



Tetis Institute Srl

TEchniques for The Impact on Sustainability
Spin Off of the University of Genoa

Document details

Title	LCA Technical Report Summary
Subtitle	Study for the evaluation of the potential environmental impacts linked to the restoration, safety, cleaning and painting of facades through EdiliziAcrobatica.
Project	.
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Author	Tetis Institute Srl, Spin Off of the University of Genoa
Client	EdiliziAcrobatica



EDILIZIACROBATICA



I – The company

EdiliziAcrobatica is the leading company in Italy and Europe in the double safety rope operating construction sector.

Thanks to his innovative technique, which originates from climbing techniques, he is able to carry out renovation works, commissioning safety, painting and much more, quickly and with an absolutely sustainable method. Choose EdiliziAcrobatica services means ensuring your home has maximum excellence, safety and speed of completion: we don't use scaffolding and so we don't even need to dedicate days of work to assembling them.

II – The service

Based on its experience, EdiliziAcrobatica has identified the following types of intervention as particularly strategic:

- Securing;
- Restoration;
- Cleaning;
- Painting.

III – Lo studio Life Cycle Assessment

In 2021, EdiliziAcrobatica decides to prepare an LCA (Life Cycle Assessment) study of its main services to make a comparison with similar activities carried out through traditional construction.

The study was conducted by **Tetis Institute Srl, Spin Off of the University of Genoa.**

IV – Methodology used

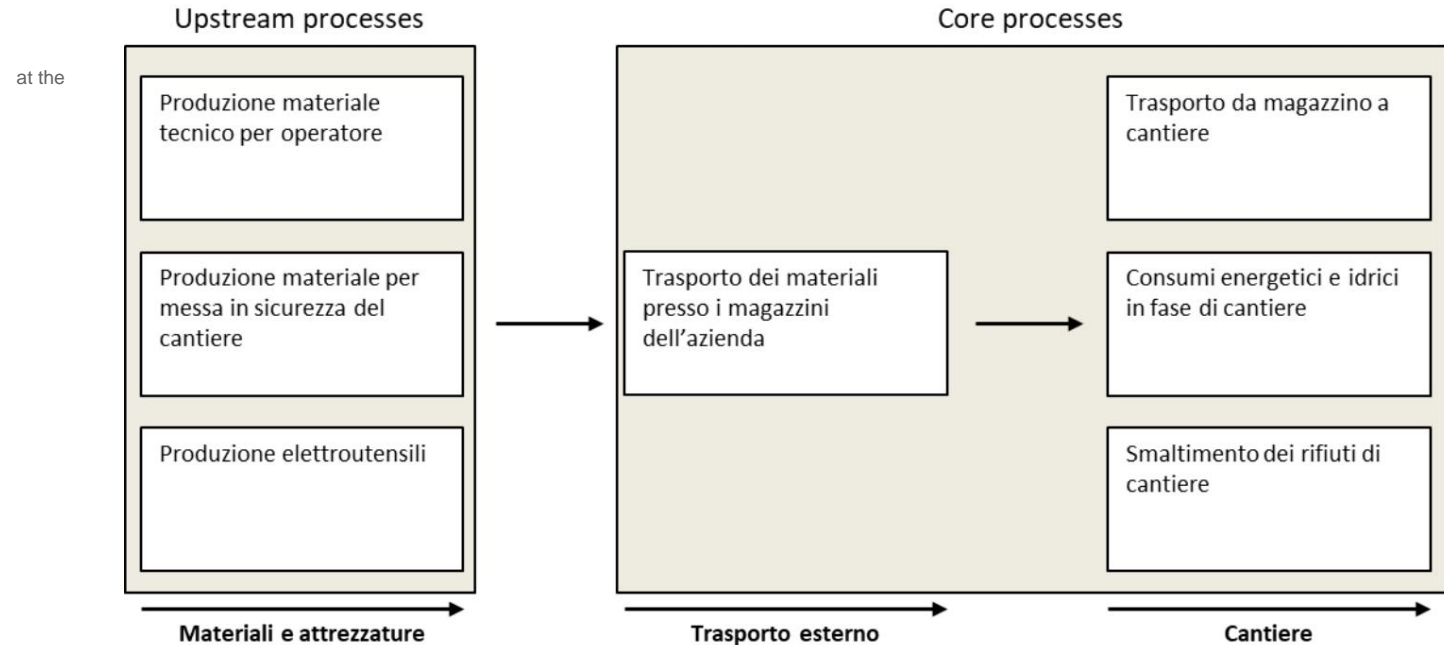
The **objective of the study** is the evaluation of potential related environmental impacts realization of various interventions on the facade via rope operators.

The **methodology** used for quantification of environmental performance is Life Cycle Assessment (LCA), regulated by ISO 14040-14044 standards.

The **impact categories** considered are: following:

- Global Warming Potential, (GWP)
- Water consumption, (Water)
- Cumulative Energy Demand, (CED)

The **functional unit** is represented by 100 m² of intervention surface.



The **activity** involves operators carrying out construction work without the use of scaffolding or aerial platforms using the double safety rope technique.

The **boundaries of the system** on which the complete study was carried out are represented in figure.

Since this is a comparative study, it is possible to exclude from the comparison the phases common to the compared processes (production of raw materials used in the facade).

V - Results of the study

The application of the LCA methodology for the analysis of safety, restoration, cleaning and painting activities made it possible to evaluate the potential environmental impacts of the process along the various phases with a view to process optimization and credible communication of information environmental (yellow histogram).

The study highlighted how **the environmental performance of the EdiliziAcrobatica service allows a reduction to be achieved of the environmental footprint** compared to traditional construction in each of the 4 activities analysed.

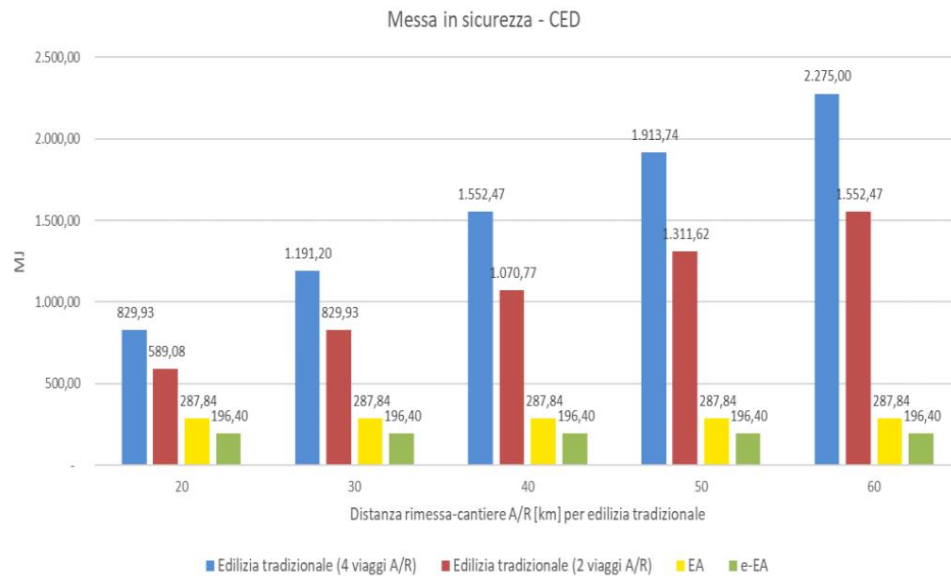
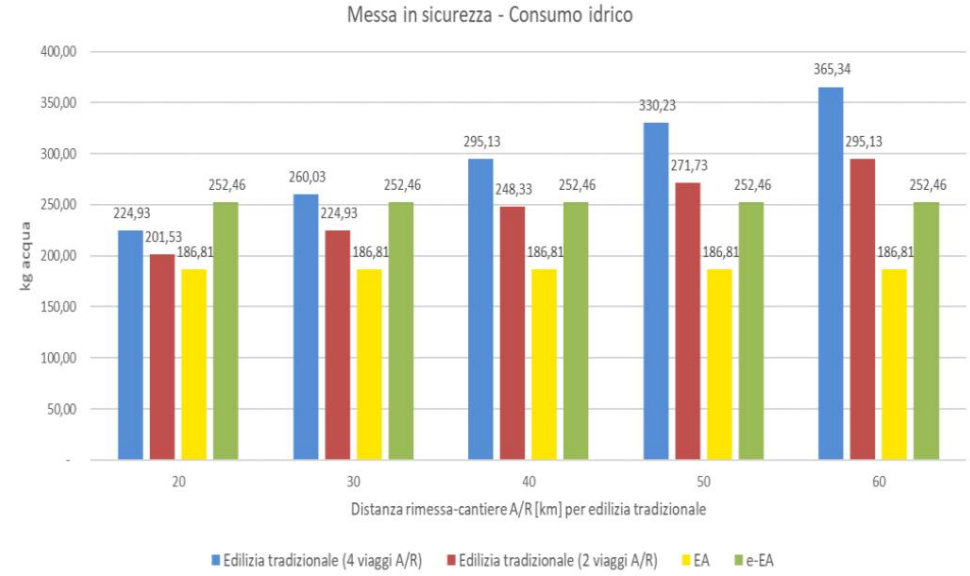
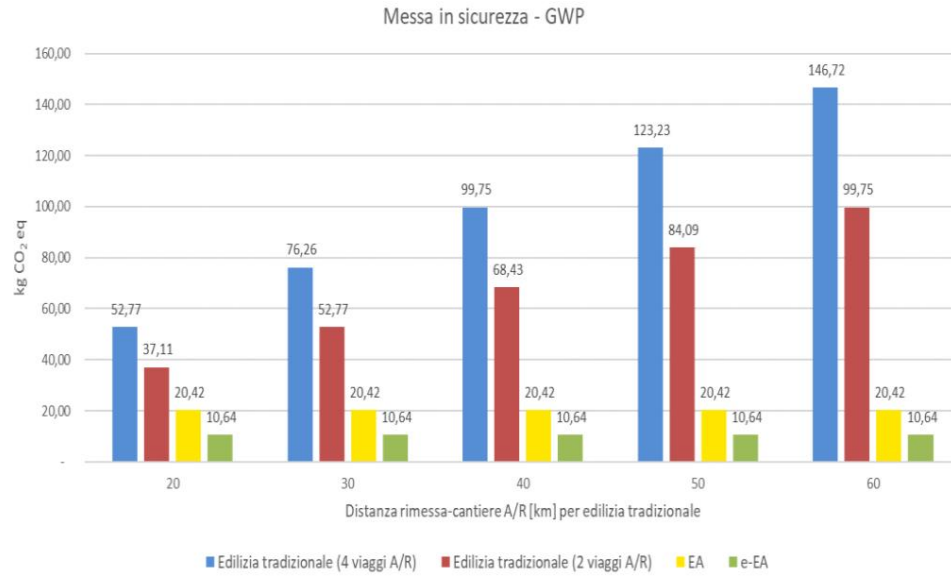
As indicated below, the results of EdiliziAcrobatica were compared with various traditional building scenarios where the following are hypothesized:

- A different number of return trips for assembling and dismantling the scaffolding ÿ scenario with 4 trips (blue histogram) and scenario with 2 trips (red histogram)
- A different distance between the warehouse and the construction site for the return trip ÿ as per the abscissa, the kilometric data varies between the 20 km assumed for ConstructionAcrobatics up to a maximum of 60 km

The comments on the graphs are reported on the basis of the comparison with the same distance between the warehouse and the construction site (20 km return), which represents the minimum percentage advantage achievable thanks to the use of double safety rope operational construction.

For comparative purposes, the environmental results expected with the replacement of current diesel vehicles with similar electric vehicles are also reported (green histogram). This solution presents worsening results regarding water consumption due to the greater consumption of electricity (water consumption from hydroelectric production is accounted for).

V - Results of the study - Safety measures



GWP

- Between 45% and 61% reduction in global warming potential (GWP) through reduced travel

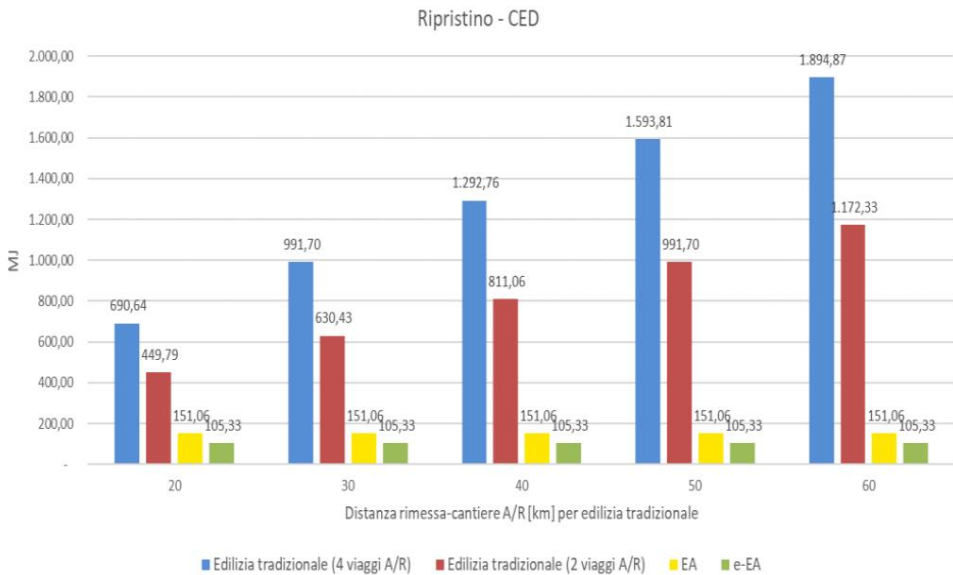
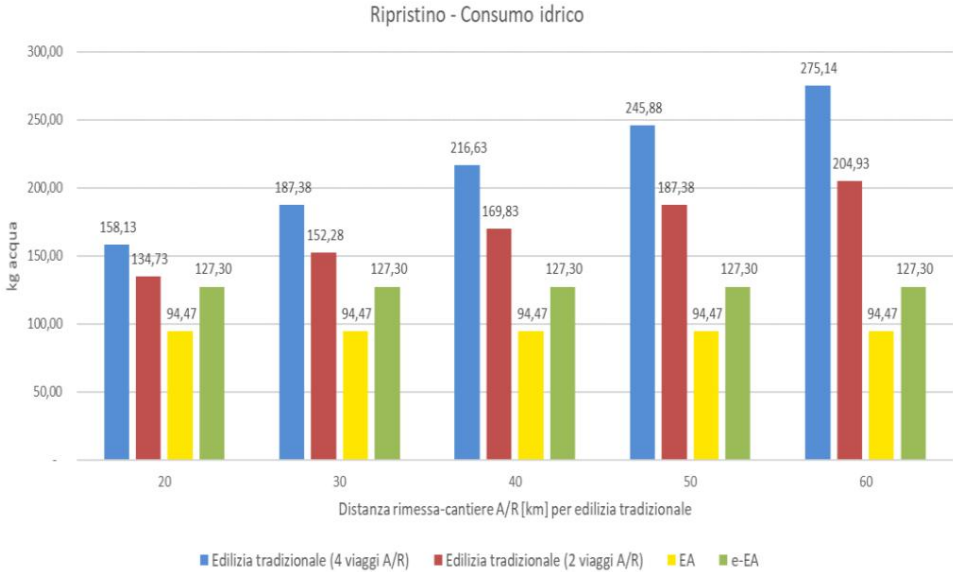
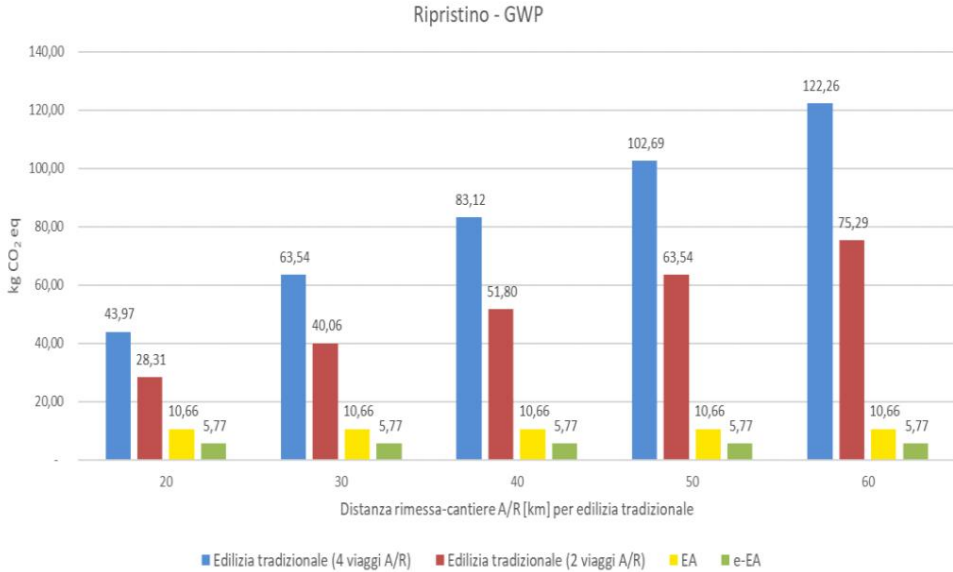
CED

- Reduction between 51% and 65% in consumption energy (CED) through the reduced number of trips

Water

- Reduction between 7% and 17% of net water consumption through the reduced number of trips

V - Results of the study – Recovery



GWP

- Between 62% and 76% reduction in global warming potential (GWP) through reduced travel

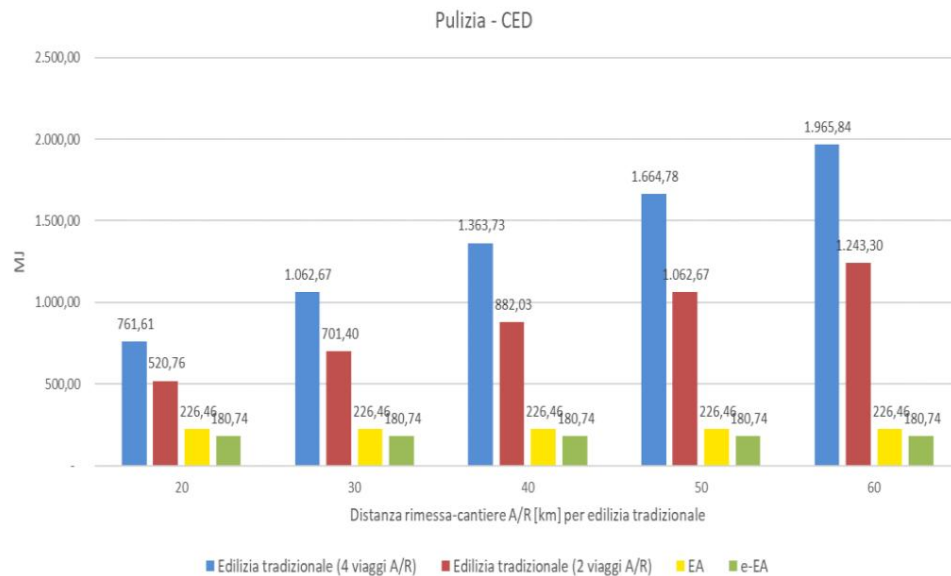
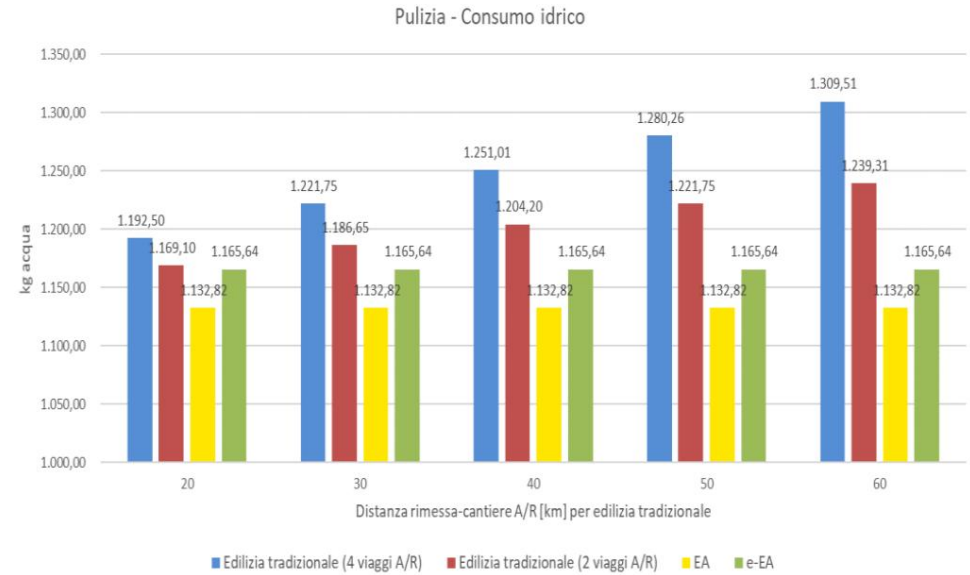
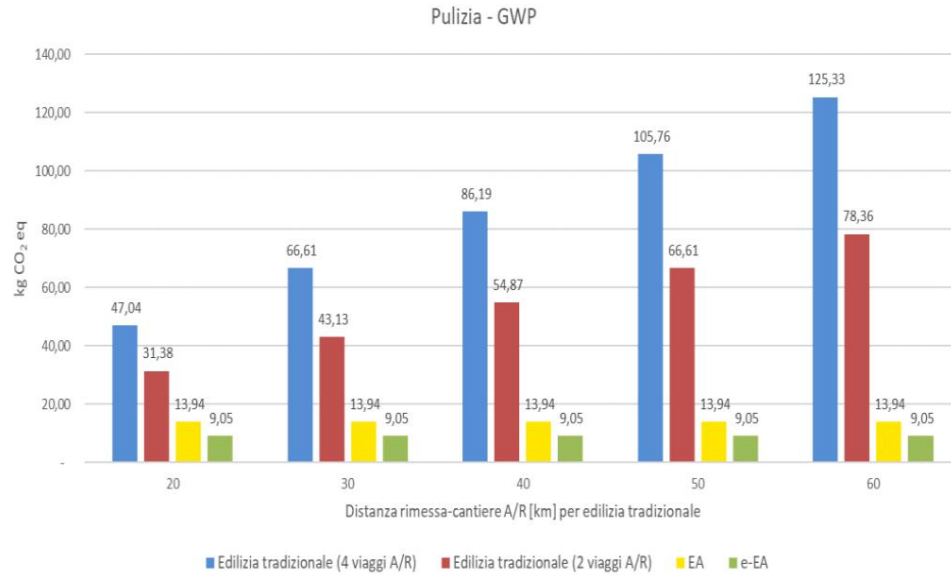
CED

- Reduction between 66% and 78% in consumption energy (CED) through the reduced number of trips

Water

- Reduction between 30% and 40% of net water consumption through the reduced number of trips

V - Results of the study – Cleaning



GWP

- Between 56% and 70% reduction in global warming potential (GWP) through reduced travel

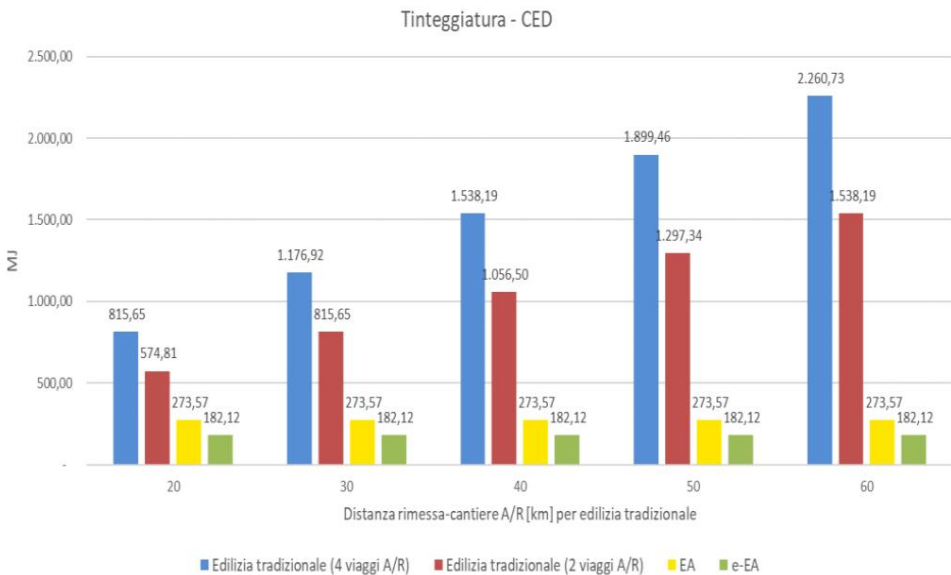
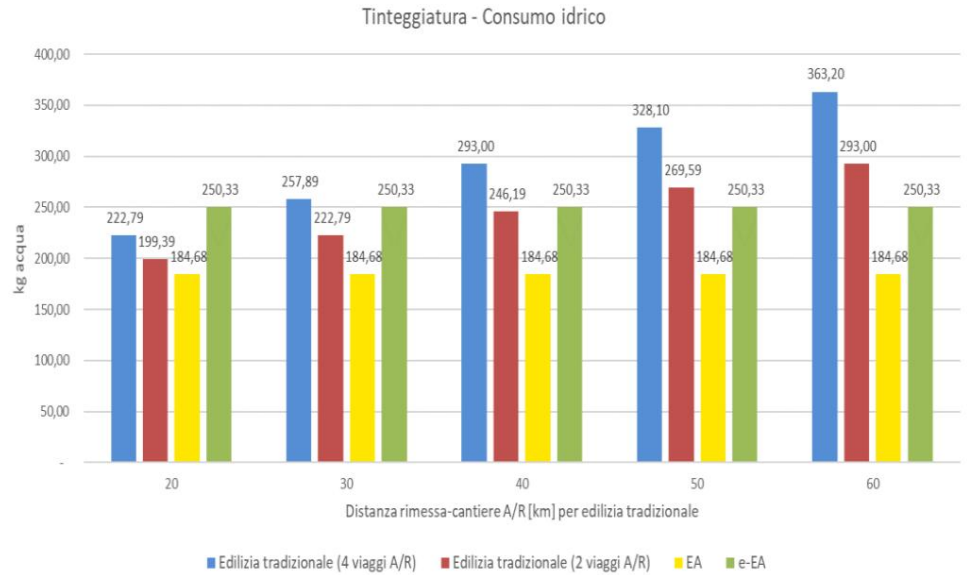
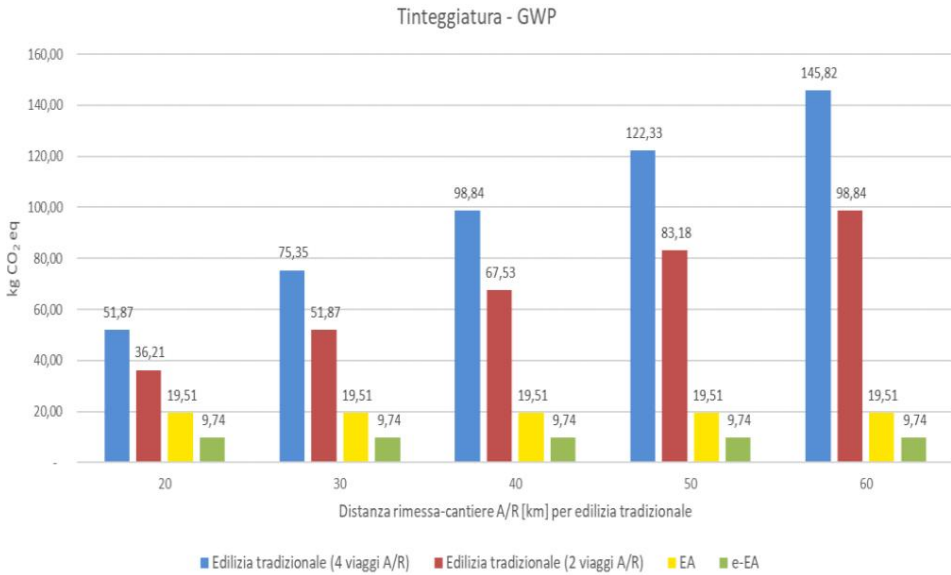
CED

- Reduction between 57% and 70% in consumption energy (CED) through the reduced number of trips

Water

- Reduction between 3% and 5% of net water consumption through the reduced number of trips

V - Results of the study – Painting



GWP

- Between 46% and 62% reduction in global warming potential (GWP) through reduced travel

CED

- Reduction between 52% and 66% in consumption energy (CED) through the reduced number of trips

Water

- Reduction between 7% and 17% of net water consumption through the reduced number of trips

References

ISO 14040:2021 Environmental management — Life cycle assessment — Principles and framework

ISO 14044:2021 Environmental management — Life cycle assessment — Requirements and guidelines

Database Ecoinvent v.3.5 (www.ecoinvent.org)

LCA Study “Study for the evaluation of potential environmental impacts linked to the restoration, safety, cleaning and painting of facades through EdiliziAcrobatica” Rev.1.0 – Created by Tetis Institute Srl, Spin Off of the University of Genoa, for EdiliziAcrobatica.

Glossary

LIFE CYCLE ASSESSMENT (LCA): is a methodology regulated by ISO 14040-44 standards which aims to quantify the energy and environmental load of the life cycle of a product or activity, through the quantification of the energy and materials used and emissions (solid, liquid and gaseous) released into the environment, from the extraction of raw materials to the disposal of final waste.

GLOBAL WARMING (GWP100): phenomenon of global warming of the atmosphere, calculated for the next 100 years, due to the emission into the atmosphere of greenhouse gases such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O).

WATER CONSUMPTION: indicator representing the net quantity of water consumed.

CUMULATIVE ENERGY DEMAND (CED): indicator representing the direct and indirect use of energy throughout the life cycle, including energy consumed during the extraction, production and disposal of raw and auxiliary materials.

TETIS Institute Srl

Who we are

- Tetis Institute srl was founded with the aim of providing consultancy services for companies, associations or public bodies, national and international organizations and institutions.
- The company was established in March 2018 and was recognized in advance as a Spin-off of the University of Genoa in February of the same year.
- The founders are professors of chemical and process engineering and environmental engineering with great experience in the environmental and social sustainability of the Genoese University.
- Tetis Institute srl has great experience in sustainability that boasts its roots in Inter-university center for the development of product sustainability (CESISP), which involves professors and researchers expert in sustainability, circular economy and process engineering

Skills

TETIS has the following capabilities and experiences:

- Return on investment and impact assessment (private companies and public administrations)
- Mitigation actions and climate plans (participation in UN Conferences of the Parties on Change Climatic; Plans of 5 cities)
- Inventory of greenhouse gas emissions (EXPO Milan 2015, Cortina2021, Campus, Public Administrations, more than 500 EU-ETS establishments, 20 CDM projects, management of the eCO2care voluntary carbon credit register VER Registry)
- Ecological labels (drafting of over 50 EPDs, 20 PCRs, participation in the System's Technical Committee International EPD®)

Services

TETIS provides consultancy for both public and private clients in the field of sustainability:

- life cycle analysis • Carbon footprint • Water footprint impact assessment management
- of greenhouse gas emissions
- eco-design eco-labels
- circular economy

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