



AB | Case History

AB FOR SACI

**COGENERATION UPGRADES THE ENERGY
EFFICIENCY AND ECO-SUSTAINABILITY
OF THE PAPER INDUSTRY.**

AB FOR SACI



THE PAPER
INDUSTRY
CONSUMES LOTS
OF ELECTRICITY
AND HEAT IN
THE FORM OF
HOT WATER AND
STEAM.

**SAVING ARE
POSSIBLE.**

COGENERATION IN THE PAPER INDUSTRY.

STEAM AND HOT
WATER ARE
FUNDAMENTAL
IN THE PAPER MILL
PRODUCTION PROCESS.



The SACI paper mill production process can be summed up in four stages: preparation of mixes; fabrication; set up; auxiliary services. The mix preparation stage is crucial and begins with the pulping of the paper to be recycled by means of a special machine (Pulper) into which are introduced bales of "waste paper" and water preheated by the cogeneration plant, thus obtaining a raw mix ready for purging, i.e., the process whereby impurities and pollutants are eliminated.

This is followed by the refining process which determines the quality and specific properties of the paper sheets, made by means of the rubbing together of two metal elements in between which the fibrous suspension is positioned.

In these operations, steam and hot water are fundamental and it is here that cogeneration expresses its full potential – the hot water deriving from endothermic engine cooling is introduced directly into the production cycle, while the very hot exhaust fumes are used to further increase the temperature of the engine water and to obtain steam at operating pressure. The result is greater efficiency and considerable energy saving. In all product production and management stages, right up to storage, the demand for electricity is strong and constant.

Ecomax® ensures the very best performance with utmost continuity and the SACI paper mill can always be sure of having at disposal all the energy it requires.

ATION





CARTIERA SACI: A LEADING EUROPEAN MANUFACTURER OF RECYCLED PAPER.



The SACI paper-mills in Verona were established in 1959. They have passed through all the stages of technical and production development typical of this industrial sector, gradually adapting plants and product range to changing market requirements. Specializing in the manufacture of packaging paper for industrial use, with almost 100% recycling, proved to be a winning move: today SACI is a paper mill of European standing. SACI's success also depends on investments made in cutting-edge technology; hence the decision to develop cogeneration alongside AB.

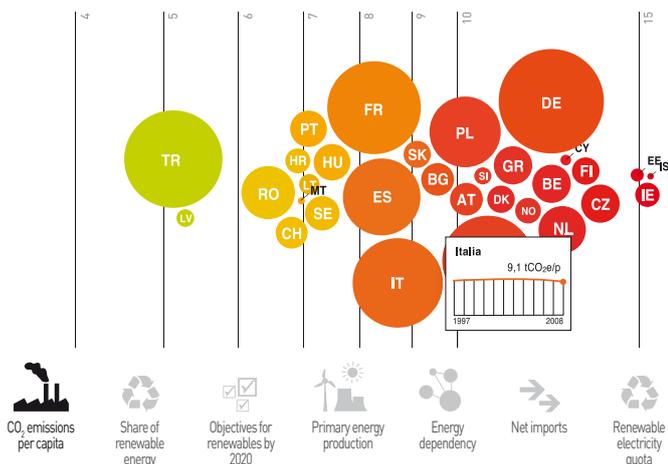


COMBINE EFFICIENCY, PRODUCTIVITY AND CARE FOR THE ENVIRONMENT.



Per capita Greenhouse Gas emissions.

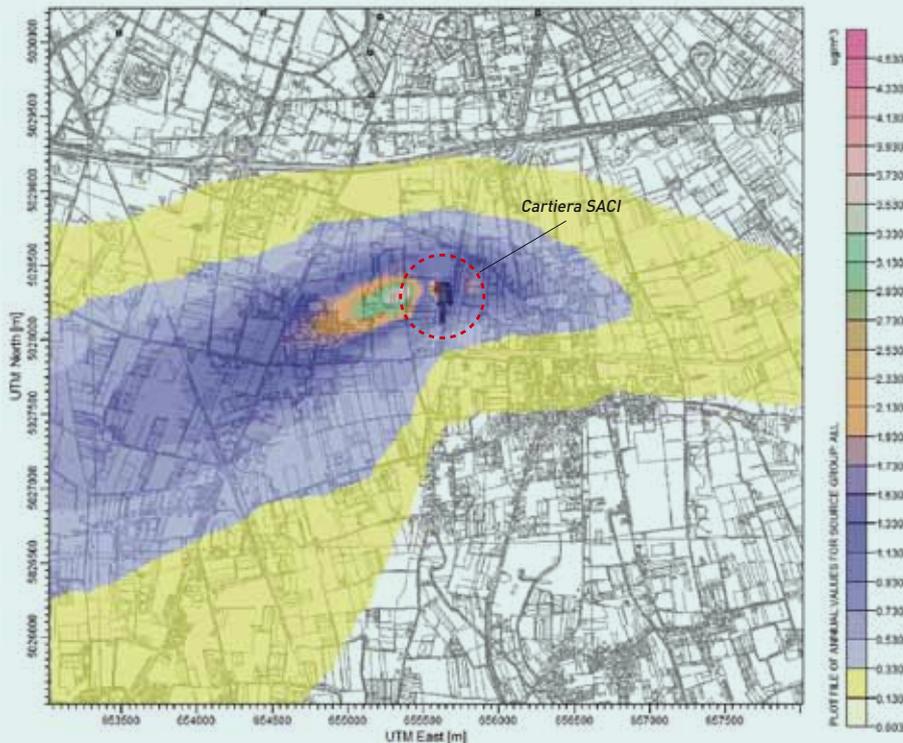
In equivalent tonnes of CO₂ (IEA 2011).



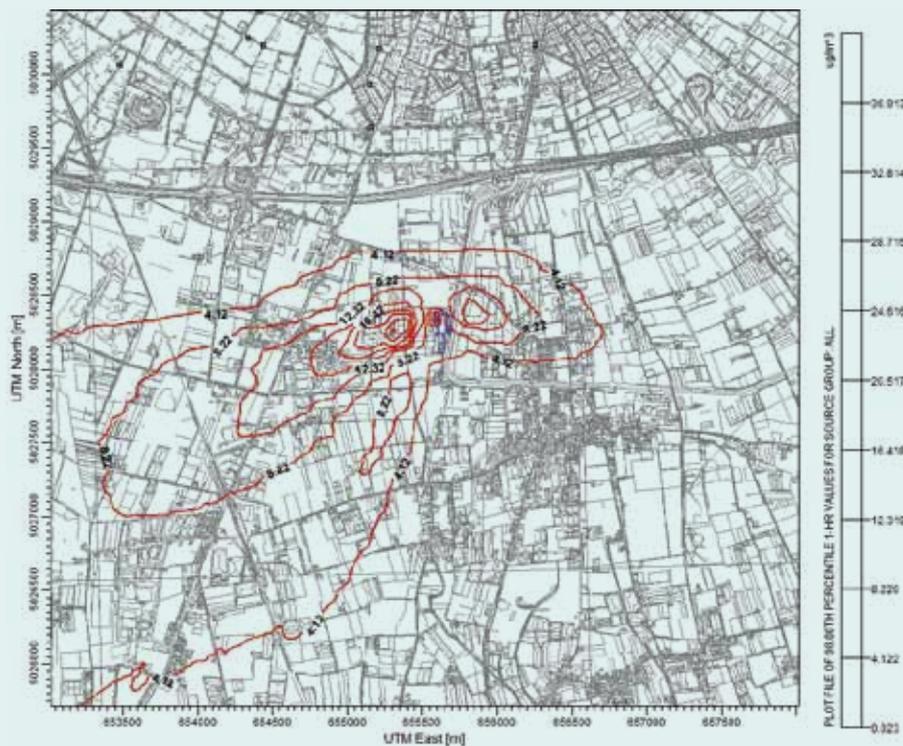
The SACI paper mill of Verona is located in a sensitive environment, distinguished by strong “climatic uniformity”.

The area has very cold winters, hot summers, high levels of humidity all year round and long periods with absence of wind. In such an environment, pollutants remain at length in the atmosphere and quickly build up. A survey carried out into concentrations of air pollutants and a climatic and micro meteorological analysis of the site have in fact evidenced this critical situation. The decision of the SACI paper mill to study environmental conditions – through specialists in the sector – and to acquire cogeneration plants which reduce the quantity of CO₂ introduced into the atmosphere point to a responsible attitude towards the environment and human beings and takes on an ethical value.

DISPERSION OF POLLUTANTS INTO THE ATMOSPHERE. MAXIMUM CONCENTRATION



Concentration of NOx
- scenario 3 -
Mean yearly concentration.



Concentration of NOx
- scenario 3 -
98th percentile distribution,
max hourly.

Scenario 3 (thermal+cogeneration plant, project data).

Pollutant	Mean yearly point of maximum local concentration	Hourly maximum [µg/m3]	Hourly maximum (98th percentile) [µg/m3]
NOx	4.5	60.75	36.9
Coordinates of point of maximum local concentration	655332 (X) 5028289 (Y)	655382 (X) 5028289 (Y)	

Mean yearly concentration at the point of maximum local concentration and maximum hour concentration in the project configuration (scenario 3).

ECOMAX[®] 27NGS: HIGH PERFORMANCE LEVEL AND UTMOST SERVICE CONTINUITY.



For some time now, SACI has been using a turbine cogeneration unit, but the arrival of Ecomax[®] 27, with a specific configuration set for the characteristics of the facility and the production cycle, has made possible a crucial jump in quality, both as regards the very high performance levels and maximum service continuity. The steam obtained thanks to the heat of the exhaust fumes, which integrates the steam produced by the existing boilers, is used to amalgamate the recycled paper fibres. What is more, the hot water deriving from the cooling of the engine block is further exploited to preheat the process fluids and to heat the environment. The entire cogeneration plant was installed and put into operation in just 60 days from the time of approval by SACI, a job completely managed by the skilled AB personnel and which did not interrupt factory production at all.

ECOMAX[®] 27NGS: the ideal production process choice.

Ecomax[®] is a modular package cogeneration plant, the upshot of the applied research of AB, established in 1997 and which quickly became a technological and quality benchmark for the cogeneration market. Ecomax[®] is a high-performance industrial product, based on principles of versatility, modularity and compactness, which ensures a fast return on investment.

Ecomax[®] does not require building licenses and has numerous advantages: great installation and start-up flexibility and speed, as well as simple inter-connection with already-existing plant engineering systems.

WORKS TIMETABLE

Year	2011																																																													
Month	January				February				March				April				May				June				July				August				September				October				November				December																	
Weeks	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52										
Planning	█																																																													
Factory prefabrication											█																																																			
Comp. of masonry works																			█																																											
Assemblies																							█																																							
Making connections																																			█																											
Start-ups																																							█																							
Continuative operation																																															█															

Ecomax® 27 NGS

PCI natural gas	kWh/Nm ³	9.5
Consumption of natural gas	Nm ³ /h	646
Introduced power	kW	6,139
Dispensed mechanical power	kWe	2,745
Dispensed electric power	kWe	2,681
Recyclable thermal power	kWt	2,265
Thermal power in steam	kWt	889
Steam pressure	bar	5
Steam temperature	°C	158.8
Steam flow rate	kg	1,476
Thermal power in hot water	kWt	1,376
Temperature of water coming out of engine	°C	95
Electrical efficiency	%	43.7
Thermal efficiency	%	37
Total efficiency	%	80



CO₂ not emitted into atmosphere:
~2,700 tonnes/yr.



Crude oil not consumed:
~1,200 tonnes/yr

ECOMAX[®] 27 NGS PERFORMANCE IN THE WORDS OF SACI.



Interview with
Ing. Lorenzo Poli CEO of SACI S.p.A.



What made SACI invest in a cogeneration plant?

Our company has always been closely focused on the environment, and as I often say with a pinch of self-irony: "first of all we produce sustainability and then recycled paper". The environment is also important for employees and associates. After all, our raw material is waste paper and we are therefore part of a process with an intrinsic environmental vocation. Of course we need plenty of energy and heat, also because of the large quantities of hot water and steam required for the production cycle. What is more, we need heat to dry the paper. Hence we have tried to upgrade the energy efficiency of the facility with a new cogeneration plant: we are aware of the benefits, also in terms of cost cutting.

How does the Ecomax® plant integrate in your production process?

The studies we have conducted, including those on environmental impact have shown AB Ecomax® to be the ideal solution. For some years now, we have had a turbine plant and among the possible options we have considered, there was also that of "turbogas"; turbines are an aeronautical concept and require special management.

We prefer solutions which offer us utmost reliability. The thermal plant is crucial for our company's production cycle and it is vital for us that it always runs smoothly.

The rationality of Ecomax® caters to our requirements by perfectly integrating pre-existing technologies, in fact, the old turbine plant and the new endothermic plant are completely synergic and provide very satisfactory results indeed. Thanks to Ecomax, we have achieved

zero balance between acquired energy and used energy. Our current average consumption is 5MW, but we are already planning to increase production and shall therefore need more energy.

That is why we are considering installing a new Ecomax® plant, this time however fuelled by biogas because the water treatment plant – which we recently duplicated – produces biogas; renewable energy in other words, which confirms our vocation for eco-sustainability.

Why did you prefer AB?

Quite frankly, we were looking for an absolutely reliable "System Integrator" because we did not want problems. AB convinced us in terms of organisation and integrity, and because of the frank and constructive dialogue between our two companies. It sometimes occurs with suppliers that, at a certain stage of the relationship, perplexities come to the fore. This was not the case with AB, which proved to be an expert and reliable collaborator, which backs you up from the preliminary project through to plant installation. It also accompanies you through the entire life of the plant with an after-sales and maintenance service able to sustain performance.

AB SETS THE COGENERATION STANDARDS GLOBALLY

AB INDUSTRIAL GROUP HAS BEEN OPERATING FOR OVER 30 YEARS IN THE SECTOR OF COGENERATION AND PROMOTION OF ENERGY FROM RENEWABLE SOURCES.

AB is currently made up of 24 companies and over 500 employees and is a single entity able to manage the entire manufacturing cycle of a cogeneration plant: consultancy, design, production, installation and start-up with a comprehensive service. This has enabled AB to acquire unparalleled know-how, to become acquainted with every product detail and to provide a top-quality and highly-effective after-sales service. The success of AB - which has already designed and built more than 900 plants - stems from ongoing investments in cutting-edge technologies, from the constant training and professional specialisation of all operators and from the development of an absolutely unique engineering

department: a team of over 110 engineers engaged in developing the industry towards the production of increasingly more reliable and higher performance plants. AB cogeneration plants are distinguished by modularity, compactness and ease of transport and cater to the energy requirements of a number of different companies. Outright leader in Italy, AB is also expanding globally: in Spain (2007), in Romania (2009), in Poland (2010), and again with the opening of subsidiaries in Croatia and Serbia (2011). From 2012 AB is in Czech Republic, from 2013 also in the Netherlands, Austria, Brazil, Francia and Canada. From 2014 AB in UK, Germany, USA and Israel and from 2015 in Russia and Turkey too.



AB HOLDING SPA	ITA LY SALES	AB Energy SpA				
	FOREIGN BRANCHES	AB Energy International GmbH	AB Energy España S.L.	AB Energy Romania Srl	KWE Technika Energetyczna Sp. z o.o.	AB Energy Hrvatska d.o.o.
		AB Energy Srbija d.o.o.	AB Energy Česká s.r.o.	AB Energy do Brasil Ltda	Green House Power Netherlands BV	EPS AB Energy Canada Ltd.
		AB Energy (UK) Ltd.	AB Energy Deutschland GmbH	AB Energy Russia	AB Energy Israel Ltd.	AB Energy USA LCC
		AB Energy France	AB Energy Turkey			
	PRODUCTION	AB Plants Srl	AB Power Srl			
	SERVICE	AB Service Srl				
	FINANCING	AB Fin-solution SpA				
	RENEWABLE ENERGY	AB Ambiente Srl				

Cogeneration has proven to be a winning choice, also in other industrial and non-industrial fields, such as food chemical, pharmaceutical, textile, plastic, paper, brick, etc.

700 customers, some of them are:

Amadori, Benetton, BNL, Buitoni, Cartiere Saci, Coca - Cola, Cotonificio Albini, Eridania, Essetunga, Fatro, Ferrero, Felli Color, Galbani, Garda Plast, Granarolo, Gruppo Cremonini, Gruppo Mapei, kraft, Lafarge, Lilly, Martini & Rossi, Nestlé, Orogel, Pastificio Garofalo, Pastificio Rummo, Peroni, Pfizer, Polynt, Spumador, Wienerberger, etc.



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