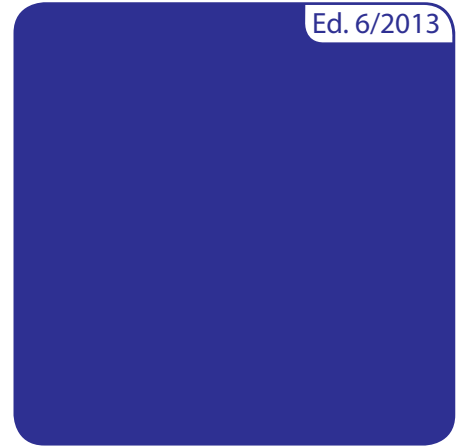
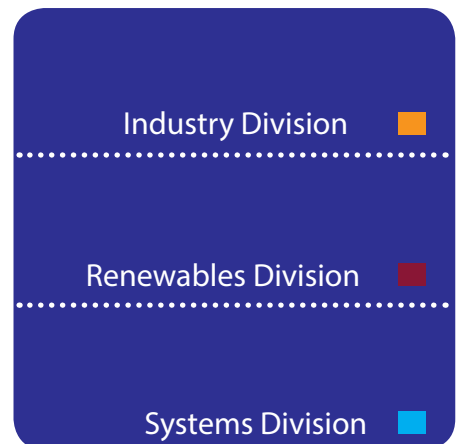
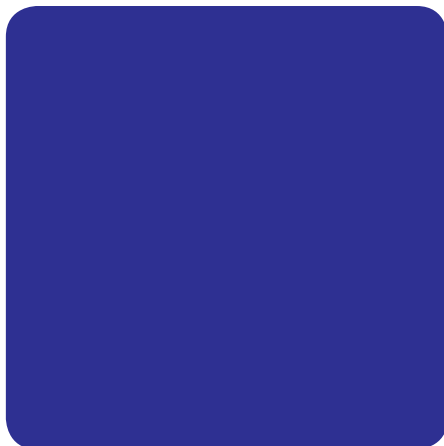


COMPANY PROFILE AMARC DHP

DISTRICT HEATING POWER PLANTS



Ed. 6/2013



DISTRICT HEATING POWER PLANTS





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Today, Amarc DHP (District Heating Power Plants) designs, builds and installs energy production plants for district heating systems using traditional or renewable sources.

Together with Amarc DHS (District Heating Substations), with more than 50 district heating power plant and component models and more than 300 substation models, Amarc DHP has one of the most complete product ranges in Europe.

The commitment of the company's research and development department, especially in recent years, has been focussed on achievement of the following objectives:

- Simplification of plant construction, management and maintenance;
- Engineering of machines and components as well as

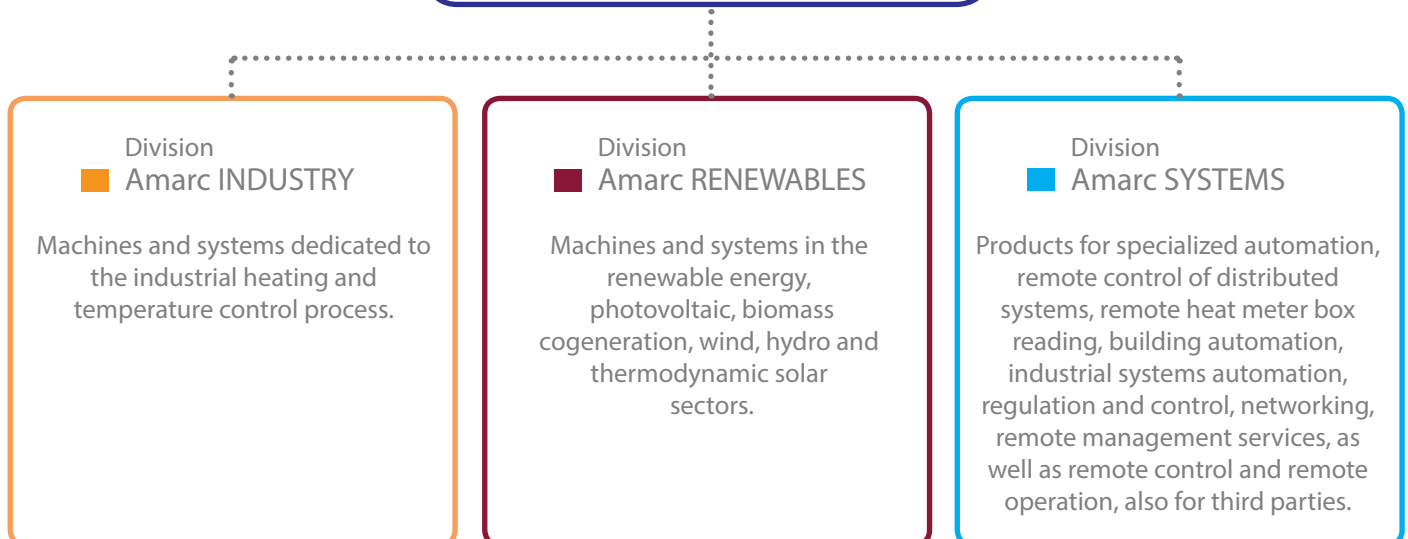
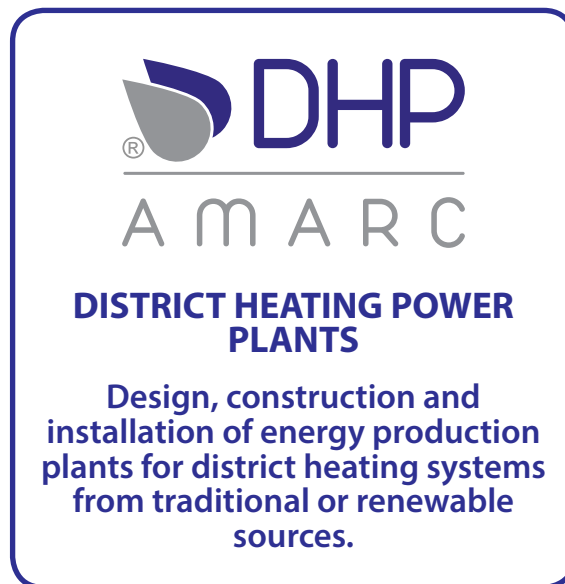
project standardization, with a significant reduction in implementation costs;

- Development of the management system of the entire plant with particular attention to the integration and optimization of operation;
- Reduced of delivery times.

More than 10 years of experience in the industry have created a management and optimisation computer system that can integrate network, substation and production plant requirements and functions in one software application, which can make all the difference in terms of profitability for district heating plants.

The following divisions are an integral part of Amarc DHP:

- Amarc INDUSTRY
- Amarc RENEWABLES
- Amarc SYSTEMS





The company has developed from experience consolidated in the industrial heating and process control industry.

Amarc has always worked in the industrial heating and process control field, in particular in the following areas:

- Low and high temperature electric heating systems including monitoring and control thyristor (SCR - Silicon-Controlled Rectifier) systems.
- Direct and indirect heating.
- Direct and indirect methane gas heating and combustion chambers.
- Steam, diathermal oil, hot and superheated water transport and heat regulation.
- Ovens and heat and drying systems.
- Measurement, regulation, automation, security and local or remote monitoring of these processes.
- Optimisation of safety regulations for pressure equipment, equipment containing liquid or gaseous fuel, or electrical equipment in hazardous areas: ISPEL, CE, CE/PED, ASME, U-STAMPED, FM GLOBAL, BRITISH STANDARDS, ISO/DIN, IEC/CEI, CE ATEX, etc.

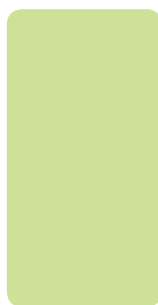
In 1998, Amarc Technologies was established, its aim being to harness the considerable experience gained

in the industrial heating and process control industry since 1950, and to consolidate and turn this expertise into reproducible scientific and technological principles.

During this time, the company partnered leading Italian and foreign companies in developing research projects, up to the construction and installation of components, machines and plants, which also involved the registration of some international patents.

More recently, the company became involved, for some applications, in district heating - a technology which is barely known or developed, at least in Italy.

After several years of testing and operations, the company decided to invest heavily in this sector, and above all in technical product and production process development, as well as in automatic control and supervision systems.





OUR MISSION

With a practical and determined approach that has always set us apart, with expertise and innovation as the bedrock of our company, and with the enthusiasm of our team and a strong belief in our values, we work each day to create a better environment, manufacturing reliable, quality, hi-tech and excellently designed products, to be an industry leader in Italy and abroad.

OUR VALUES



We believe that mankind must believe in something before acting. Our ideals are the guiding force taking us to our destination.

We believe that an awareness of limitations and weaknesses makes man free to choose and to decide with dignity and serenity which approach to take.

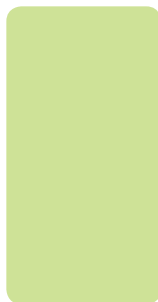
We believe that results for our customers, our employees

and for all people around us do not depend on what we know but on how much we are willing to learn at any time, in every situation, at any age.

We believe that behaving honestly and with sincerity can be tough but, ultimately, it pays back as far as peace of mind and concrete results are concerned.

We believe it is a duty and a pleasure to ensure all our actions are focussed on the environment, on creating, rather than destroying and wearing out, what is made by others.

We believe people must not be judged by their qualifications, positions or successes, but by the dignity in their actions.





Expertise and innovation are the bedrock of our company, and this is why our organisation is based fundamentally on highly professional engineers capable of managing technological and methodological processes above all else.

We train and encourage our employees to increase their knowledge beyond their own expertise and institutional duties .

In particular, knowledge focused on processes but also on the core technologies of mechanical and electrical processing, thermal treatment and the physics of materials, measurements and automatic controls.

We manage all special areas with company resources from a project, development, maintenance and organisational background, while we tend to outsource activities that are well-known, routine, and easy to source and reproduce.

This is why we make sure our staff are trained in managing outsourcers, that are often not homogeneous or located in different areas worldwide.

We believe it is fundamental to have an operating and manufacturing structure that can deal with emergencies, as well as an external operating structure for routine and extraordinary maintenance.

Job orders are always overseen, organised and managed by company staff. We can offer our customers specific skills for their field as well as for other sectors, where can

operate more easily.

Thanks to this organisational model, we are able to lever a technological, organisational and manufacturing flexibility and can operate in different areas, with the best results possible.

We can easily deal with requests for large production volumes in the short-term and for very large volumes in the medium-term, and can also operate with the typical structure of a manufacturing company, if a division for a specific activity is required.

People are the bedrock of our company

Our staff have an average age of 30 and our objective is to recruit at least two young employees to the company each year. We are also supported by the wisdom and experience of our more senior staff. We let younger members of staff configure and coordinate work, drawing on their enthusiasm and technical skills, and giving them practical experience.





Amarc DHP

District Heating Power Plant

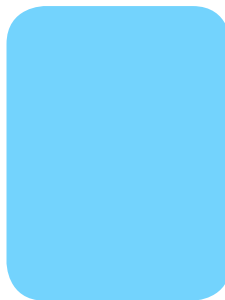
Development, design and construction of energy production plants combined with district heating systems.
(0.5-25 Mwel) (5-150 Mw thermal)





Amarc DHP (District Heating Power Plant) is engaged in the design, construction, start-up and possible support in the operation and maintenance of electricity and/or thermal power plants combined with district heating systems (0.5-25 Mwe) (5-150 Mwt), in particular:

- Simple cycle gas cogeneration plants
- Combined cycle gas cogeneration plants
- Steam heat exchange plants
- Biomass thermal power plants
- Steam or ORG Rankine cycle biomass thermal power plants
-
- Otto cycle gas cogeneration groups from 150 to 2000 kWel
- Pumping groups for district heating plants
- Expansion systems for district heating networks
- Thermal storage systems for district heating plants
- Automation, regulation and supervision systems
- Central unit, network and substation management, operation and optimisation systems
- Continuous flue gas analysis systems
- Revamping, integration and modification of existing plants
- Water pipe and flue pipe recovery boilers for hot water, super-heated water and steam





DISTRICT HEATING POWER PLANTS

natural gas
cogeneration



LOMBARDIA¹
LOMBARDIA²
LOMBARDIA³

Natural gas cogeneration plants
(simple or combined Joule cycle)



PIEMONTE¹
PIEMONTE²
PIEMONTE³

Natural gas cogeneration plants
(simple or combined Otto cycle)



biomass
cogeneration



BRIANZA

Biomass gas cogeneration plants
(Rankine steam cycle)



TRENTINO¹
TRENTINO²
TRENTINO³

Biomass gas cogeneration plants
(organic Rankine cycle)



bleeding



LAZIO

Thermal energy production plants for
bleed district heating systems



emergency





















ROSENHEIM

Mobile emergency plants for district
heating systems





PACKAGE DISTRICT HEATING SYSTEMS

Boilers		MONZA	Supplementary and/or emergency boilers	
		BRESCIA¹ BRESCIA²	Hot and/or superheated water flue gas recovery boiler	
shell and tube heat exchanger		NOVARA¹ NOVARA²	Hot and/or superheated water shell and tube heat exchangers	
pumping systems		ROMA	Modular pumping units for hot and/or superheated water district heating systems	
expansion systems		VERONA¹ VERONA²	Expansion systems for hot and/or superheated water district heating networks	
thermal storage		TRIESTE¹ TRIESTE²	Thermal storage systems for hot and/or superheated water	
filtration		BERGAMO	Filtration groups for district heating networks	
flue gas analysis system		COMO¹ COMO²	Flue gas analysis system	
management system		LIBERO1000	Specialised management and supervision system for district heating plants	



Amarc INDUSTRY

The Amarc INDUSTRY division exploits the experience of Amarc Technologies in the industrial heating sector and is engaged in the development, design, construction, installation and possible operation and maintenance of: industrial heating process components, machines and regulation and control systems.





HEAT EX-CHANGERS

- Electric heat exchangers up to 800°C
- Shell and tube heat exchangers



ELECTRIC BOILERS

- Electric boilers for industrial use



CONTROL PANELS

- Resistive electric load control, regulation and modulation panels
- Regulation, command, control and safety panels



OVENS

- High temperature electric ovens up to 2000°C
- Drying and curing ovens



TEMPERATURE CONTROL SYSTEMS

- Heating and temperature control package for industrial steam, diathermic oil and super-heated water processes
- Hot-air generators



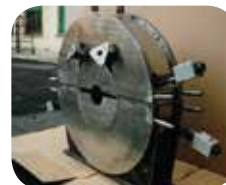
PLANT REVAMPING

- Updating and modernisation of existing plants



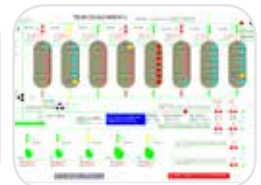
SPECIAL CONSTRUCTIONS

- Thermal sublimation ovens
- Vulcanization line ovens
- Laboratory ovens and technologies
- Fibre optic compacting ovens



MANAGEMENT

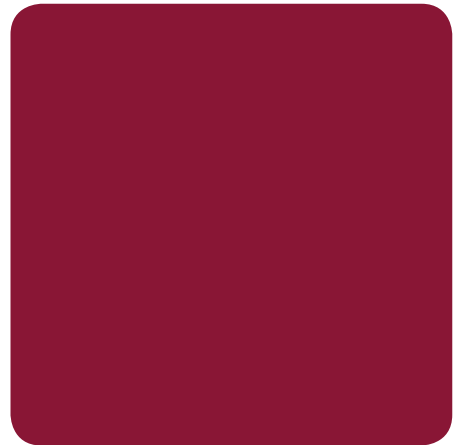
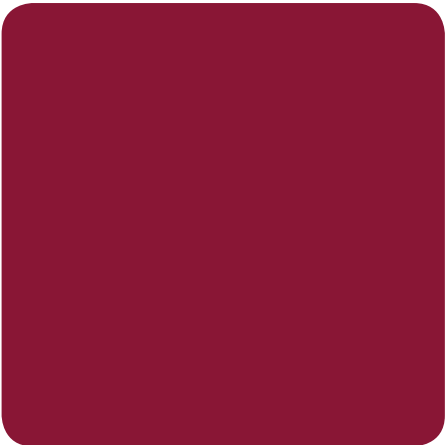
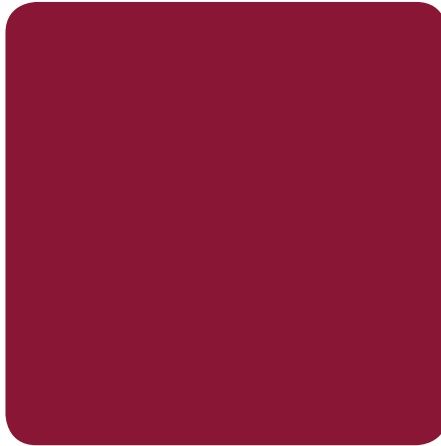
- Automation, regulation and supervision systems





Amarc RENEWABLES

AMARC DHP RENEWABLES DIVISION designs and builds machines and plants in the fields of renewables energy, photovoltaics, biomass cogeneration (CHP), wind, hydro and solar thermal power (CSP).





In the renewables field, Amarc DHP owns and operates manufacturing technologies in all areas described below. In many of them we are engaged in research and development of innovative solutions and products, some already in advanced testing. At the moment not all the experiences and skills are made available to the market. Some projects have already been realized and some other are under construction in particularly solar, wind and biomass plants. The projects have been realized both as customers' supplies and as our own investments.

THERMAL SOLAR



PHOTOVOLTAICS



BIOMASS COGENERATION



WIND



HYDROELECTRIC





Amarc SYSTEMS

The Amarc SYSTEMS division designs, builds and installs products for: specialized automation, remote control of distributed systems, remote heat meter box reading, building automation, industrial and other systems automation, regulation and control, networking, remote management services, as well as remote control and remote operation, also for third parties.





The Amarc DHP systems division is the natural evolution of the experience acquired in the implementation, operation and especially remote control and remote support of systems and machines built and installed. The fundamental characteristics of Amarc DHP systems can be identified by the following elements:

- The systems are free, open and based on standard components, protocols and software, always free or available, never proprietary.
- Development and implementation of standard modules and well-consolidated logic and operation.
- Ease of use and implementation.
- Particular development of data archiving and logging systems, as well as systems for the analysis of such data.
- Organisation of user and/or plant databases and master data .
- Implementation of existing systems and plants.

SPECIALIZED AUTOMATION



REMOTE READING AND REMOTE CONTROL OF DISTRIBUTED SYSTEMS



REMOTE MANAGEMENT



BUILDING AUTOMATION



NETWORKING



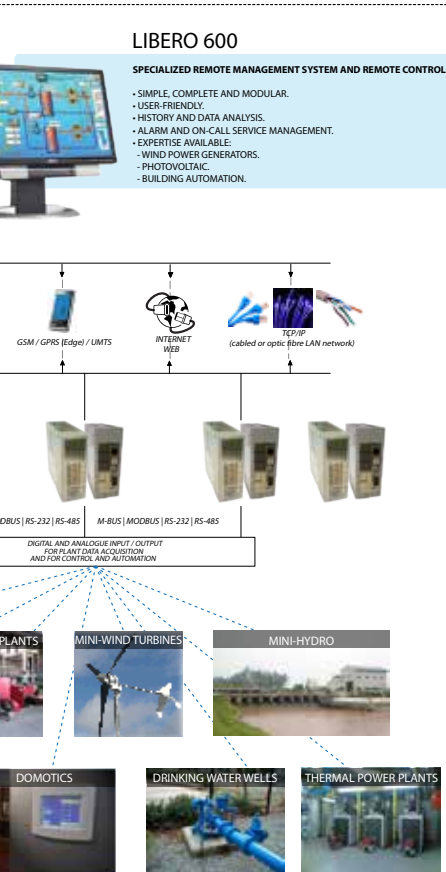
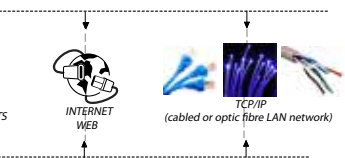




SYSTEM ARCHITECTURE

ING SYSTEMS COVERING LARGE URBAN AREAS

- TOPOGRAPHICAL VIEW OF THE CONTROLLED SYSTEMS.
- OVERALL VIEW OF THE FREELY CONFIGURABLE MAIN PARAMETERS (alarms, operating status, etc.).
- INTEGRATION AND INTERFACE WITH MANAGEMENT SOFTWARE: LIBERO 500, LIBERO 600, LIBERO SCADA, ETC.
- POSSIBILITY TO INTEGRATE AND MANAGE ALREADY INSTALLED SCADA SYSTEMS.
- LARGE QUANTITIES OF DATA ORGANIZED AND MANAGED BY SPECIFIC DATABASES.
- ANALYSIS OF SIGNIFICANT DATA.
- USE OF FREE OR AVAILABLE STANDARD AND UNIFIED PROTOCOLS AND EQUIPMENT.





LIBERO1000

MANAGEMENT SOFTWARE AND SYSTEMS REGISTER

- GRAPHIC AND GEOGRAPHIC IDENTIFICATION
- REGISTRY IDENTIFICATION
- RULING OF DOCUMENTS, CERTIFICATES, USE AND MAINTENANCE MANUALS
- FAST READING OF KEY AND HISTORICAL DATA
- VIDEO CONTROL AND VIDEO SURVEILLANCE
- WEATHER DATA MANAGEMENT



LIBEROALLARMI

IMMEDIATE COMPLIANCE MANAGER OF SYSTEMS OF LABELS AUTOMATIC COLLECTION AND DATA FORMS OF ALL FIELD ALARMS, AND FOR HANDLING ALL THE OTHER LOGS BY OF AVAILABILITY

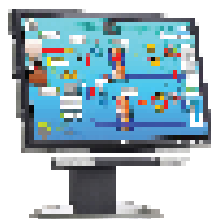


LIBEROANALISI

PROFESSIONAL AND COMPANY DATA ANALYSIS AND REPORTING SYSTEM, AUTOMATIC FUNCTIONALITY OF HISTORICAL DATA ANALYSIS, AUTOMATIC GENERATION OF DETAILED AND VISUALIZED REPORTS



LIBEROS00

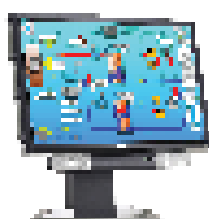


REMOTE READING AND CONTROL SYSTEMS FOR ALL SET AND DISTRIBUTION NETWORKS

- SIMPLE, COMPLETE AND MODULAR
- DATA LOGGING AND ANALYSIS (SMART GRID)
- USER REMOTE CONTROL SYSTEM
- AUTOMATIC READING FORM
- INVOICE FORM



LIBERO600



ARE CALLED TO REMOTE APPLICATIONS BY SYSTEM AND REMOTE CONTROL

- PRECONFIGURED FOR THE MOST WIDESPREAD AREAS OF USE: WIND, PHOTOVOLTAIC, SOLAR THERMAL POWER PLANTS
- EXTREMELY INTUITIVE GRAPHIC INTERFACE AND USER-FRIENDLY
- INTERNET



LIBEROSCADADA

PRODUCT ON PLANT SUPERVISION SYSTEM

- MODULE AND LOGIC ALREADY DEVELOPED IN MANY FIELDS OF APPLICATION
- EXTENSIVE POSSIBILITY OF CUSTOMIZATION FOR EVERY NEED
- USER FRIENDLY 3D GRAPHICS LIBRARY
- INTERNET ACCESS
- IMPLEMENTATION OF ALL PROTOCOLS



PED - CE MARKING

All thermal power plants produced by Amarc DHP srl are compliant with PED standards, under the observation of the Milan department of ISPESL, the organisation authorised to issue certification by EC directive 97/23/CE No. 0100. Applicable modules A, B+C1 and G.

CE/PED - OVERALL

Typical document of certification of conformity for the overall production plant.



ISO 9001

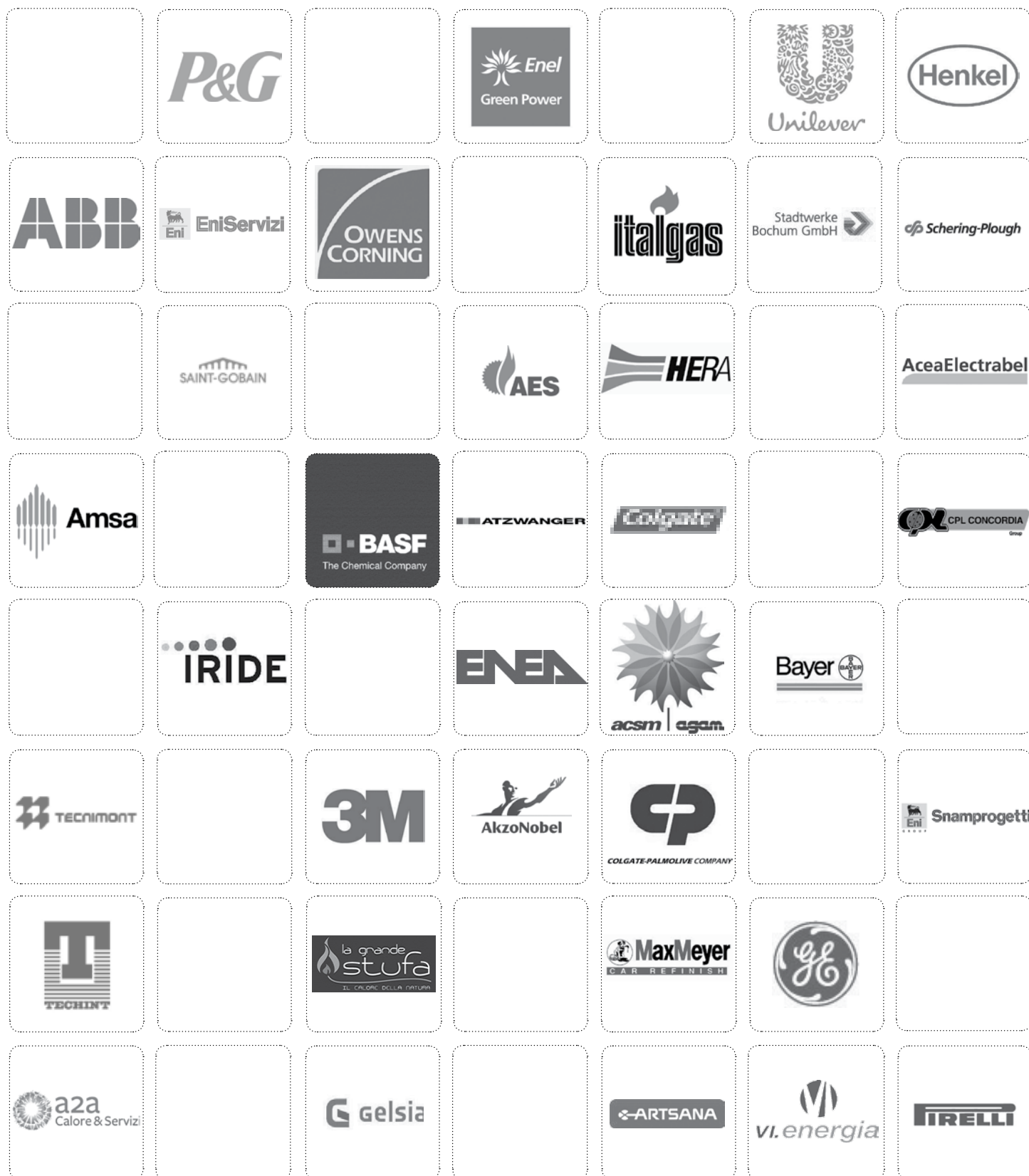
Amarc DHP srl is a company certified in accordance with the requirements of the UNI EN ISO 9001:2008 standard for all company sectors, as well as those of design, construction and maintenance of technological systems for district heating substations.

ISO 14001

Amarc DHP srl is a company certified in accordance with the requirements of the UNI EN ISO 14001:2004 standard for all company sectors, as well as those of design, construction and maintenance of technological systems for district heating substations.

SOA (Qualification to carry out public works)

Amarc DHP srl is SOA certified for participation in public procurement in the categories OG11 class. IV and OG9 class. V.





Amarc DHP uses environmentally friendly and recycled FSC paper

www.amarcdhp.it

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