bonvicini (RINA Consulting)

Energy Engineer with around ten years of work experience in climate change and energy transition topics, he is a Certified Energy Management Expert according to the Italian regulations, lecturer of "Carbon Footprinting and Carbon Trading" for the Master in Climate Change at Politecnico di Torino, Co-Chair of the RHC-ETIP HWG on Districts endorsed by the European Commission to support renewables in heating and cooling sector.

He contributes to many EU co-funded R&D projects in the field of energy transition, supports private companies, financial institutions and public authorities with studies and technical assistance for climate change-related programmes, policies and strategies and investments in energy/resource efficiency and climate change mitigation and adaptation.

Federica Rosasco (RINA Consulting)

Federica Rosasco is a junior sustainability and climate change expert with three years of experience and a Master Degree in Civil and Environmental Engineering. During her work experience at the Joint Research Center of the European Commission, she has contributed to projects in the field of energy efficiency in buildings, renewables and energy infrastructures.

Moreover, in the engineering consulting field, Ms. Rosasco has delivered projects related to corporate sustainability reporting (e.g.: materiality matrix definition, benchmark analysis with peers, application of GRI Standards, preparation of data collection and consolidation tools), quantification of GHG emissions and life-cycle modeling, non-financial disclosures ex Directive 2014/95/EU and ESG and HSE due diligences.

GOOD PRACTICES on monitoring and evaluating policies

LCA monitoring and evaluation in carbon footprint calculations using computer software | Lodzkie Region (Poland)

July 2018 – Ongoing

CF Expert - a tool supporting the monitoring of production and logistics processes by calculating the carbon footprint and assessing the life cycle

University of Lodz, which is a part of a nationwide consortium under the Biostrateg 3 programme, implemented a project concerning an innovative methodology for calculating the carbon footprint (CF) for frozen food by using production residues for the production of healthy food. In addition to developing a new production technology of healthy food, one of the tasks of the project was to optimize and validate the achieved results also in the future in terms of meeting the assumptions made for the carbon footprint calculation method. In order to accomplish this task, a database was created that includes the type of energy, raw materials, products, and statistical data. A methodology was developed to calculate CF for different modes of transport (external and internal) using transport energy consumption data. CF production was calculated for selected products taking into account the sum of all direct and indirect emissions. The model has been tested on the data of the freezing vegetable company, a consortium member. An expert program for counting the carbon footprint (CFExpert) was established, with the help of which technological processes are verified in order to minimize the carbon footprint in technologies and products and to assess economic effects. This tool can be adapted to various industries. The main beneficiaries of this good practice are the companies in the region and in the country where the production of goods has a significant amount of CO2 equiv per unit.

The tangible result of the project is a unique expert system for production process optimisation containing three levels of reporting, production scalability, intuitive GUI. The CFExpert system is able to quantify & show comparable processes in production, i.e. correct, incorrect or erroneous measurements due to faulty equipment. It has been pilot tested in a manufacturing company that is a consortium member. The system has proven itself in real industrial conditions. Applies to SDGs 9,12,13.

Doing good: carbon handprints as assessing positive impacts of companies and the public sector| Pyhäjärvi Institute (Finland)

January 2018 – Ongoing

Carbon handprint assesses beneficial environmental impact of offerings. Footprints of an improved and a baseline system are compared, based on LCA methods.

Assessing environmental impacts typically focuses on measuring negative effects that products, services, organisations, municipalities etc. cause to the environment. Standardised life cycle assessment (LCA) methods are established for evaluations. More companies are using these tools to pursue a business concept around reduced environmental impact of systems and products. Conveying false impression or provision of misleading information about environmental benefits, a process of "greenwashing", is of concern. A recognised method of calculating and communicating the environmental benefits of companies and organisations actions was lacking.

Concept of footprint looks to reduce its effects close to zero, whereas the handprint sets no limits to the good that can be achieved. Need for communicating positive environmental impacts has been identified among researchers, as well as frontrunner companies and municipalities with climate friendly initiatives..

The handprint concept is defined in the context of existing LCA-based methodologies. The scope is a carbon handprint. It is based on actual impacts of the products, services or technologies. The practise facilitates internal education or process management within an organisation. Handprints may attract new customers for a product or inhabitants to a municipality, when incorporated into branding and marketing initiatives. Case studies with companies have been assessed. Potential of handprint concept for public sector is analysed.

Case studies from different economy sectors have been presented and analysed. Suitability for addressing environmental handprints at public sector level is being analysed. The reliability of assessment of different environmental assessment studies has increased by provision of common guidelines.

Lithuanian Building Sustainability Assessment System| Kaunas University of Technology (Lithuania)

June 2018 – Ongoing

Lithuanian Green Building Council (LGBC), in partnership with One Click LCA Ltd. introducing the free tool One Click LCA Planetary to the Lithuanian market.

LGBC launched in 2013, is a non-profit organization, actively promoting the creation of sustainable environment and spurring innovations in the design, construction and operation of green buildings in Lithuania.

Their mission is to stimulate the creation of sustainable environment and raise public awareness of the advantages of sustainable environment and innovations, contribute to the improvement of life quality for an individual person, the community and society, and take decisive measures to reduce the environmental effects.

LGBC has developed and adapted to the Lithuanian market a standard for the assessment of the sustainability of buildings and a certification system prepared in accordance with globally recognized international assessment methodologies. The Lithuanian Building Sustainability Assessment System (LBSAS) is designed to objectively and transparently determine the level of sustainability of territories and buildings in Lithuania and to publicly declare the best practices of sustainable design and construction.

Construction industry professionals will be able to calculate and compare the impact of embodied carbon and the efficiency of the materials used in their building project. The tool also provides access to EPD databases.

Members are invited to engage in the priority areas of the LGBC and to contribute to the improvement of construction and housing policy, environmental protection and related legislation.

The main benefits are:

- Encourages design and construction of healthy, comfortable, long-lasting, economical, energy efficient buildings, rational use of natural resources at all stages of the building life cycle;
- Prepared according to globally recognized international assessment methodologies;
- Adapted to Lithuania, taking into account legal environment, economic realities, natural conditions and other important circumstances.

Wines Of Alentejo Sustainability Programme - WASP| CIMBAL (Portugal)

March 2015 – Ongoing

A programme to support economic agents in improving the environmental, social and economic performance of the region's winegrowing activity.

WASP aims to support economic agents in improving the environmental, social and economic performance of the region's winegrowing activity and to promote the recognition of the sustainability performance of the region's wines and to articulate the entire wine chain in the Alentejo within a philosophy of social, environmental and economic well-being at a local and regional level, with emphasis on the incorporation of eco-efficiency principles with the aim of promoting a more efficient use of resources, encouraging the reduction and reuse of coproducts by reducing internal operating costs.

WASP is voluntary and in order to begin implementation, it is compulsory to carry out a self-assessment. This was developed to be a standardised method to be completed with a performance levels assessment organised into different chapters applied to viticulture, cellar and viticulture&cellar and with primary and secondary Intervention chapters with different criteria. After completion of the self-assessment, an overall ranking called the 'General Sustainability Category' is established. The 11 Primary Intervention Chapters integrate 108 criteria. In a second phase the evaluation method adapted 7 more Chapters and 63 criteria. The criteria are included in chapters such as grape production, water, waste and energy management, packaging, etc.

WASP is a certifiable programme and a member can obtain a recognition in sustainability for the productive process by the use of the WASP stamp.

This strategy showed almost immediate results, with the Programme counting 93 members at the end of 2015, a number that has been increasing every year reaching, nowadays, 460 members. At the moment, 3 members are certified. The programme was also been award with several awards during the last years. On December 2019, it was awarded with the title of 2019 European Ambassador for Rural Innovation for the LIAISON project.

Trends in the use of LCC in Green Public Procurement in Slovenia| National Institute Of Chemistry - NIC (Slovenia)

2017 – ongoing

This example describes the use of life cycle costing (LCC) methodology on monitoring and evaluation of policies and implementation of good practices.

On 8 December 2011, the Government of the Republic of Slovenia adopted a Decree on Green Public Procurement, which would aid all contracting entities when launching a contract award procedure. The Decree stipulated that for 11 products (as of 2011) and service groups, public buyers would have to consider minimum and extra environmental requirements, as well as award criteria. It identified a number of statements or declarations, which can serve as proof of these requirements. The relevant area of green public procurement in Slovenia has undergone further development. Today's regulation on green public procurement covers 20 public procurement subjects, for which environmental considerations are mandatory.

The Green Public Procurement Regulation sets targets for individual items in each contract award that contracting authorities must complete when awarding a single green contract. Environmental requirements may be incorporated by contracting authorities in a number of ways, as technical specifications, as a reason for exclusion, as a condition of participation, as a criterion for the award of a contract or as a specific contractual provision. Contracting entities may include environmental requirements in one or more of the ways specified for each contract.

The relevant green public procurement regulation also allows the use of life cycle methodologies (e.g. life cycle costing - LCC) in tenders. According to the regulation on green public procurement,

the use of the LCC methodology is mandatory for the procurement of road vehicles. The use of the LCC methodology in other subjects of green public procurement is not mandatory, so we also did not detect that it would occur in public procurement tenders. According to the reviewed public procurement, LCC methodology is used in approximately 50 % of procedures.

Operational lifetime costs are in tenders typically calculated applying the following formula:

> [Expected lifetime mileage (=200 000 km) x [(Energy needed per km in MJ x price of Energy per MJ) + (emissions of CO2 kg/km x 0.03 EUR/kg) + (emissions of NO2 g/km x 0.0044 EUR/g) + (particulate matter g/km x 0.087 g/km)]

Here we provide a few examples of tenders in the period of 2018-2021, in which the LCC methodology has been applied. Slovenian tenderers use the LCC methodology in quite different ways and with different weights in terms of award criteria:

1. 2018: Purchase of electric hybrid buses for urban passenger transport (LCC represents 65 % of award criteria)
2. 2019: Purchase and supply of light trucks and lorries (LCC represents 100 % of award criteria)
3. 2019: Business rental of company vehicles, taking into account environmental aspects (LCC represents 100 % of award criteria)
4. 2020: Buying a low-emission van (LCC represents 70 % of award criteria)
5. 2021: Operational lease of less polluting civilian passenger cars and off-road vehicles and special vehicles with police and other equipment, tires with better fuel efficiency and better wet grip, appropriate for the season (LCC represents 95 % of award criteria)
6. 2021: Supply of environmentally less polluting vehicles with an associated spare set of winter tires (M + S) with better fuel efficiency and better wet grip, motorcycles and trailers for transporting horses (LCC represents 35 % of award criteria)

The LCC methodology in public procurement of road vehicles in Slovenia is regularly used in accordance with the Decree on Green Public Procurement. We present trends in this area for the period 2017-2020

- 2017 [2]:
  Number of tenders: 1860
  Value: 157 million EUR
- 2018 [3]:
  Number of tenders: 2270
  Value: 148 million EUR
- 2019 [4]:
  Number of tenders: 2168
  Value: 182 million EUR
- 2020 [5]:
  Number of tenders: 1670
  Value: 205 million EUR

Carbon footprint (CF) calculation of the departments activity in Government of Navarra| Government of Navarre & AIN (Spain)

January 2019 - ongoing

CF calculation of the Rural Development and Environment Department of the Government of Navarra: building activity (55 facilities) & mobility activity

Citizens distrust the Public Administration if there is no exemplary action. Public administrations need to address actions that demonstrate their climate commitment. As the Department is the unit responsible of climate change policy, in 2019 we started to calculate the impact of the Department's activity on GHG emissions identifying the main sources of emissions with the aim of measuring our impact and adopting the most efficient measures to reduce it.

The CF of the main building was calculated for 2018-19. In 2020, the calculation has extended to the 55 facilities and has included the mobility activity. CF scope 1, 2 & 3 emissions have been calculated including direct emissions (fuel consumption for heating and cooling, for official vehicles and refills of fluorinated air conditioning gases) and indirect emissions associated with electricity consumption and emissions associated with commuting. The information sources used were:

- Energy consumption of all facilities.
- Data on fuel consumption of official vehicles, fluorinated gas recharge and commuting.
- A survey was conducted to determine distances and ways of traveling to the workplace, which was answered by 32% of employees.

The results (2020):

- Department CF: 862,5 Tn CO2
- CF per employee: 1,5 Tn CO2
- 78% of CF is linked with mobility, 22% with buildings
- Electricity accounts for 61% of energy consumption in buildings.

Targets:

- Make workers aware of the impact on the climate.
- Prepare an improvement plan

In 2019, footprint fell to 48 TnCO2, 19% lower than in 2018, but it is assumed that this was mainly due to a warmer winter instead of the measures taken.

The internal contrast of the publication has aroused interest in investing in Energy Efficiency in the management teams of the Department. One of the facilities is going to take different measures to improve its energy efficiency.

Following the example of this initiative, 2 other departments started to calculate the CF of their main building.

Regional Green House Gas (GHG) emissions inventory| Government of Navarre & AIN (Spain)

January 2007 – ongoing

Annually Inventory of the GHG emissions generated in Navarra in order to get an exhaustive information on the scope and their distribution, and monitor them.

The GHG emissions Inventory (GHG emissions) is a voluntary initiative that collects the quantity of gases emitted into the atmosphere during a period of one year in Navarra, and therefore monitors the mitigation of emissions to address climate change:

It provides information on the activities causing the emissions, and the methods used to make the calculations and estimations.

It allows to know the sectors that contribute the most to emissions and their specific contributions, and so, to evaluate compliance with mitigation of emissions - globally and by sector – against climate change.

The inventory assesses GHG emissions in the sectors that originate them: Energy, Industrial Processes and other Products Use, Agriculture and Wastes. It is formulated based on IPCC methodology, in Common Reporting Format. Likewise, emissions are reflected in relation to the so-called traditional sectors: Electricity Generation, Industry, Transport, Residential and Services, Primary Sector and Wastes.

Both direct emissions, and emissions linked to electricity imported and exported to meet the annual electricity demand are considered. It establishes the emissions comparison taking as reference both 1990 and 2005. It is a tool to monitor the Navarra Climate Change Roadmap (KLINA). The methodology used for the inventory is the established by IPCC in 2006.

The inventory has been carried out continuously since 2007. Before that, in 2000, 2003 and 2005. It provides knowledge to the regional government to stablish and monitor mitigation measures to face climate change. In the case of Navara these measures are stablished in the KLINA.

Considering the last Inventory published, which is the one for 2018, a decrease of 21.07% with respect to the reference year of 2005 in the direct emissions can be seen. 14,74% in the case for total emissions.

National registry of carbon footprint (CF), CO2 compensation, and CO2 absorption projects| Government of Navarre & AIN (Spain)

March 2014 - ongoing

Registry to promote the calculation and reduction of CF of organizations, and encourage projects to improve sink capacity and become a tool to tackle climate change

The Registry, created by Royal Decree 163/2014, includes the efforts of Spanish organizations in the calculation and reduction of greenhouse gas (GHG) emissions generated by their activity. Individually, it is a good tool to help organizations to monitor and reduce GHG emissions.

At the same time, it facilitates the possibility of offsetting all or part of their CF, through a series of forestry projects located throughout the national territory. These projects integrate numerous environmental and social benefits, among which are the absorption of carbon dioxide from the atmosphere, also known as carbon sequestration.

It is organized in 3 sections:

- CF and GHG reduction commitment section: organizations calculate and reduce their carbon footprint every year
- CO2 sequestration projects section: forestry projects that increase CO2 sequestration
- CF offsetting section: organizations offset by acquiring CO2 sequestrated by forestry projects

The organizations who calculate their CF and establish a reduction plan, can register in section A. In the same way, if these organizations wish to offset their CF, it can be done through agroforestry carbon-sink projects in Spain, that would be registered in section B of the Registry. Finally, section C checks such offsetting and gives institutional backing.

The organizations registered in the CF section and reduction and / or compensation commitments may use a seal of ownership of the Ministry.

The number of inscriptions in the different sections of the voluntary Registry at the end of 2020 was: 3.241 in Section A, with 1.389 organizations registered; 63 in Section B; 146 in Section C. Total number of inscriptions: 3.450.

Total absorptions available at the start of projects: 36.360 tCO2

CO2 tons offset: 6.244

Number HC in the register by type of seal: “I calculate” 2.666; “I calculate and I compensate” 63; I calculate and I reduce” 442; “I calculate, I reduce, I compensate” 70.

PEER REVIEW

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 local policy instruments. Before the TLJ, partners received a document presenting the context and main policy instruments of the Lombardy region and had the opportunity to already ask some questions to be answered during the TLJ.

The peer review took the shape of a Q&A session, after a presentation of the policy context and instrument of the host.

The following questions were raised and subsequently answered:

Why Lombardy region decided not to use the LC based tools to support the ongoing revision of the Waste Management Regional Programme?

> The document being approved is an update aimed at acknowledging the objectives of the directives on the circular economy and defining the evolutionary scenarios of planning to 2027. It is not, therefore, a new program but an update of the current one. It was considered that the results of the LCA study conducted for the current (in force) program were still valid and that it still offer useful and valuable information for the updating of the current program.

How do you reconcile the necessity to popularise pro-environmental implementations with restrictions on technological patents. Is it considered to speak analogically about the Patent Life Cycle - i.e. when a pro-environmental technology is really groundbreaking and effective? Can the regional and/or central authorities subsidise its shortening - LC (if the superior good is the environmental benefit demonstrated e.g. by LCA studies)?

> Ideally speaking, the role of the public authority could be to make it easier to access innovation, in particular when the "open" availability of innovation can be disruptive for sustainability issues. Yet, we saw how the issue is hard, for instance regarding one of the most strategic current topics: the vaccines. So, this can be a pathway to explore, but it will not be easy at all.

Lombardy is one of the most important industrial centers in Europe (including heavy industry - which cannot rely solely on RES (Renewable Energy Sources) due to their instability). With LCA and energy as the basis of virtually every product, is there a plan to move to zero / low carbon energy sources (hydrogen / renewable energy / nuclear)?

> The Lombardy Region is trying to plan how to address the international targets, of course through the sectorial policy instruments, first of all the Energy, Environment, Climate regional Programme, which is currently under the SEA (Strategic Environmental

Assessment) procedure. Then, the new ERDF-ROP 21-27 (under SEA as well) will also contribute to steer the region toward the climate goals: one of the specific actions will be to support the improvement of the energy performances of building and companies, to support RES and circular economy. The latter can often be a good tool for climate change mitigation. Then, the whole ERDF-ROP itself, according to the EU legislation, must support, with all its actions, the climate target. Other policies, such as the new Common Agricultural Policy, will also help to reach this target, and the National Recovery and Resilience Plan (NRRP) can support action for climate. Moving more concretely to energy sources, the Lombardy region already provides the 25% of national hydropower energy. This source is almost completely exploited in the region. Wind is not an option in Lombardy for different reasons. Therefore, we intend to boost solar energy, biomass energy, heat pump systems, bioenergy. The NRRP also foresees support for producing green hydrogen, which will most likely be produced through solar energy.

Regarding your LCA experience, are the experiences represented by the Good Practices on municipal solid waste and construction and demolition waste also implemented (or something similar) by other regions in Italy? What is the average cost of preparation of such a large LCA analysis, e.g. for the municipal solid waste management system?

There are other regions which applied LC to support their Waste management programme. An ongoing study run by the Italian LCA Network Association (presented in the first day of the meeting) is exploring this aspect. The results of this study will be shared with the partners as soon as they will be available. Concerning the costs, they depends on the complexity of the system to be analyzed and the availability of data to run the study. It can be some tens of thousand euros.

Does Lombardy's "Regional Strategy for Sustainable Development" make direct reference to the LCA? or is it rather indirectly related to this issue?

The Strategy, in the chapter dedicated to Circular Economy and sustainable production models, identifies some LC based methodologies as key tools (e.g. product environmental footprint, life cycle analysis, organisation environmental footprint). The life cycle thinking also permeates the chapter on sustainable consumption models for citizens and public authorities, and of course the whole section on circular economy.

STUDY VISIT

This TLJ included a study visit, in the evening of the second day, to the Milano Food Hub.

The City of Milan has won the first edition of the international award “Earthshot prize” for the best solutions to protect the environment: the "hub di quartiere" (neighborhood hubs) food policy project to prevent food waste.

Partners visited one of them: the Food hub Isola.

They also could try the Refettorio Ambrosiano, an initiative where people in need can find free meals every day, prepared with unsold food collected from large-scale retailers.

To know more about the Refettorio Ambrosiano: https://refettorioambrosiano.it/

TLJ #6 Lessons learnt

After five TLJs and the identification of already over 57 Good Practices, partners had no doubt that LCA tools are well spread. Furthermore, an overview conducted ahead of the TLJ showed that there are excellent local cases of applying LCA tools to specific segment of local policies, mainly in green public procurement and waste management plans. One of the questions left unanswered was how to give a broader scope to life cycle thinking and life cycle analysis in the context of circular economy and sustainable development and how to integrate it to all the stages of policymaking, in particular monitoring and evaluation. Thus, the different presentations and discussions of this TLJ helped understanding if the integration of LCA in monitoring frameworks could facilitate and increase the efficiency of the whole process.

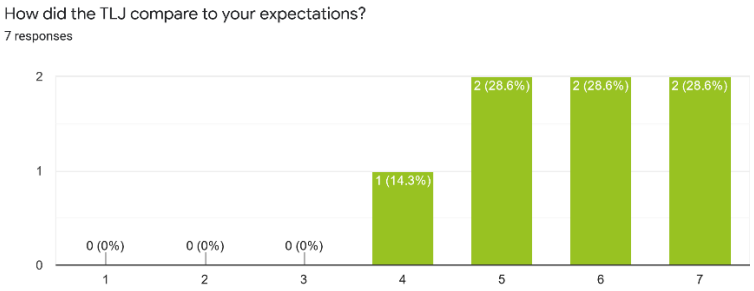
The answer for the LCA4Regions partners is positive, the integration of LCA wider methodologies to monitor local circular economy and sustainable development strategies is a promising path. This is why, they recommend exploring further the benefits of using LCA to support the development of a system of indicators not only based on materials and waste production but also taking into consideration the multi-dimensional aspect of circular economy and able to detect crosscutting effect of policies and activities. Examples presented during the TLJ illustrated that potential applications vary from improving sustainable consumption to the promotion of an increased integration of different local policies (environmental, innovation strategies, circular economy,...).

A practice caught the attention of a partner and could be part of its Action Plan, namely “An ongoing research: LCA in the Waste management Regional Programme of Italian regions”. Having on the field study visit, with both the dinner and the food bank, also proved a success since one partner is considering integrating these systems to its Action Plan. Other practices that were relevant are: the goals of the SDG, assessment of the efficiency and environmental effects of the

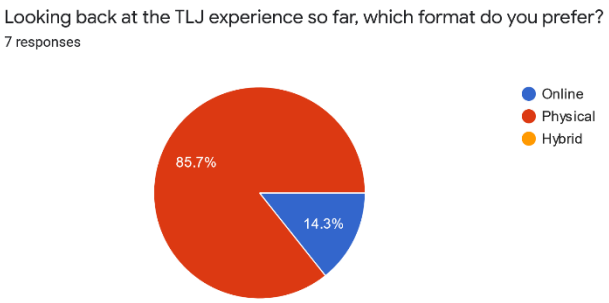
use of geothermal energy; Product Environmental Footprint (PEF), Proprietary Product Assessment and Eco-labeling Programs (Made Green in Italy), Integrated Plan for Circular and Sustainable City Development (on the example of the city of Genoa).

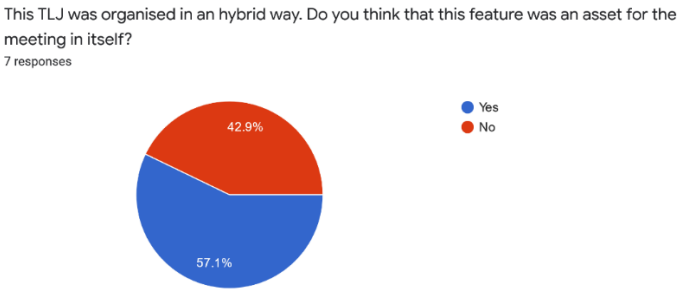
Participants' feedback

In general, participants evaluate very positively the TLJ. They appreciated the fact that the TLJ was organised in an hybrid way, with the possibility to participate physically since it enriched the experience and resulted in a more fruitful meeting. If some participants did not see improvements compared to previous TLJs, others highlighted in a positive way the fact that some variations, e.g. panel discussions, were brought and found it a balanced meeting, comparable to other meetings. The fact that participants had the opportunity to ask questions on the policy context of the Lombardy Region before the TLJ was very much weclome.



This being said, it is not sure if hybrid events are the way forward as participants are quite shared on the asset of having this type of meetings (short majority for positive). In general, participants prefer physical only meetings.

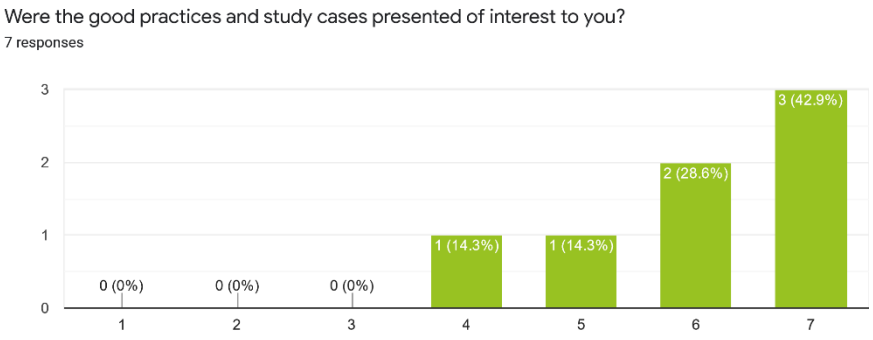




This point of discussion is particularly interesting in the current context of uncertainty when it comes to physical events. Participants value the flexibility given by the possibility of still attending the meeting when physical travel is not possible. However, they all insist on the benefits brought by

in person discussions since it is easier to exchange ideas, network, have deeper analysis of problems emerging between partners, organise real study visit. In addition, it seems that it is not easy to link the two types of audience, with in situ participants having issues to follow online presentations and discussions being less dynamic. Thus, it might be easier when all participants are attending either all in person or all online the meeting.

Regarding the content, participants declared in majority that the good practices and study cases presented were relevant. A participant declared that the social aspects of the topic were well addressed. In general, and with adaptation to the local context, some practices could be transfered, for example the ones related to the use of LC tool for waste management. One participant noted that the highly industrialized economy of the region has a significant impact on the environment and is an extremely interesting basis for the implementation of circular economy mechanisms. Thus, the experiences of Lombardy seems to be very valuable, in particular related to similar challenges identified in the field of, inter alia, the agri-food sector, textiles and fashion, as well as air protection.



Regarding the peer review, participants valued the good preparation made ahead of the session and the quality of the content of the session. It can thus be concluded that the recommendations made during the previous TLJ were useful. One participant particularly appreciated the analyse of the use of LC tools both in existing and in future policy instruments. However, the hybrid meeting system made the feedback somehow chaotic. Thus, building on this experience, participants recommend for the final peer review session to

continue with a strong preparation work ahead and to organise on the day small groups or workshops to allow to go more in depth in the comments and feedback.

Stakeholders' involvement has always been complicated for the TLJs. It is important that stakeholders present their own Good Practices and it also gives them the opportunity to hear from other Good Practices that can be relevant for them. It seems that this TLJ makes no exception, with a satisfactory level of involvment of stakeholders.

There is now only one TLJ left before the LCA4Regions closes this part of its work. Since the scope is different from previous TLJ, focusing this time on Action Plans, the meeting has to be tackled differently with an adaptation of the Agenda. Partners will therefore have to make sure that enough time is dedicated to the presentation of the Action Plans by each region, to discuss the measures established. Other tips can still be drawn from the meeting in Lombardy. If the next TLJ is taking place online, it is recommended to organise workshops in small groups to facilitate the discussion and enable partners to focus better on small details. If the TLJ will take place face-to-face, then more options will be available. In particular, it will be possible to have longer days and more interactive sessions.

As usual, partners will share relevant information and practices discovered during this TLJ with their stakeholders. Contacts will also be taken bilaterally with the Lombardy Region to gather deeper information (e.g. on the use of social LCA applied to waste management)

And to finish, if to chose one word to define the TLJ it would be **CHALLENGING**. Participants also associated this TLJ to "**interesting**", "**excellent**" and "**constructive**".

View from the host

Lombardy Region promotes the use of LCA to support enhanced sustainability policies

The Life Cycle Approach can turn out to be a powerful tool to encourage sustainability. And the Lombardy Region is in the forefront of promoting it in Italy's public sector, as a partner of the Interreg Europe LCA4Regions project. As of today, the project has identified some 57 good practices, especially in Green Public Procurement (GPP) and waste management. From 22 to 24 November, Milan hosted the project's first in-person conference after almost two years of online meetings only.

The Milan meeting showcased several Italian experiences. Rina Consulting explained how analysing the lifecycle of geothermal power stations can help optimising their performance while offering clear, useful hints to define sector policies. The Italian LCA Network Association, that promotes the Life Cycle Assessment approach, presented its activities together with the first findings of an ongoing study, aimed at understanding to which extent and in which way the LCA approach is applied in regional waste management programmes. Finally, the Sant'Anna School of Advanced Studies presented the "Made Green in Italy" initiative: by computing the environmental footprint of several products, and agri-food products in particular, the base was established to develop a promotion programme for a labelling system endorsing the environmental value of Made in Italy products. The system is expected to help enhancing trust between consumers and producers and promote a more sustainable consumption style. The Lombardy Region is currently assessing ways to incorporate this initiative into its own regional policies.

The meeting also represented a pre-event to the second Regional Forum for Sustainable Development. On the one hand, the discussions held confirmed regions play a key role in spreading sustainability, both at the research and innovation level, and in specific industries – such as furniture,

design, agri-food and nutrition, textile, fashion and beauty, tourism – and up to territorial governance (urban and territorial regeneration, sustainable mobility). On the other hand, it highlighted how the journey toward sustainability requires a constant commitment, empowering the dialogue among all the players, from institutions to corporate world and research. A major role along this journey is played by the local implementation of the SDGs, the sustainable development goals outlined in the United Nations' Agenda 2030, which the Lombardy Region has developed and detailed into its own Regional Strategy of Sustainable Development.

Therefore, the Life Cycle Approach can present itself as a useful tool to support the overall sustainability journey, as confirmed by the interest raised by this TLJ#6 in the Italian media. You can have a look at the following selection of Italian news outlets that reported on the event:

- Lombardy Region promotes the life cycle approach for sustainablity – Parole Di Management, 18/01/2022
- A project to push sustainability in Lombardy with the LCA – Green Planner Magazine, 18/01/2022
- Lombardy Region promotes the use of LCA to support policies for greater sustainability – Informazione.it, 18/01/2022
- Lombardy Region promotes the use of LCA to support policies for greater sustainability – Comunicati-stampa.net, 19/01/2022
- Lombardy Region promotes the use of LCA to support policies for greater sustainability – Notiziabile, 18/01/2022

Conclusion

This TLJ has been important for the LCA4Regions as finally a possibility to meet in person. It is a proof that no matter how well organised an online TLJ is, there will always be something missing that only a physical event can bring. This can at the level of interactivity and discussion between partners but also for the study visits. Despite the complexity of the topic tackled, the Lombardy Region managed to offer an interesting meeting rich of learning and note-worth experiences.

The TLJ had an impact not only on the partners and their stakeholders but also externally. It caught the attention of several local media and thus contributed to spreading the life-cycle thinking and increased local – non-specialised – audience awareness of the life cycle approach.

With the last exploration of Good Practices, this TLJ is closing one chapter of the LCA4Regions Journey, anticipation of the end of the Interregional Learning Phase of the project. The library of Good Practices now counts with 57 examples of LCA.

Last but not least, this TLJ, with its session on the Action Plans, is a smooth transition towards the next TLJ that will be entirely focused on Action Plans and thus be a real bridge towards the second phase of the project.

The next TLJ, focused on the Action Plans, will take place in February 2022, organised by CIMBAL, the Baixo Alentejo Intermunicipal Community (PT).