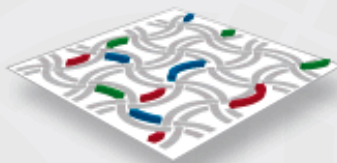


LOMBARDY ENERGY CLEANTECH SECTOR

Exploring one of the most promising
investment in Lombardy



**INVEST IN
LOMBARDY**



PROMOS



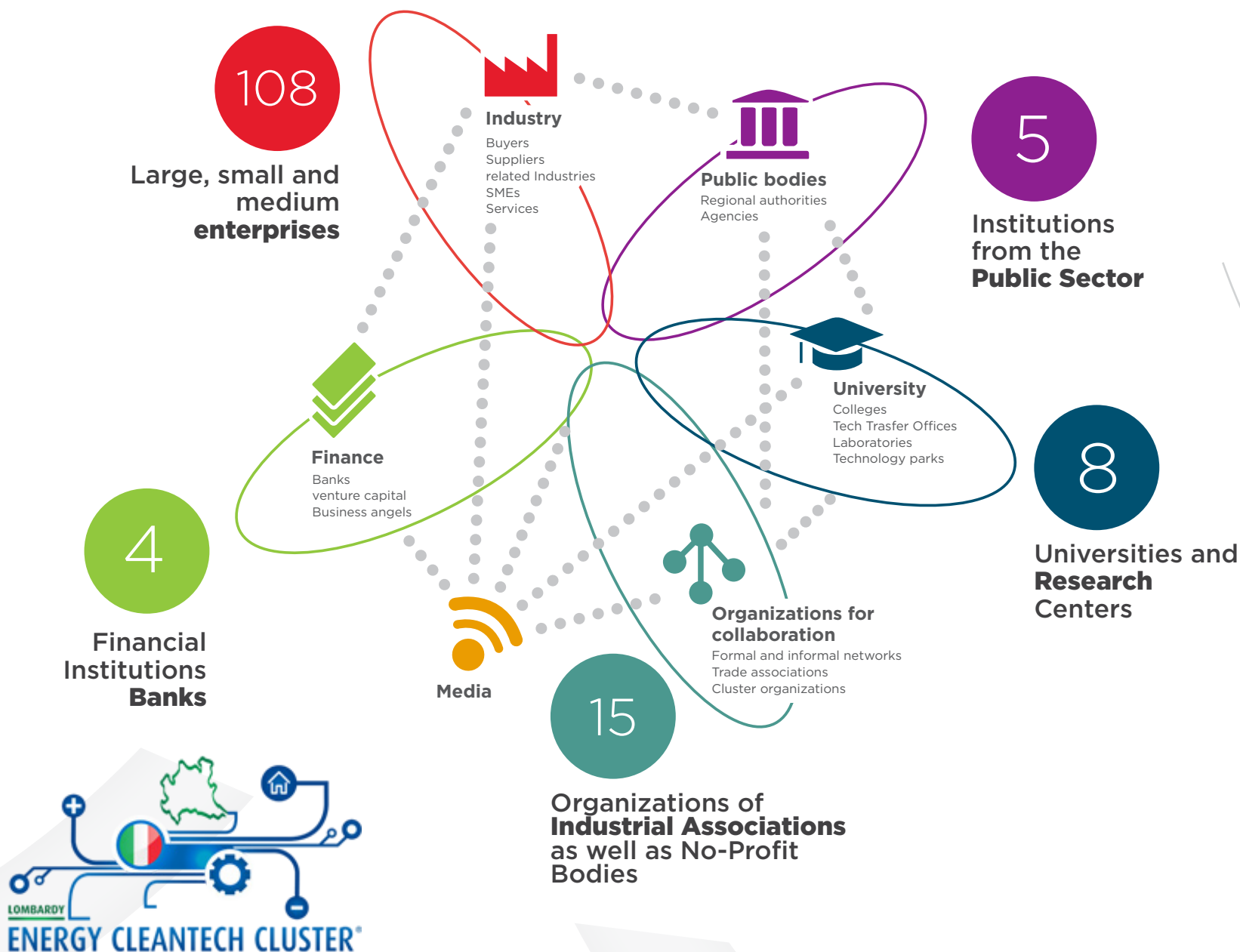
WELCOME TO THE LAND OF KNOWLEDGE

Welcome to **Lombardy**, the leading region in Italy for its economic vitality and the quality of its knowledge system and human capital. Considered one of the four “Engines of Europe”, Lombardy leads the way in innovation and development in the energy cleantech field.

The Lombardy Energy Cleantech Cluster (LE2C) is today one of the most prominent clusters in the south-Europe. A strong network built upon the multiple helix model, made by enterprises, public and financial Institutions, industrial associations, Universities and research centers.



LE2C THE MULTIPLE HELIX MODEL



A SNAPSHOT OF LOMBARDY'S COMPETENCIES IN THE CLEANTECH ENERGY SECTOR

Lombardy has all of the ingredients of a dynamic ecosystem through which the **Cleantech Energy Sector** thrives and prospers. Below is a snapshot of its main elements.



Research institutions

10 Universities and **5 Research centers** provide the most advance researches in the field. Research groups are very active in exploring the extreme horizons of technology in the cleantech energy field through 440 joint projects with other universities



People

More than **3,000 academics** animate the scientific scene of Lombardy. These include Professors, lectures, doctoral/post-doc. researchers.



Labs

94 Departments, research centers and other institutions act as agents for technology transfer from universities to companies in the area.



Companies

300 cleantech companies in the region (both members and non-members of cluster organization).

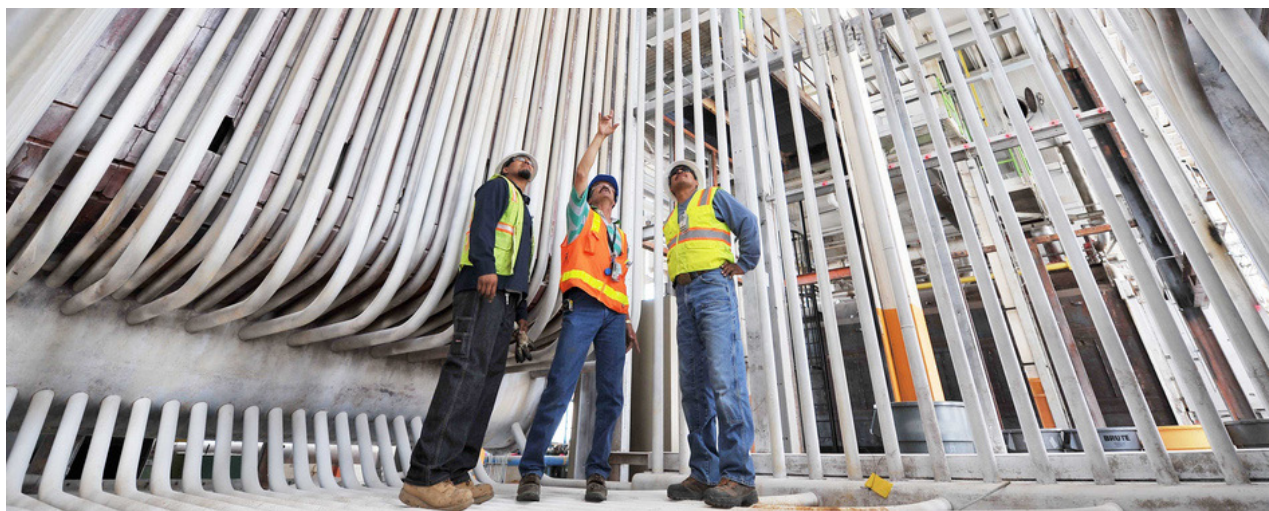
LE2C: THE EXCELLENCE IN THE CLEANTECH ENERGY SECTOR



The Lombardy Energy Cleantech cluster is the beating heart of Italian excellence in the energy sector, with 108 companies, generating €23bn and employing 31,000 people across the entire region.

LE2C supports the competitiveness of the companies included in the cluster by promoting innovation and technology transfer, facilitating access to european funding and fostering internationalization.

Networking and excellence in knowledge are the key assets of this cluster and are sustained by the development of a web platform for knowledge sharing, co-project and coordination among members of the cluster.



**108 companies,
generating
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entire region**

TALENT, RESEARCH AND INNOVATION

LE2C's companies can benefit of the technological infrastructures and talents provided by the network of 8 Universities and research centers, CNR's Institutes (8 in LE2C), public and scientific foundations that cooperate through the Clusters' system.

Highlights on technological and research excellence

RSE researched on more than **600 recorded cases** for public administration, utilities, power industries and academia. RSE has been partner in more than **60 European projects** and coordinates the EERA Joint Programme on Smart Grids and chairs the International Smart Grid Action network.

The Polytechnic of Milan is the **1st University in Italy** in the field of Engineering and Technology, with more than **700 patents and 23 spin-off** in the field of energy efficiency and sustainable building.

The CNR (in LE2C with 8 institutes) has developed Organic Light-emitting Devices (OLEDs), and **innovative technologies** about sterilization systems,

automotive, hydrogen, photonics, nanotechnologies etc.

The University of Milano- Bicocca, has **19% of active spin off** in Energy and Environment, and develop **8% families patents** in Energy and Environment. The **MIB-SOLAR** is leading research center in the field of photonics and solar energy.

The Lab#ID is the research center of Università Cattaneo specialized in RFID systems. Since 2007 Lab#ID has carried out about 60 projects, for about fifty organizations, across different fields.

The Universities of Bergamo and Brescia contribute to the innovation clean&energy sector with more than 15 research groups.

SIX MAIN MARKET AREAS

Companies working in the cleantech field in Lombardy work on six main market areas, developing products and services along the overall supply chain. For each area, LE2C actively fosters and promotes collaboration, networking and R&D activities.



CONVENTIONAL & NUCLEAR

All companies producing systems and components for power stations and plants for thermal and nuclear energy production (including subcontractors).

Main players: STF, CNR- Institute of Plasma Physics



ENERGY EFFICIENCY

Transversal area, including companies working in the efficiency energy field.

Main players: Robur, Polytechnic of Milan



RENEWABLE ENERGY

Companies with experiences in the renewable energy sector, particularly waste-to-energy and biomass plants (including geothermal and hydroelectric fields).

Main players: EuroEnergy Group, University of Milano Bicocca - MIB Solar Dept.



SMART GRIDS

All companies to strengthen and increase the efficiency of transport and distribution systems in the energy field.

Main players: Enel Distribuzione, RSE - Research on the Energetic System



WATER TREATMENT

Companies and consortia belonging to the “water field”: water treatment technologies, economic efficiency, sewage disposal, water safety, informative systems development.

Main players: Comodepur, CNR - Water Research Institute



ECO BUILDING

Companies producing materials and innovative building techniques for the life quality improvement, low cost technologies for the reuse of building materials, integrated system for the energy consumption monitoring etc.

Main players: Borio Mangiarotti, Polytechnic of Milan - BEST Dept.

LE2C ACTIVITY FRAMEWORK

Research and Development

Participation and development of EU and national funded projects, for more than € 5 mln, aimed at increasing the quality and innovation of firms' products.

Internationalisation

Promoting international visibility, market knowledge and competencies to operate on international market. Moreover, LE2C cooperates with other international clusters and organizations, promoting innovation and knowledge sharing.

Matching

Facilitating cooperation between cluster firms, institutional and academic partners towards a common goal: increasing strength and competitiveness of companies.



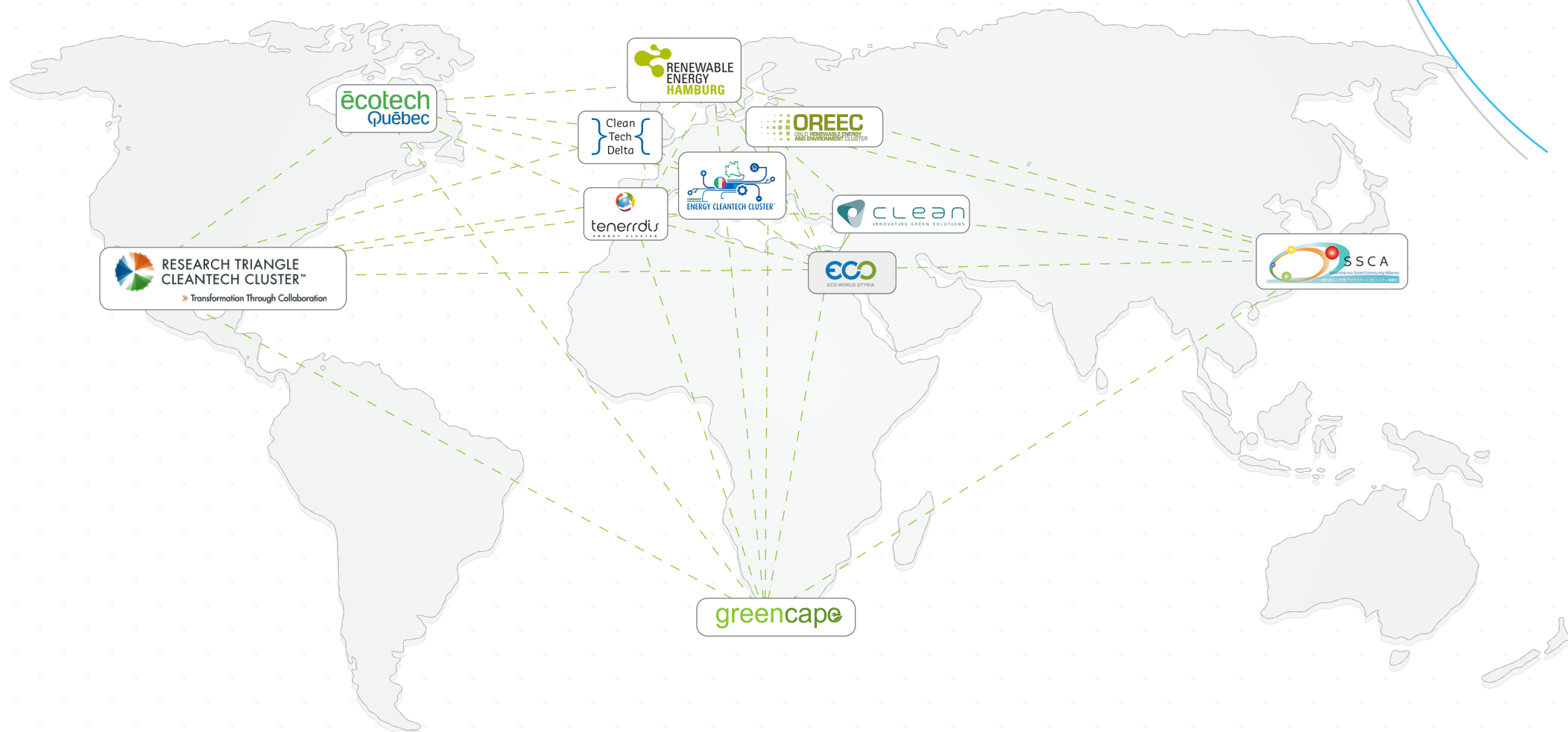
In 2015, LE2C was the first Italian cluster which obtained the Cluster Management Excellence certification “Gold Label”.



A stylized world map with continents in light green and oceans in white. The map is covered with a fine grid of small dots. Decorative curved lines in blue, green, red, and grey are scattered around the map.

A Region connected to the world

LE2C is part of the **ICN**, the leading **global network** of the best performing cleantech clusters.

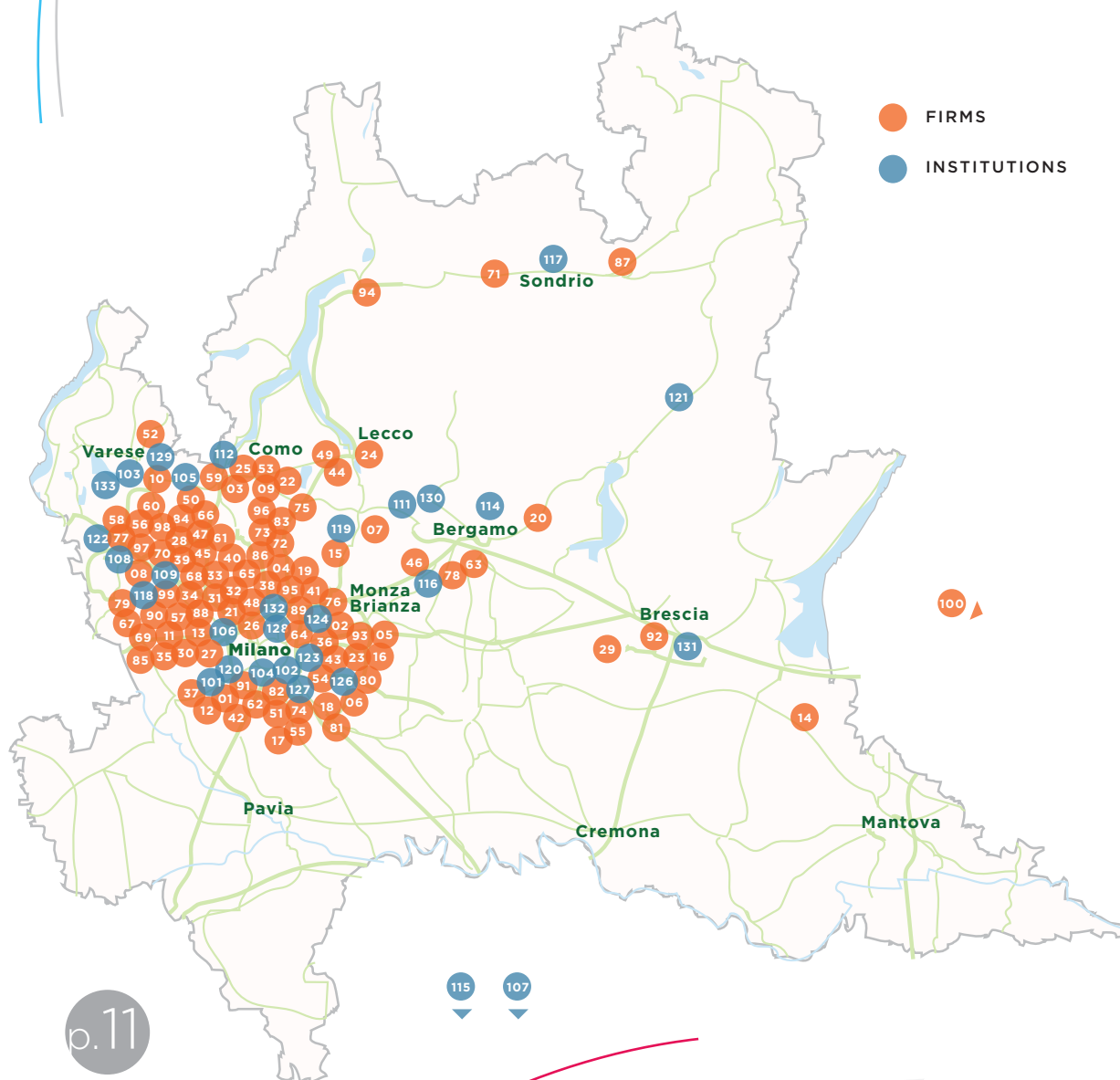


All over the world, cluster organizations support companies' development, build opportunities and foster innovation in the cleantech energy field.

More than **8,000 entities connected with Lombardy** thanks to the clusters' system.

THE MOST ADVANCED ITALIAN NETWORK OF KNOWLEDGE ON THE ENERGY CLEANTECH FIELD

The Lombardy Cleantech Energy Cluster acts as a platform between the industries, institutions, universities and research centers distributed in the region and working in the field of cleantech energy, fostering research & development, innovation, networking and investment opportunities.



- 01 A.T.S. Air Treatment System S.R.L.
- 02 Abb Italia - Power Products Division
- 03 Acquadotto Industriale Soc. Cop. A R.L.
- 04 Aderma S.R.L.
- 05 Aeromeccanica Stranich S.P.A.
- 06 Alfaquadri S.P.A.
- 07 Ars Aedificandi S.P.A.
- 08 Ars Ambiente S.R.L.
- 09 Asil - Azienda Servizi Integrati Lambro Spa
- 10 Assi S.R.L.
- 11 Bama S.R.L.
- 12 Benteler Distribuzione Italia S.P.A.
- 13 Bentoncabo S.P.A.
- 14 Bersy Srl
- 15 Boldrocchi
- 16 Bono Energia S.P.A.
- 17 Borio Mangiarotti S.P.A.
- 18 Brembana Costruzioni Industriali Spa
- 19 Bulk S.R.L.
- 20 Cabra Engineering Srl
- 21 Carpenteria Rossi Srl
- 22 C.E.A.R. Laboratori Riuniti Srl
- 23 Cobaty Italia
- 24 Colombo Costruzioni S.P.A.
- 25 Comodepur Spa
- 26 Cosmel Di La Cognata T. & C. Snc
- 27 D.E.L.C.O Srl
- 28 De Pretto Industrie S.R.L.
- 29 Deldossi S.R.L.
- 30 Donadon Sdd Srl
- 31 Donelli Alexo S.R.L.
- 32 Diplomatic Oleodinamica S.P.A.
- 33 E.C.M. Engineering Costruzioni Montaggi S.R.L.
- 34 Ezs3 Srl
- 35 Elettromeccanica Colombo S.A.S.
- 36 Enel Distribuzione S.P.A.
- 37 Energy Team S.P.A.
- 38 Enertech Solution S.R.L.
- 39 Euroenergy Group S.R.L.
- 40 Exergy Orc
- 41 Etatech Srl
- 42 Ezio Selva S.R.L.
- 43 Falck Renewables S.P.A.
- 44 Farina Presse S.R.L.
- 45 Felm S.R.L.
- 46 Flame Spray S.P.A.
- 47 Forgiatura San Giorgio S.P.A.
- 48 Futuris Spa
- 49 Galbiati Group S.R.L.
- 50 Green 2 Green Srl
- 51 Icim
- 52 Impresa Di Costruzioni Albini E Castelli S.R.L.
- 53 Impresa Costruzioni Nessi & Majocchi S.P.A.
- 54 Intecs Informatica E Tecnologia Del Software Spa
- 55 Italiana Energetica Tire Srl
- 56 La Quotata Saracinesca S.N.C. Di Marcora Pierluigi & C.
- 57 Laboratorio T.O.S.I.
- 58 Lacomel Srl
- 59 Lariana Depur S.P.A.
- 60 Leplast N. S.R.L.
- 61 Loteries S.P.A.
- 62 Mangiavacchi Pedercini S.P.A.
- 63 More S.R.L.
- 64 Nier S.R.L.
- 65 O. & S.I. S.R.L.
- 66 Officina Meccanica Puricelli S.R.L.
- 67 Officine Meccaniche Mara Gian Mario & C. S.R.L.
- 68 Parcol S.P.A.
- 69 Parisi E Fornillo S.N.C. Di Forniello D. & C.
- 70 Pensotti Fcl
- 71 Politec Valtellina Soc. Cooperativa
- 72 Pozzi Leopoldo Srl
- 73 Pramec Srl
- 74 Praxair S.R.L.
- 75 Prei S.R.L.
- 76 Redecam Group Srl
- 77 Res - Rete Efficienza Sostenibile
- 78 Robur Spa
- 79 S.O.N. S.R.L.
- 80 Saeco Engineering Spa
- 81 Saipem S.P.A.
- 82 San Marco Bioenergie Spa
- 83 Seam Engineering Srl
- 84 Sices S.P.A.
- 85 Stf S.P.A.
- 86 Sud Seveso Servizi Spa
- 87 Tcvv Spa
- 88 Tecnoimpianti Srl
- 89 Tethys Srl
- 90 Termoresine S.P.A.
- 91 Tiemes Srl
- 92 Turboden Srl
- 93 Uniterm S.R.L.
- 94 Valland S.P.A.
- 95 Vergaengineering S.P.A.
- 96 Voltasolar S.R.L.
- 97 Walley Design S.R.L.
- 98 Wte Waste To Energy Srl
- 99 Yottawatt S.R.L.
- 100 Zignago Power Srl
- 101 Ance Lombardia
- 102 Assolombarda
- 103 Associazione Artigiani Della Provincia Di Varese
- 104 Camera Di Commercio Di Milano
- 105 Camera Di Commercio Di Varese
- 106 Cna Lombardia
- 107 Consiglio Nazionale Delle Ricerche (CNR)
- 108 Comune Di Legnano
- 109 Confartigianato Alto Milanese
- 110 Confindustria Alto Milanese
- 111 Confindustria Bergamo
- 112 Confindustria Como
- 113 Confindustria Lombardia
- 114 Consorzio Compere
- 115 Consorzio Interuniversitario Nazionale Per La Scienza E Tecnologia Dei Materiali
- 116 Contratto Di Rete Infrabuild
- 117 Credito Valtellinese
- 118 Euroimpresa Legnano Scrl
- 119 Fondazione Distretto Green And High Tech Monza Brianza
- 120 Fondazione Energy Lab
- 121 Impresa E Territorio Scarl
- 122 Istituto Italiano Della Saldatura
- 123 Politecnico Di Milano
- 124 Provincia Di Milano
- 125 Regione Lombardia
- 126 Ricerca Sul Sistema Energetico - Rse S.P.A.
- 127 Uni - Ente Nazionale Italiano Di Unificazione
- 128 Unicredit Spa
- 129 Unione Degli Industriali Della Provincia Di Varese
- 130 Universita' Degli Studi Di Bergamo
- 131 Universita' Degli Studi Di Brescia
- 132 Universita' Degli Studi Di Milano-bicocca
- 133 Universita' Liuc

Turboden and Mitsubishi Heavy Industries

Turboden Srl is a leading company in development and production of ORC (“Organic Rankine Cycle”) turbogenerators, for the generation of power and heat from renewable sources (biomasses, geothermal, solar thermodynamic) and heat recovery in industrial processes.

Founded in 1980 in Milan by Mario Gaia (Professor of Energy at the Polytechnic of Milan), in the first period Turboden carried out mainly research projects, turning into a real industrial entity in the late '90s, also thanks to the incentive schemes promoted by European countries. This growth allowed the company to acquire the status of **“leading company” in the ORC technology**; however, the company would hardly have been able to evolve towards the global market without an alliance with an international player.

Some international holdings started to be interested in Turboden's growth and potentials and, in 2009, the company became part of UTC Corp., an American multinational interested to develop ORC solutions from renewable sources and waste heat worldwide. In 2013, UTC exits from the power market, forming a **strategic alliance with Mitsubishi Heavy Industries**, and Turboden enters in the Japanese group. A “win-win strategy” for both the partners: on the one hand, the Italian company can continue the growth on the international markets (particularly in Japan and Far East); on the other hand, the investors have been enabled to grow on the power sector, thanks to Turboden's know-how, to its qualified human resources and to a territorial context supporting research and innovation, two key elements of the Japanese culture.

Research and talented people: the strategic assets for Lombardy's attractiveness

Research is in Turboden DNA: the research on the **ORC technology**, brought on at the Polytechnic of Milan - one of the leading technical university in Europe - provided the bases for the Company's development. Turboden owns 16 international patents and invest the 8% of its annual turnover in R&D.

The presence of **highly qualified human resources** - thanks to the excellent and extremely **dynamic university system** (as demonstrated by the several research project developed in the energy sector by Lombardy universities and research centers) - is an essential asset for Lombardy's attractiveness, explains Mr. Bertuzzi (CEO of Turboden). These elements confers a **great “innovative potential” to the region**, that can be considered fully integrated in an “operative European framework” in terms of operational efficiency. And, last but not least, the **region's excellence in the mechanical sector** (essential for the production of turbogenerators): these elements have convinced the investors to believe in Lombardy as a center of excellence for in this field.

Today, Turboden has 314 ORC plants in 33 Countries, with a turnover of € 62 million (with about the 80% realized in foreign markets). **Thanks to the alliance with Mitsubishi Heavy Industries, in the next years Turboden will have the opportunity to enhance its geothermal reference portfolio at the global level and to increase the investments in R&D activities. Mitsubishi Heavy Industries, traditionally focused on large-capacity gas turbines, is nowadays able to provide to the market a wider range of products, thanks to the partnership with the Italian company.**



CASE STUDY

BONO Energia

An Italian company with a strong international spirit

The Italian company Bono Energia is dedicated since 1958 to design, manufacturing, installation, service and maintenance of industrial boilers (fire and water tube), heat recovery boilers, auxiliary boilers, thermal fluid heaters and biomass boilers. It has a consolidated reputation in several manufacturing sectors; furthermore, it collaborates with the main oil companies and EPC contractors all over the world, in different areas. Energy efficiency and low emissions are the Company's flagship.

Joining the Cannon group in 1988 (an international group, owned by Italian entrepreneurs, supplying worldwide a wide range of industries with dedicated engineering solutions), the Company fully embraced the innovative and international "attitude" of the holding. With its two industrial plants in Lombardy Peschiera Borromero (Milan), and Netro (Biella), nowadays Bono Energia is a worldwide key player, being particularly appreciated for its **auxiliary boilers for power plants** and **heat recovery boilers** and **heaters from gas turbines**. The Company has local units in Russia, France and Singapore - where it provides commercial support, after sales, commissioning and start up services - and it is able to serve the global market thanks to its sales network and agents. Its products are installed - for example - in France, Kazakhstan, Poland, Vietnam, Pakistan and Thailand.

Research, manufacturing excellence and partnership: the key factors for the energy sector's growth

"Lombardy is an ideal region for the growth and thrive of the energy sector, due to the presence of specific factors" - says Alessandra Leni, marketing manager of Bono Energia. "First of all, the **high quality of the education system and human capital**: with its Universities and research centers, Lombardy has a great tradition in education in both technical and economic sectors, providing high quality human resources and talented people. Moreover, Lombardy is a **centre of excellence for the mechanical industry**: this encourages upstream and downstream collaborations with local reliable suppliers and partners. Particularly, the areas of Milan, Bergamo, Brescia and Varese are well known for the expertise in the boiler sector. And, finally, **Lombardy is a favourite region for the specific energy sector**. The presence of several specialized companies in the region - from the local manufacturing SMEs to the international energy utilities groups and EPC contractors (active at the global level) - highlights that **in Lombardy the overall energy value chain is represented** (in the conventional as well as in the renewable sector); **a chain that is strongly oriented towards innovation, thanks to the academic department and research centers working in the energy field**. The increase in the number of companies operating in renewables demonstrates the region's attitude to innovation".



CONCLUSION - WHY INVEST IN CLEANTECH ENERGY LOMBARDY

LOMBARDY: AN ENGINE FOR EUROPE

The GDP of Lombardy amounts to 326 billion €: it represents more than **20% of the national GDP**. Moody's has attributed an Aa1 rating to the Lombardy Region.

The region is **one of the four Engines of Europe** (a network of the most advanced European regions).

LE2C ADDED VALUE

Grouping together local products and services suppliers for generation, distribution and efficient use of electricity, LE2C:

- improves innovation and competitiveness
- promotes international visibility
- allows reduction of costs and mark-up and reliability of delivery times, thanks to the offer of a "pre arranged package" of high qualified firms that act as a strong group.

THE LOMBARDY ENERGY SECTOR

Lombardy is home to 50% of Italian industrial firms and the electrical energy sector is represented by approximately 23,000 employees and 500 firms. About **40% of the Italian firms operating in the renewable field** are located in Lombardy.



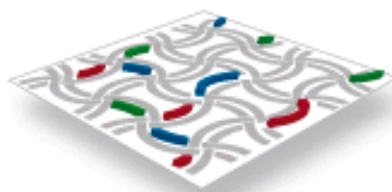
Find out more

Invest in Lombardy is the service for attracting foreign investments into the Lombardy region.

Invest in Lombardy is structured as a regional network that works closely with business communities and helps address their needs.

Want to invest in Lombardy?

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