Ladurner Ambiente Spa, with its subsidiaries, is one of the leading company in the environmental sector in Italy, which builds and manages solid and liquid waste treatment systems and produces renewable energy from solid and liquid waste and agricultural biomass. Ladurner Ambiente Spa is also active in the sector of municipal and industrial waste water treatment, reclamation of contaminated sites, and specialized environmental consulting. Founded in 1990 Ladurner now offers all-around solutions in the environmental field and in renewable energy production.
OUR ACTIVITY

WASTE
— RDF-SRF Biostabilisation and composting plants
— Anaerobic plants for Biogas production
— Waste to energy plants
— Waste processing machines
— Management of waste treatment plants

WATER
— Civil and industrial WWTP
— Flat sheet membranes for microfiltering
— Sludge driers
— UV disinfection plants
— Mixing and aeration systems
— Sludge disintegration plants
— Lifting systems

WASTE TO ENERGY
— Energy recovery from renewable sources (waste)

AGRO-ENERGY
— Production of electricity from renewable agricultural sources

RECLAMATIONS
— Contaminated land reclamation
— Treatment plants for hazardous and non-hazardous special waste
— Reclamation of property and land containing asbestos
— Risk analysis and characterization plans
— Lab analysis
— Environmental monitoring

CONSULTING SERVICES
— Environmental communication
— Design of waste collection systems
— Environmental certifications
— Waste compositional analysis
— Consulting services for the implementation of PAYT fees
— Awareness raising campaigns
— Life style projects for sustainable living

SOLAR ENERGY
— Industrial-scale photovoltaic plants; turnkey “EPC CONTRACTOR”
— Asset Management
— Technical Due Diligence
— Operation and Maintenance

ENERGY EFFICIENCY
— Energy efficiency and technological modernization projects of new or existing plants
— Led signal lighting in sea/port channels
HOW WE WORK

WE DESIGN

WE INVEST

WE BUILD

WE MANAGE
<table>
<thead>
<tr>
<th>OUR MAIN FIGURES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnover</td>
<td>€ 70 MLN</td>
</tr>
<tr>
<td>Staff</td>
<td>210</td>
</tr>
<tr>
<td>Installed green power</td>
<td>100 Mw</td>
</tr>
<tr>
<td>Municipal waste processed annually</td>
<td>1,000,000 ton</td>
</tr>
<tr>
<td>Reclaimed contaminated land</td>
<td>600,000 m³ 1,000,000 ton</td>
</tr>
<tr>
<td>Water treated with our machines</td>
<td>over 10 MLN m³</td>
</tr>
</tbody>
</table>
Changsha Zoomlion 57%
Ladurner Capital Partners 22.5%
Mandarin Capital Partners II 18%
EcoPartner 2.5%

Changsha Zoomlion Limited Liability Company for Science and Technology Environmental Industry Co. Ltd ............ 57.0%
Ladurner Capital Partners ................................................................. 22.5%
Mandarin Capital Partners II S.C.A. SICAR ........................................ 18.0%
EcoPartner ................................................................................. 2.5%
MANAGEMENT

Lukas Ladurner  
President

Andrea Silvestri  
CEO

Lorenz San Nicolò  
Division Manager for Reclamation  
Long international experience in characterization and reclamation of contaminated sites, environmental and health threat analysis, applied hydrogeology and numerical modelling of groundwater flow.

Burkhard Klotz  
Division Manager for WTE plants  
Long international experience in the design and management of WTE and WWTP. Experience in the implementation of large-scale complex plants and in-depth knowledge of new technologies applied in the energy and waste sector.

Gianni Gallozzi  
Head of the Operations and Maintenance Division  
Long experience in the operation and maintenance of waste to energy plants, proven experience in the design of installations for the treatment of municipal and industrial solid waste and in the field of alternative fuels.

Bruno Abram  
SPV Waste to Energy Division Manager  
Long experience in the administrative, commercial and strategic marketing management of SPVs and joint ventures in the environmental and waste to energy sector. Long experience in financial controlling for major Italian industrial groups.

Andrea Miorandi  
Division Manager for Energy Efficiency and Environmental Consulting Services  
Long experience in environmental consulting services and in the design and implementation of waste collection systems and environmental communication.

Matteo Grandi  
SPV Farm-to-energy Division Manager  
Long experience in the administrative, commercial and strategic marketing management of companies and joint ventures in the Farm to-energy sector.

Simone Paoli  
Head of the China Operations Division  
Long experience in the strategic development (technical, administrative, financial) of projects in the environmental sector, and in-depth knowledge of new technologies applied in the waste and energy sector.

BOARD

AREA SCIENCE & TECHNOLOGY

AREA OPERATIONS

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THE HISTORY OF OUR DEVELOPMENT AND GROWTH

1990
ENVIRONMENTAL WORK
The group’s environmental work begins with the spin-off of the activities involving the implementation and management of WWTP.

1992
DEPURATION AND TREATMENT OF WASTE
The first WWTP is implemented and the development of solid waste treatment activities begins.

1993
ENVIRONMENTAL RECLAMATIONS AND LABORATORY
The environmental reclamation and laboratory analysis work begin.

1997
SHAREHOLDING
Ladurner acquires the control of the company Ecoproject, its first special purpose vehicle in the field of waste management.

1998
COMPOSING PLANTS
The construction and management of composting facilities in Mira (Veneto) begins with the first SPV.

2000
ENVIRONMENTAL CONSULTING SERVICES AND COMMUNICATIONS
The environmental consulting services and communication activities begin.

2001
RDF PRODUCTION PLANT
The construction and management of plants producing RDF begins in Fusina (Veneto) with an SPV.

2006
AGRICULTURAL INSTALLATIONS FOR ANAEROBIC DIGESTION
The construction and management of agricultural plants for anaerobic digestion begins with an SPV.

2007
PHOTOVOLTAIC PLANTS
The construction and management of photovoltaic plants begins.

2009
ANAEROBIC DIGESTION PLANTS FROM ORGANIC WASTE
The construction and management of anaerobic digestion plants from waste begins with an SPV.

2010
CONTAMINATE SOIL TREATMENT PLANTS
Construction and management of a treatment plant for land reclamation begins in Sinigo (Merano).

2012
ENERGY EFFICIENCY
The energy efficiency service business begins.

2015
SIGNING
On the 22nd of December 2015, Zoomlion and Mandarin Capital Partners reach an agreement to acquire 75% of the shares of Ladurner Ambiente.

2016
CLOSING
The industrial partnership between Zoomlion and Ladurner Ambiente begins.

Ladurner Ambiente begins operations in China with the birth of Ladurner China.
OUR STRATEGIC FOCUS

BIOGAS FROM WASTE
— Development of the Renerwaste project operating in energy recovery from renewable sources (waste).

RDF-SRF
— Know-how in the production, management and marketing of fuels derived from waste (RDF-SRF) with extensive experience in co-firing with fossil fuels.

B.O.T.
— Optimization of EPC through the sale of non-strategic assets on the market after the initial deployment, according to the BOT model (build, operate and transfer).

LEADER O&M
— Strengthening of activities relating to the management and maintenance of waste treatment plants, designed to create a stable flow of income and high margins.

INTERNATIONALIZATION
— Export of know-how and appropriate technologies in the field of waste treatment and energy recovery in foreign markets.
— Target Countries: China, India, Europe, North Africa, America
Ladurner has always been committed to develop technological solutions for the environmental sector, pursuing both a “passive” (prevention) and an “active” (treatment and energy recovery) approach.

The constant search for innovation allowed Ladurner to become a leading company in the environmental sector.
OUR RESEARCH AND DEVELOPMENT ACTIVITY

INTERNATIONAL COLLABORATION AND PARTNERSHIPS
WITH HIGH TECHNICAL AND SCIENTIFIC IMPORTANCE

Ladurner’s "research and development" work, concerning the products and services it offers, has always been constant, intense and structured, as befits a group that makes technological innovation and cutting-edge solutions one of its key differentiators. **Collaborations and international partnerships** ensure that Ladurner can continuously monitor the market and the industry in all its areas of activity, from waste-to-energy to water treatment, reclamation and environmental services, since it can rely on a leading role alongside international partners from which to draw expertise and technical and scientific experience. Similarly, collaboration with technical and scientific bodies is pursued, including links to individual supply chains: for example, the CIC (composting and biogas), ISWA (GOLD MEMBER of the International Solid Waste Association), CTI (Italian Heat Technology Committee, for RDF and waste-to-energy), UNI-EN (European standards), Federambiente, etc. **Participations in Community and national projects and research agreements with universities with a strong scientific and technological value**, **internships of graduates and/or undergraduates for dissertations on the processes, development and application of B.A.T. to Italian businesses**, combined with a **top-level design team**, are additional factors supporting the research and development of Ladurner activity.

Last but not least, there is the activity of "scouting" and monitoring carried out by the technical and commercial divisions of Ladurner with the support of the consulting division.
OUR RESPONSE TO REQUIREMENTS

WE WORK ONLY WHERE WE GIVE ADDED VALUE

Ladurner is synonymous with the added value that our products and services bring to the market. Some examples:

<table>
<thead>
<tr>
<th>Sector</th>
<th>Production Chain</th>
<th>Requirement</th>
<th>Ladurner solution</th>
<th>Final Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal solid waste</td>
<td>wet organic</td>
<td>Disposal Recovery</td>
<td>Anaerobic digestion Composting</td>
<td>Biogas, Methane, Energy, Compost</td>
</tr>
<tr>
<td></td>
<td>municipal waste</td>
<td>Collection Interception</td>
<td>Design Organisation Communication</td>
<td>Separate collection</td>
</tr>
<tr>
<td>Industrial sites</td>
<td>polluted land</td>
<td>Reclamation and re-use of areas</td>
<td>Reclamation, Disposal</td>
<td>Availability of areas</td>
</tr>
<tr>
<td>Waste water</td>
<td>civil industrial</td>
<td>Depuration</td>
<td>Treatment</td>
<td>Reuse Water</td>
</tr>
<tr>
<td>Energy</td>
<td>energy (production chain)</td>
<td>Energy saving and energy efficiency</td>
<td>Streamlining energy consumption</td>
<td>Energy Evaluation</td>
</tr>
</tbody>
</table>
Ladurner Ambiente has obtained certification of its Quality Management System according to the ISO 9001 standard for all the companies within the group, creating an integrated system among the various companies. The Ladurner Ambiente Group consistently and effectively applies the Quality Management System which it has created in an integrated way to all companies belonging to the group and which has been certified according to the ISO 9001 standard.

Since the ISO 9001 certification of this system, which has been integrated among the various companies of the group, is issued by an independent "accredited" institution (non-partisan), it demonstrates the guarantee to the customer of the quality of the products and the service provided, as shown by the implementation of actions and plans aimed at the continuous improvement of its activities.

We did not limit ourselves to certifying our companies one by one, instead we wanted to create an integrated system which could optimize services and activities through their centralization, and standardize the work procedures common to all businesses, by simplifying the management of common processes and ensuring better control. Specific operating procedures outline and regulate the processes of the individual companies, thereby ensuring specificity and detail.
### SOA Qualifying the Implementation of Public Works

The SOA certification is the document issued by the SOAs, required to prove the company's ability to undertake any public contract for supply and installation with starting bid amount exceeding €150,000.00 (whether it is under contract or subcontracted). The SOA Certificate qualifies the company to execute contracts for categories of works and bid amounts, commensurate with the firm’s technical and economic capability. Therefore, it demonstrates the economic, financial and technical capability of undertaking the contract.

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>ACTIVITIES</th>
<th>CATEGORY</th>
<th>RANKING</th>
<th>CONTRACT LIMIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>waste disposal and recovery plants</td>
<td>OS14</td>
<td>VII</td>
<td>unlimited</td>
</tr>
<tr>
<td></td>
<td>electricity production plants</td>
<td>OG09</td>
<td>VII</td>
<td>up to € 15,494,000</td>
</tr>
<tr>
<td></td>
<td>WWTP plants</td>
<td>OS22</td>
<td>VII</td>
<td>up to € 15,494,000</td>
</tr>
<tr>
<td></td>
<td>reclamation and environmental protection works and plants</td>
<td>OG12</td>
<td>VI</td>
<td>up to € 10,329,000</td>
</tr>
<tr>
<td></td>
<td>reclamation and environmental protection works and plants</td>
<td>O612</td>
<td>V</td>
<td>up to € 5,165,000</td>
</tr>
</tbody>
</table>

### ANGA Italian Register of Environmental Operators

The Italian Register of Environmental Operators is the competent authority under which companies that collect and transport non-hazardous and/or hazardous waste must register. The same registration process is needed for companies that carry out reclamation of contaminated sites or property containing asbestos, and trade and broker waste.

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>ACTIVITIES</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>brokerage and trade in hazardous and non-hazardous waste</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>site reclamation</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>clearance of objects containing cement or resin bonded asbestos</td>
<td>10A</td>
</tr>
<tr>
<td></td>
<td>clearance of objects containing friable asbestos</td>
<td>10B</td>
</tr>
<tr>
<td></td>
<td>collection and transportation of hazardous waste</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>brokerage and trading of non-hazardous waste</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>site reclamation</td>
<td>9</td>
</tr>
</tbody>
</table>
WE ARE BRANCHING OUT INTO THE WORLD

1. LITHUANIA                  Vilnius
   Municipal waste treatment plant

2. ROMANIA                  Cluj
   Municipal waste treatment plant

3. INDIA                  Bathinda, Firozpur and Jalandhar
   Municipal waste treatment plant

4. VENEZUELA                Caracas
   Industrial water treatment plant

5. MEXICO                  Yucatan
   Civil water treatment plant

6. FRANCE                   Bordeaux
   Water treatment plant

7. AUSTRIA                  Innsbruck
   Water treatment plant
   Carinthia
   Waste treatment plant - anaerobic digester

8. GERMANY                  Karlsruhe
   Water treatment plant

9. CHINA                Huaian
   Waste treatment plant - anaerobic digester
CASE STUDY – OUR PLANTS ABROAD

SOLID WASTE TREATMENT PLANT (VILNIUS, LITHUANIA)

Technology: Manual sorting, mechanical treatment and biocell stabilisation
Plant capacity: 277,000 t/year of solid municipal waste
Biocells installed: 16
Year opened: 2015

SOLID WASTE TREATMENT PLANT (CLUJ, ROMANIA)

Technology: Technology for the mechanical processing of unsorted waste with 20 biostabilisation lines for organic-rich waste

INDUSTRIAL WATER TREATMENT PLANT (VENEZUELA)

Technology: Depuration plant for a major dairy factory on the outskirts of Caracas

WASTE TREATMENT PLANT (HUAIAN, CHINA)

Technology: Waste treatment – anaerobic digestion plant

WATER TREATMENT PLANT (BORDEAUX, FRANCE)

Technology: Depuration plant for a food production company
Ladurner has always seen waste as an energy resource. For this reason, it has developed technical know-how and highly qualified personnel which it has successfully translated into investments to search for technological and innovative solutions.

Ladurner’s Waste and Energy sector is part of all the stages of the life of a plant that recovers energy from waste, from the design to the construction and management, providing concrete answers to all requirements.

We ensure maximum efficiency for the management of the organic fraction with the combination of anaerobic technology for biogas production and the generation of electric and thermal energy and aerobic technology or treatment of the material through an accelerated composting process, with the production of agricultural improvers. The combination of Digestion, Cogeneration and Composting is Ladurner’s comprehensive answer to the treatment of the organic fraction, in the form of agricultural biomass as well.

In the solutions for the residual waste fraction, Ladurner guarantees its long experience in biooxidation technology for the production of quality fuel from waste (SRF), for which we have the most advanced technology in Italy with plants that have been tested and operating for many years. The range of technical solutions is completed by waste-to-energy technology for the incineration of RDF and residual waste.
SKILLS AND OUTSTANDING FEATURES

Technical: long years of experience.
Structural: diverse project team with specific knowledge of various technologies and focus on the research and development stage application of the best project management techniques and rationalisation of internal dynamics.
Organisational: the continuous quest for excellence
Outstanding features: the continuous quest for excellence
Technological partners: international
The environment comes first: focus on the environmental implications of the projects which are developed and the quest for low-impact solutions.

ACTIVITIES

- Revamping of existing plants and implementation of cutting-edge energy recovery solutions.
- Commercialisation of machinery for the treatment of waste and renewable energy.
LADURNER IN WASTE TO ENERGY  In the area of waste treatment and renewable energy, Ladurner operates in the sector of design and construction of waste treatment plants, from aerobic biostabilisation (composting) or anaerobic digestion of the organic fraction to the treatment of unsorted or dry residual waste (RDF production, refuse derived fuel) to waste to energy using both RDF and waste as fuel.
CASE STUDY – OUR PLANTS IN ITALY

PRODUCTION PLANTS
RDF VENICE
WITH ENERGY RECOVERY
ENEL POWER PLANT
(VENICE)

COGENERATION
PLANT
CASTENEDOLO
LANDFILL
(BRESCHIA)

ANAEROBIC DIGESTION
AND COMPOSTING PLANT
(MILAN)

RDF PRODUCTION
PLANT
(LA SPEZIA)

WASTE TO ENERGY
PLANT
(BOLZANO)

Technology:
bio-cell biodrying
Plant production rate:
250,00 tonnes/year
Bio-cells installed:
25+8
Year started:
2001 (first part),
2010 (second part)

Technology:
cogeneration units fueled by
landfill biogas
Starting year: 2005
MW installed: 2,4

Technology:
Ladurner accelerated
biodxidation
Plant production rate:
42,000 tonnes/year
Revamping plant with the
capacity of 67,500 tonnes/
year
Bio-cells installed: 5/6
Starting year: 2013

Technology:
accelerated biodrying
and production of RDF
Input capacity:
80,000 tonnes/year
Starting year: 2008

Technology:
gird furnace
Input capacity:
130,000 tonnes/year
Implemented in
collaboration with other
sector-based companies
Starting year: 2008
The element of water, even more than waste, has posed a problem, since the beginning of the 1990s, for which Ladurner has had to find an answer with the design and construction of WWTP and the supply of machinery for civil and industrial water treatment, making a decisive contribution to the development of technological solutions in the field of waste water purification.

This important experience led to even more ambitious goals which are still part of the Ladurner’s corporate policy today: to look for the best environmental technology, specifically for the treatment of waste water, to introduce and distribute as a way to consolidate its acknowledged position as a specialist in the waste water treatment industry in Italy.
Ladurner has an experienced team of engineers specialised in water treatment who, in collaboration with numerous international partners, develop technological solutions for our customers’ different requirements. Ladurner offers international technological solutions (Japan, Canada, Holland, Germany, Austria, Switzerland…) by making use of cutting-edge, global know-how.

Among Ladurner’s clients there are major companies, both in Italy and abroad. Most of the Italian multi-utility companies (ACEA, HERA, VERITAS, ENIA, IRIDE, APS-ACEGAS, etc.) The most important industries (wine producers, dairies, paper mills, pharmaceutical and chemical companies, etc.) BARILLA, CONSERVE ITALIA, PARMALAT-LACTALIS.

Design and construction of WWTP and sludge treatment plants

Design and construction of plants for energy recovery of waste water and sludge

Commercialisation of technology and machinery for waste water treatment
CASE STUDY – OUR PLANTS IN ITALY

12-year concession to dispose of approx. 18,000 tonnes/year of sludge produced from a WWTP in the Province of Trento. The treatment allows for the recovery of inert material (technosand) and biogas which is converted into electricity.

UASB anaerobic digestion plant for the treatment of 400 m³/day of industrial waste water with biogas production (and as a result, electricity) and subsequent depuration using a membrane treatment system.

Revamping of the GENZANO and PALMAROLA WWTP using MBR technology for the treatment of civil waste water (approx. 80 m³/hour).

Inside the REM consortium of Fusina, Ladurner has built the MBR plant for the treatment of 500 m³/h of waste water which, after being treated, is returned to the industrial area for re-use.

Maintenance and restoration for 9 years of 60 lifting stations at various WWTP of ACEA ROME.
REM-TEC deals with contaminated site reclamation, including their characterisation and risk analysis, environmental recovery and clearance of asbestos and related activities. It also has an internal service for laboratory analysis and offers environmental monitoring services therefore offering complete services and solutions for the reclamation sector.
SKILLS AND OUTSTANDING FEATURES

— REM-TEC has a strong integration of skills.
— Technical and scientific: team made up of technicians specialised in the environmental, chemical, geological and engineering fields with skills that are constantly updated on the latest technical and legislative standards.
— Procedural and methodological: team which has consolidated operational procedures based on detailed, concerted, documented activity plans aimed at obtaining transparency and quality.
— Operational, logistical and commercial: team with operational skills, tried and tested in the field, in various reclamation activities from the technical to the logistical phase, as well as the commercial phase and the knowledge of appropriate solutions.

REFERENCES

— Reclamation of the former landfill “Collina BZ Sud” South Bolzano (site of national interest)
— Area of former gas company in Merano
— Area of PASTA ZARA factory (site of national interest: E.Z.I.T. Muggia)

ACTIVITIES

— Reclamation of contaminated sites
— Plans for characterisation and risk analysis
— Asbestos clearance
— Treatment of special waste, both hazardous and non-hazardous
— Disposal and recovery of materials
— Lab analysis
— Environmental monitoring
OUR RECLAMATION WORK IN ITALY

**CONTAMINATED SITE RECLAMATION WORK**

1. Lana (BZ) .................................. formerly Margesin
2. Novate (MI) .............................. formerly Hoechst Schering ex Triulzi
3. Sinigo Merano (BZ) ................... MEMC Electronics
4. Grigno (TN) .............................. Cabot Plastics
5. Laives (BZ) .............................. Tubazioni
6. Fusina Marghera (VE) ............... Vesta
7. Porto Marghera (VE) ................. formerly SAVA
8. Bolzano ................................... Portici
9. Mira (BZ) .............................. formerly CE.LO
10. Fossò (VE) .............................. Solid Urban Waste landfill
11. Chiusa (BZ) ............................ formerly Scalo FS
12. S. Giorgio ............................... Aussa-Corno of Nogaro (UD) formerly Diamante
14. Maréno (BZ) .......................... formerly Azienda del Gas
15. Marghera (VE) ........................ Canale ex Edison
16. Sesto Calende (VA) ................. formerly AVIR
17. Nave (BS) .............................. formerly AFIM
18. Borbiago Mira (VE) ............... A4 motorway junction
19. Piacenza (PC) ........................ Railway area
20. Brennero (BZ) ........................ formerly Dogana
21. Budrio (BO) ........................... formerly Federconsorzi
22. Venezia ................................. Schools in historic centre
23. Pescantina (VR) ....................... Pescantina
24. Villasanta (MI) ....................... formerly Petrolifera
25. Monguelfo (BZ) ...................... formerly Caserma
26. Termoli (TE) ......................... Fis
27. Bologna ............................... Ballast FS
28. Forlì (FC) .............................. formerly Orsi Mangelli
29. Monza (MB) ......................... Doria
30. Pianiga (VE) ......................... formerly Deposito
31. Trevi (PG) ............................ Ecoverde site
32. Bolzano (BZ) ......................... new waste to energy area
33. Vicenza ................................. reclamation of Zambon Group area

**CHARACTERISATION AND DESIGN**

- 33 Trento ................................. Railways North Trento
- 34 Sinigo Merano (BZ) ............... MEMC Electronics
- 35 Mira (VE ) ........................... formerly CE.LO
- 36 Pontelongo (PD) ................... Italiana Zuccheri
- 37 S. Giorgio i. Bosco (PD) ........ formerly Faro
- 38 Fusina Marghera (VE) .......... Alussuisse
- 39 Strambino (TO) ....................... V.I.A. Biogas Plant
CASE STUDY

COLLINA
(SOUTHERN BOLZANO)

Reclamation of a Site of National Interest, former landfill, with 300,000 m³ of hazardous and toxic-harmful industrial waste.

Recovery of material, pre-treatment and removal of 50,000 tonnes of waste sent to foreign disposal and treatment plants.

Reconversion of the site for commercial use.

FORMER GAS COMPANY
(MERANO)

Reclamation of the area occupied by the former gas company in Merano (Bolzano) with recovery of materials, pre-treatment, removal of waste.

Implementation of safety measures using Capping and Jet Grouting technology.

Reclamation of aquifers using a treatment plant Reconversion of the site for residential use

E.Z.I.T. INDUSTRIAL AREA
(MUGGIA, TRIESTE)

Reclamation of Pasta Zara SpA area within the Site of National Interest in Muggia (Trieste).

Controlled excavation and removal of 40,000 tonnes of waste sent to foreign disposal plants.

Reconversion of the site for industrial purposes.
REM-TEC is a polyfunctional platform dedicated mainly to managing hazardous and non-hazardous waste from reclamation activities and the redevelopment of disused industrial sites. It is, therefore, aimed both at industrial waste and waste derived from soil reclamation. The features of the plant are geared towards achieving an integrated waste management, focusing on selecting the recyclable fractions and optimising the management of the fractions which have to be disposed of.
REM-TEC is authorised annually to process 250,000 tonnes of hazardous and non-hazardous waste and occupies an overall area of about 20,000 m² of which 10,000 are sheltered. The main treatment lines are:

- Biological treatment (bioremediation) of ground contaminated by organic pollutants belonging to the fuel category.
- Soil washing of ground contaminated by inorganic pollutants.
- Inertisation.
- Mixing and stabilisation aimed at the permanent recovery of waste
- Selection and sorting of incoming waste in order to optimise the recovery of the different fractions
- Storage of waste for cross-border export upon notification.
CONSULTING SERVICES AND COMMUNICATIONS

OUR IDEAS SERVING THE ENVIRONMENT

The Ladurner Consulting Services and Environmental Communications Division handles issues related to sustainable waste management. Through a systematic approach to design, the Division combines the language and form of communication with technical content. In particular, it has established a name for itself on the Italian market as one of the leading companies in starting up separate waste collection working in critical areas such as large cities and touristic areas.

Municipalities served: 800
Resident served by our projects: 10,000,000

RACCOLTA DIFFERENZIATA DEI RIFIUTI CORTINA D’AMPEZZO PER L’AMBIENTE
(‘SELECTIVE WASTE COLLECTION CORTINA D’AMPEZZO FOR THE ENVIRONMENT’)
CONSULTING SERVICES AND COMMUNICATIONS

SKILLS AND OUTSTANDING FEATURES

Sixteen years of experience and 800 Italian municipalities served: the philosophy of Ladurner’s consulting services and communication division is “ideas and communication with content”. The technical side is made up of professionals with proven experience and a solid background with a multi-disciplinary approach which can adapt its language to the level of communication required. It proposes solutions tailored to the customer’s requirements without falling back on using off-the-shelf models.

PLANNING OF SELECTIVE COLLECTION SYSTEMS

— feasibility studies of waste collection systems
— local surveys and customer site inspections for the set up of door-to-door collection systems
— drafting of financial plans to define waste tariffs drafting of technical tender documentation for the collection and transport service of municipal waste
— waste compositional analysis
— consulting services for the implementation of PAYT fees
— regional/industrial sector-based plans

ENVIRONMENTAL COMMUNICATIONS

— information campaigns on waste, water, mobility and energy
— planning of Green Events
— awareness-raising campaigns
— green life style projects for more sustainable living
— environmental education
— training for sector-based operators and technicians

PORTOFINO. raccolta differenziata dei rifiuti. (“PORTOFINO.SELECTIVE WASTE COLLECTION.”)
**CASE STUDY**

**SET UP OF SEPARATE COLLECTION SYSTEMS**
(MUNICIPALITY OF ANZIO, ROME)

Set up of a door-to-door separate collection service for the entire city supported by the implementation of an information campaign.

**PLANNING OF WASTE MANAGEMENT**
(UMBRIA REGION)

Creation of regional plan for the management of WASTE IN UMBRIA.

Plan presented through an information campaign.

**ENVIRONMENTAL COMMUNICATIONS**
("SEPARATE WASTE COLLECTION CORTINA D’AMPEZZO FOR THE ENVIRONMENT")
(MUNICIPALITY OF CORTINA D’AMPEZZO)

Long experience in communication about separate collection systems: leaflets, calendars and events for residents in the area.

Environmental education in schools.

**GREEN EVENT CHRISTMAS MARKET IN BOLZANO**

Conception and realisation of sustainable events for lowering or compensating the environmental impact of exhibitions, fairs, concerts, sporting events, etc.

**ENVIRONMENTAL EDUCATION**
("EVERYONE IN THEIR PLACE! MAKING A DIFFERENCE AT SCHOOL!")
SORARIS (VICENZA)

Environmental education campaign involving schools, training teachers and lessons in the classroom.
STRATEGIC PARTICIPATION

WASTE TO ENERGY IN SPV

A Division to manage energy recovery from waste by revamping aerobic composting plants

What is it?
— It is a division producing energy from Biogas from municipal waste

What does it do?
— It combines the need to dispose of municipal waste with the recovery of materials and energy to optimise efficiency
— It promotes initiatives in the area of RES, such as the recovery of disused landfills and the conversion of aerobic composting plants into anaerobic plants.
— It seeks out industrial partners which own authorised composting plants and proposes their industrial reconversion and the generation of income with energy recovery (electricity, biomethane, etc.)
To create an industrial initiative starting from a favourable environmental context (increase in separate waste collection), as well as a legislative (energy tariff, biomethane), financial (difficulty of small operators to access credit) and technological (Ladurner) point of view.

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### THE MISSION

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### THE STRATEGY

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### THE STRATEGIC GOALS

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- Search for authorised aerobic composting plants in Italy
- Acquisition of the plant assets identified through the creation of individual Newco with minority stakes of the original shareholders
- Conversion of aerobic to anaerobic technology with a technological partner (Ladurner) to exploit the financial benefits from energy production
- To become a leader in energy recovery from municipal waste
- To be a European player
INVESTMENT OPPORTUNITIES

CURRENT SITUATION:
4 million tonnes/year of selective OFSMW collection

2020 GOAL:
6.5 million tonnes/year of selective OFSMW collection

AREAS WHERE SEPARATE COLLECTION IS CARRIED OUT FROM 10 TO 30%
AREAS WHERE SELECTIVE COLLECTION IS CARRIED OUT FROM 30 TO 40%
AREAS WHERE SELECTIVE COLLECTION IS CARRIED OUT FROM 40%

SOURCE: CIC 2012 ANNUAL REPORT
ANAEROBIC DIGESTION

THE ALBAIRATE PLANT

The plant is located in the Municipality of Albairate (Milan) on an area of 40,000 m² in the Parco Agricolo Sud Milano (Rural Park South Milan). The plant produces biogas for electricity production and quality compost used as an organic soil conditioner in agriculture through production processes which can be basically identified in two stages: anaerobic and aerobic. The technology employed is wet digestion under mesophilic conditions (temperature of 37°).

Technical data

- **2007**: aerobic composting
- **2013**: implementation of aerobic composting area and new anaerobic digestion area
- **Technology used**: wet anaerobic digestion and aerobic bio-cell composting
- **Type of waste treated**: OFMSW and the lignocellulosic structuring fraction
- **Authorised capacity**: 70,000 tonnes/year
- **Nominal electric power**: 2 MW
- **Biogas power fed to the motor**: 4.7 MW
- **Electricity produced**: 17 Mio kWh
- **Thermal energy produced**: 2 MW
- **Quality Compost produced**: 15,000 tonnes/year
THE ALBAIRATE PLANT, MILAN

THE ANAEROBIC PHASE

The plant has a pre-treatment system for the organic fraction of sorted waste which allows the anaerobic digestion of the materials.

The pre-treatment allows any causes for interference to be removed such as packaging (bags, etc.) and inert material (sand, etc.) and to prepare the rough suspension, through shredding and the addition of re-circulating water.

The biogas is stored in a gasometer and then sent to the cogeneration motors to produce electricity which is fed into the grid, net of the consumption used internally by the entire plant.

Yield: 120/130 cubic metres of Biogas per tonne of OFSMW; 2.5KWh per cubic metre of Biogas.

THE AEROBIC PHASE

The material from the anaerobic digestion, after having been separated from the water by centrifuges, is mixed with structuring material (plant material and branch cuttings) and treated, in an initial phase, in the Ladurner bio-cells.

Thanks to the intensive fermentation in the bio-cell, with the temperature, humidity, request for oxygen and airflow constantly controlled and configured by computerised systems, a material is obtained that is stacked in ageing yards where it is periodically turned and dampened, and subjected to a final screening before becoming a final product (compost) to be used in fields on farms.

Yield: 120/130 cubic metres of Biogas per tonne of OFSMW; 2.5KWh per cubic metre of Biogas.
The Tortona plant, in a strategic position within the Milan-Turin-Genoa industrial triangle, is made up of two distinct areas arranged in series. In the first, anaerobic biodigestion takes place. This is where the biomasses delivered undergo a biochemical type conversion that produces biogas and a stabilized residue resulting from the digested sludge. In the second, already in operation since 1995 and today undergoing revamping, the digested matter is transformed into compost, a stabilized product to be used as an organic soil conditioner in agriculture and for environmental rehabilitation.

The Tortona plant is extremely modern in every respect thanks to its use of the best technology existing on the market today and due to the maximum reduction of environmental impact resulting from the new establishment under construction.

For this reason, the Tortona site is part of a major research and development project financed by the Ministry of Economic Development within the “Industria 2015” project. These are also reasons why the Tortona site is part of an important research and development project, funded by the Ministry for Economic Development under the tender “Industria 2015”.

Overall the plant allows for the treatment of 33,000 t/year of OFMSW from separate waste collection, 7,000 t/year of lignocellulose fraction, and the equivalent of 2,000 t/year of sewage sludge, that can be adapted with the OFMSW to up to 10,000 t/year.
Dopo Albairate la pipeline delle iniziative da Nord-Ovest a Centro-Sud:

- **SCURELLE (Trentino)** .................. finished
- **TRAPANI (Sicilia)** .................. under construction
- **FOGGIA (Puglia)** .................. under construction
In 1998 Ladurner designed a system to process the dry fraction of municipal waste which could produce fuel with a high calorific value. The first problem to overcome was how to use the RDF produced without altering the delicate environmental balance in Venice. The idea, therefore, was to optimise the plant operations in the industrial area of Porto Marghera by developing an industrial system with the goal of maximising the recovery of existing thermal cycles. The benefits of this choice proved to be quite significant from the beginning. Firstly, no new waste-to-energy plants were built to process the RDF produced. Then, the amount of fossil fuel used by the existing power stations was reduced, the atmospheric emissions from the combustion processes were reduced and benefits could then be received from the financial contributions envisaged by current legislation.

The decision was taken, therefore, to set up a plant-engineering system to produce quality RDF which then could be used in the Palladio power station in Fusina in a co-firing process with coal, by involving ENEL Produzione.
In 1998, an agreement was signed between the competent district Authorities (Veneto Region, Province of Venice, municipality of Venice and Ecoprogetto Venezia and Enel) to regulate the allocation and the energy recovery of the RDF produced.

Operations were preceded by a rigorous experimental production programme (to establish the optimal percentages of RDF to use in the heating units) and an environmental assessment (managed by ARPAV) to determine the effects of the gas emissions in the atmosphere during the co-firing stages. At the end of this experimental process, the following was verified:

— the amount of usable RDF was approx. 5% of the coal which powers the Palladio power station
— the effects of the emissions from the use of RDF in the co-firing process were negligible.

The experimental stage has now finished with the integrated environmental authorisation signed by the Minister, Stefania Prestigiacomo, on 25 November, 2008 following the conference of the services which took place in Rome on 23 September, 2008.

After the verification and stabilisation stages, the authorisation allows for the recovery of 18 tonnes/h of RDF at the Enel power station, taking into account the restriction of discharging water during the summer period.

The possibility of overcoming this restriction is being evaluated in collaboration with Enel in order to achieve a potential recovery of over 100,000 tonnes per year with a saving of about 65,000 tonnes of coal and a CO₂ reduction of 93,000 tonnes/year.
It attempts to bring together the experience of Ladurner Ambiente in the construction and management of biogas plants and the experience in the cultivation and management of biomass by farm owners in a specific area. The plants are, in fact, located near to catchment areas which are carefully identified in order to ensure the proximity of a supply of raw materials. How does Enerfarm carry out its business? It identifies farmer owners interested in building biogas production plants for setting up local joint venture SPVs, providing agricultural businesses with the possibility of accessing the renewable energy market with an industrial partner, the Ladurner group, which acts as guarantor for the correct technical functioning of the plant. Enerfarm takes care of the construction and management of the biogas plant, handling the authorisation process, bank loans and the sale of the electricity and green certificates which are very complex activities for which specific, specialised know-how is required.
SYNERGIES BETWEEN INDUSTRIAL PARTNERS AND AGRICULTURAL PARTNERS

How does a joint venture SPV work?
The SPV is controlled by Enerfarm and is an SRL (limited liability company) in all that it does. The shareholders are Enerfarm and the local agricultural company. It is managed by a board of directors with two members in which the chairman is nominated by the agricultural shareholder and the CEO of Enerfarm.
Ladurner Ambiente, through its holding Ladurner SPA, builds the plant, supplying the management service and the full-service maintenance as well. The agricultural company, which represents the farmers, rents the land cultivated by the SPV or supplies the finished biomass to the plant for biogas production.

Industrial and agricultural partners share tasks
Enerfarm handles authorisations, funding, construction, plant management and maintenance while the agricultural partners handle relations with local agricultural companies and third parties and oversee the supply of the biomass.

But the owner of the authorisation is, however, the joint enterprise.

The dimensions of the plant
Standard measures are adopted in terms of electric megawatts, namely 1 MW, which can generate 7 million kWh of electricity per year.
With 49% owned by Ladurner Ambiente, it produces energy generated by biogas from agricultural sources. It owns seven plants for a total of 7 MW installed.

**Plants owned**
- Società Agricola San Daniele (Cremona)
- Società Agricola Sant’Elena (Cremona)
- Società Agricola Enersab (Mantua)
- Società Agricola Poggio Energia (Mantua)
- Società Agricola Martinelle Energia (Venice)

**Main features**
- Power: 0.99 MWp
- Production capacity: 8,000,000 kWh per year
- Feed-in tariff: 0.28 €/kWh
ENERGY EFFICIENCY ON WATER

THE ILLUMINATED PATH OF THE PORT OF VENICE

The illuminated pathway in the Port of Venice is a light signalling installation operating in the Malamocco sea channel. Marghera has an approximately 15 km long channel which allows large cargo ships to enter the port from the open sea. This was a project to modernise the technology of the existing plant and make it energy efficient by replacing the obsolete and expensive lighting technology with modern and efficient LED technology.

At the same time, the electrical power supplied via a network of underwater cables which was difficult and costly to maintain was switched over to an autonomous power supply from photovoltaic panels with an integrated electrochemical accumulator guaranteeing the total energy self-sufficiency of the installation.

Year of construction: 2015
Malamocco – Marghera channel
Length: ......................................... 15 km
Number of lights: ............................ 345

LED bulbs
Nominal power: .............................. 3 W
Nominal voltage: ........................... 12 V
Number of bulbs per pole: ................. 2
Total installed power: .............. 2070 W
Colour of lights: .................. amber yellow

Photovoltaic modules
Nominal power: .......................... 65 Wp
Number of modules per pole: ................. 4
Total installed photovoltaic: ... 89.70 kW

Batteries
Technology: ................................ Pb gel
Rated capacity: ............................ 50 Ah
Nominal voltage: ........................... 12 V
Number of batteries per pole: ............... 4
Total installed capacity: ...... 69000 Ah
Estimated autonomy: approx. 10 days
Ladurner invests in successful energy efficiency projects on behalf of its clients, by taking on the management and responsibility of the results in exchange for a service fee. Ladurner designs innovative public lighting solutions by adopting the concept of “Smart City”. Through specific technology and additional services, it contributes towards enhancing the “coordination and inter-connection platform” with which Administrations manage the transformation of “Smart” cities.
Ladurner Solar is a qualified operator in the PV sector with an excellent track record to its name. On the strength of its long-standing experience in the design, implementation and management of industrial-scale photovoltaic parks, Ladurner Solar now performs asset management activities on behalf of investors by supporting them in the assessment, acquisition and management (O&M) of assets through due diligence techniques and, where necessary, by proposing technical solutions aimed at stabilising and improving production performances over time.

Ladurner Solar designs and implements photovoltaic solutions aimed at integrating energy savings projects in public and private areas. Among the most innovative solutions for the application of photovoltaic technology, Ladurner Solar has concentrated its application-oriented research to cluster or stand-alone industrial plants in which all the energy produced is employed by the user thanks to a battery accumulation system.

This solution allows the industrial client to achieve total energy autonomy. In its role as EPC Contractor, Ladurner Solar creates industrial plants (on roof-tops) and ground-based plants (Solar Parks) with a turnkey solution, in addition to plants on agricultural greenhouses and on parking shelters.
SOME OF OUR INSTALLATIONS

- **VILLA BARTOLOMEA (VR)**
  - Output: 996 KWp - on ground

- **VNICE**
  - Output: 900 KWp - on ground

- **REGGIO EMILIA**
  - Output: 500 KWp - on ground

- **MANCASALE**
  - Output: 992.6 KWp - roof-top

- **MANCASALE**
  - Output: 992.6 KWp - roof-top

- **BRESCELLO**
  - Output: 989 KWp - roof-top

- **CARPI (MO)**
  - Output: 680 KWp - on ground

- **CARPI (MO)**
  - Output: 300 KWp - on ground

- **VALLELUNGA**
  - Output: 823 KWp - on ground

- **ANAGNI (FR)**
  - Output: 996 KWp - roof-top

- **BRINDISI 1**
  - Output: 997 KWp - on ground

- **BRINDISI 2**
  - Output: 997 KWp - on ground

- **BRINDISI 3**
  - Output: 997 KWp - on ground

- **BRINDISI 4**
  - Output: 997 KWp - on ground

- **BRINDISI 5**
  - Output: 997 KWp - on ground

- **CASSANO**
  - Output: 13,000 KWp - on agricultural greenhouses
CASE STUDY - OUR PLANTS IN ITALY

SOLAR PARK
(VALLELUNGA - ROME)

An innovative project, the circuit will be completely self-sufficient from an energy consumption point of view with a total output of 823.00 KWP. Net active surface area 6,223 m².

INSTALLATION ON GREENHOUSES
(CASSANO - COSENZA)

Total output 13,000 KWP. Installed on agricultural greenhouses built by us. Overall surface area 34,000 m². Net covered surface area 9,000 m².

SOLAR PARK
(BRINDISI)

European tender won, launched by the second largest multi-utility company in Italy. 5 plants with a total output of 4,985.00 KWP. Net active surface area 39,000 m².

CAVARZERE
(VENICE)

Ground-installed plant with AMORPHOUS technology.
OUR CODE OF ETHICS

CODE OF ETHICS
AND THE ADOPTION OF ORGANISATIONAL AND
MANAGEMENT MODELS IN ACCORDANCE WITH
ITALIAN LEG. DECREE 231/2001 BY THE LADURNER
AMBIENTE GROUP

The Ladurner Ambiente Group has adopted its own Code of Ethics. The code of ethics is the company’s “Constitutional Charter”, an official document approved by the Board of Directors of the subsidiaries of the Ladurner Ambiente Group and represents the declaration of the set of rights, duties and responsibilities of the subsidiaries towards the parties which it deals with in pursuing its corporate objective (customers, suppliers, employees, shareholders, authorities, institutions, communities, public administrations and financial markets, etc.). The Code of Ethics also sets the benchmark standards and the rules of conduct which support the company’s decisional processes and the guidelines for behaviour.

It is an integral part of the Organisational and Management Models in accordance with Italian Leg. Decree No 231/2001 to which all the subsidiaries of the Ladurner Ambiente Group adhered during 2011.

The common good is the environment, an important word, which refers to everything that surrounds and hosts us, to the places and the people among which and with whom we live.