Excellence is a habit

"Excellence is an art won by training and habituation. We do not act rightly because we have virtue or excellence, but we rather have those because we have acted rightly. We are what we repeatedly do. Excellence, then, is not an act but a habit."

Aristotle (384-322 B.C.), philosopher

Thanks, Ari, for explaining in few words that what we try to do every day is excellence. We put the utmost efforts in doing the right things since 1958, when our Company was founded. Our customers – thanks, folks, we wouldn’t be here without your continuing patronage – have exploited for decades some of our innovative solutions, optimizing their investments in Energy and Water Treatment processes. They came back with more business, and, because of training and habituation, we responded with more right things, repeatedly.

Read in this Cannon News some of the latest results that we have achieved for (and with) our clients in two very competitive and demanding fields: Power and Oils & Gas. The players in this field are all grown-up kids.

they know all the tricks and do not get fooled by marketing hype and advertisements. What they want is a smart, sturdy, reliable piece of mission-critical equipment able to work properly in a harsh environment and under stressful conditions, sometimes in the middle of an emergency. If one fails with them, he does not get a second chance. We got a habit in dealing with these requirements, simply because we practiced a lot with them. This allowed us to reach the highest level of quality in our plants, confirmed by the most prestigious – and demanding – certification authorities.

This reflects in a design and engineering level expressed at the highest levels in this industry, confirmed by repeat orders coming from the most demanding clients and EPCs. This is clearly visible in the great concern that we put in designing environmentally-conscious technologies, confirmed by the tight cooperation that we carry with national, European and international authorities dealing with Environment and sustainable development.

All this means that – be assured – we intend to repeat ourselves for several years to come. Our customers deserve this continuing effort. Because – for them too – excellence is a habit.

Clean water for Taiwan Power Plant

ARTEC Ingegneria has been awarded by CTCSI Corporation, Taiwan, an integrated Waste Water Treatment Plant for the Taiwan Power Company’s Young Hsiao Power Plant in Taiwan.

The Taiwan Power Company (TPC) is a state-owned electric power utility providing electric power to Taiwan and offshore islands of Republic of China.

In order to supply sufficient power with adequate reserve margin for future power demand growth and upgrade power supply safety and stability for people’s livelihoods and the development of business and commerce, TPC has promoted several construction projects of generation, transmission and substation, and distribution.

In particular, in the Tungshiao Power Plant, an existing 1,815 MW gas-fired power plant in Tongxiao Township, Miaoli County, Taiwan, the existing low-efficiency units will be replaced by new ones to satisfy the requirement of power demand growth. The project, carried on by a Consortium of CTCSI Corp. Taiwan with Mitsubishi Heavy Industries, aims to install four 720 MW combined-cycle units. They are scheduled for commercial operation in July 2016, January 2017, July 2017 and January 2018, respectively. CTCSI Corp. is the largest integrated engineering and construction firm in Taiwan, with around 2000 employees.

In the recent years, CTCSI is expanding the engineering experience in refinery, petrochemical, general industrial and power plants, even in environmental protection, energy and transportation throughout the world.

The integrated Waste Water Treatment Plant awarded to ARTEC Ingegneria will handle the waste water of the entire complex thanks to the following subsections:
- Dripping section with CIPs and coalescence filter
- Waste Water treatment with chemical physical plant, clarification, filtration
- Sludge dehydration system with thickener and filter press
- Package-type Sanitary treatment plant

Overall capacity of the system is 150 m³/h. Delivery is scheduled in the fourth quarter of 2015.
BONO keeps the Russian oil flowing in a Transneft pipeline!

One of the most important contracts won by BONO Energia in 2013 has been the supply of 56 thermal oil heaters for a very special application in the oil/gas sector in northern Siberia. A 488 km-long crude oil pipeline between Zapolyarje and Purpe, two Russian locations at the border of the Arctic Circle, will transport crude oil between the two areas. As the crude oil has a high viscosity it must be heated along the line to keep it fluid during transfer, due to the low temperatures in that region, especially in winter time. Forty heaters have been supplied to Russian construction and engineering firm Remeks.

Billions are spent worldwide if you name the currency; it does not matter much... to provide the required means to bring oil from where nature put it up to where mankind is going to use it in clever (and often less smart) ways. The remoteness of the Siberian oil fields is a well-known fact, but the dimensions of the infrastructures required to drill, extract, transport and refine the black gold is sometimes hard to understand - and to believe. A good example of this huge effort is a major pipeline under construction in one of the remotest part of northern Siberia, near the Arctic Circle.

A very harsh environment

This oil stream flows in complex landscape of the northern areas of Yamalo-Nenets independent region: the ground nature includes marshlands, more than 250 km of bogs, taiga, tundra, compact and discontinuous permanent frozen soil; the whole line will cross 21 highways and 90 water barriers, including large rivers as the Pur and the Taz. The working environment is one of the harshest in the world, with incredibly low temperatures that allow for only a few month of efficient work per year. When and the ice melts, the region gets flooded...

The Purpe - Samotlor pipeline section, 429 km, was put in operation in 2011 and already transfers 25 million tons of oil per year. The Zapolyarje - Purpe stream - when finished, in 2016 - will be one of the most important in Siberia, transferring around 45 million tons of crude oil per year along a distance of 488 km. Due to the high viscosity of the oil and to the prevailing freezing temperature of the area, the liquid must be kept at 60°C along the whole pipeline. Every 60 km a series of large pumping and heating stations has been planned, the last of which will go in operation in 2016. In order to cope with the extremely difficult logistic problems and comply with stringent regulations conceived to preserve the surrounding environment, the whole pipeline has been designed to be installed well above the ground level, with special arrangements when crossing lichen areas and waterways.

The relatively higher temperature of the highly insulated 600 mm diameter pipes will not spoil the permafrost areas and all related forms of life.

Special needs, special solutions

The pumping stations are equipped with specially-designed thermal oil heaters connected to large heat exchangers, through which the crude oil flows to be warmed up at 60°C and transferred to the next station.

A part of the order for the special oil heaters was issued on behalf of Transneft (the major Russian oil company) by Remeks, a specialised Moscow-based EPC contractor which is taking care of the integration of BONO Energia heaters into the whole supply. Remeks provides the complete heating units, a series of two-floor containers, 12 meters long, each of them containing two BONO Energia OMV thermal oil heaters mounted back-to-back. The Remeks order to BONO Energia - so far - consisted of 40 multi-tubular OMV heaters with a capacity of 4 megawatts each, equipped with Optispark wireless electronic control system and with dual burners, fuelled by crude oil and natural gas. The choice of a dual-fuel burner is due to the actual need to burn crude oil and the future opportunity to burn natural gas, as the gas line is foreseen in operation two years after start-up.

BONO Energia supplies for this project 56 multi-tubular OMV heaters with a capacity of 4 megawatts each, equipped with Optispark wireless electronic control system and dual burners, fuelled by crude oil and natural gas.

The OMV supplied are, in this case, multi-tubular fluid heaters, in contradiction with the traditional BONO nomenclature which indicates for these units a serpentine coil type. This is due to the original proposal to Remeks, which consisted in serpentine coil units, completely re-designed in order to have small containerised dimensions in combination with possibility of easier maintenance and cleaning operations. The crude oil in fact gets the combustion chamber and the convective section very dirty during operation and could be harmful to the serpentine units; for this reason a compact version of multi-tubular fluid heaters, equipped with boost blowers, has been tailored for this purpose.

As mentioned before, one Remeks container includes two thermal oil units and the whole 488 km pipeline is divided into eight segments with seven stations, in which the crude oil heating and pumping units are located. Every heating station consists of four containers, this means that at least eight BONO OMV heaters are present in each station. In the heating process the crude oil, before pumping, flows through large heat exchangers in which its temperature goes up to 60°C. Each heat exchanger is fed by two OMV units, providing thermal oil fluid at 180°C in order to guarantee the thermal energy to heat the crude oil.

The OMV are designed and manufactured in accordance with the European standards, certified by GOST and equipped with RTN (Rostekhnadzor) permit of use.

To win this project BONO had to face the competition of another European manufacturer who proposed a single 8 megawatt heater for each container, but this proposal was considered to be dimensionally too long, risking dangerous thermal dilations in operation, and poorly redundant for the needs of the application. BONO Energia could also lever on an important reference in the same industry: two OMV units rated 4 megawatt each, supplied to Shell Russia for a similar application, which played a very important role in the final decision. Thanks to an optimized design solution and to the confidence of valuable local engineering partners BONO Energia has been able to secure this important job that foresse the supply of another lot of OMV oil heaters in the near future.

A 488 km-long crude oil pipeline between Zapolyarje and Purpe, two Russian locations at the border of the Arctic Circle, will transfer crude oil between the two areas. As the crude oil has a high viscosity it must be heated along the line to keep it fluid during transfer.

BONO solutions for Pirelli in Russia

Cannon Eurasia, BONO Energia and ARTES Ingegneria cooperate to supply a turn-key thermal plant – producing 75 ton/h of steam at 26 bar – for the Pirelli tyre factory of Voronezh, 500 km south of Moscow, Russia.

The project started when Pirelli, owners of VSZ (Voronezh Shina Zavod), decided to provide an internal source of heat for the vulcanising process that supplies rubber to the truck tyres factory, ending a heat supply contract with the local Voronezh thermal plant. The strategic decision enters in line with the purchase of saturated steam from the municipal source will guarantee a substantial and continuing money saving.

This investment was decided within a wider frame of modernisation, to make the Voronezh site the most advanced of its kind in Russia.

In 2012 the replacement of the whole production equipment was completed, installing the most advanced rubber blending technological solutions with an investment of 56 million Euro.

A new production line was inaugurated at the end of 2012, with the participation of Dimitry Manturov, Russian Federation’s Minister of Industry and Commerce, Alexander Potapov, Governor of the Voronezh region, Sergey Victorovich Chemoezov, General Manager of Russian Technologies and Marco Tronchetti Provera, President of Pirelli.

Auxiliary Boilers, lighting up the power

The “lighter” of a thermal power generation or cogeneration plant is the auxiliary boiler: it provides the steam for the start up of the plant, so reliability is the key factor that drives the client’s choice.

In the last years BONO Energia’s auxiliary boilers have been appreciated by relevant electric utility companies and EPCs contractors as well, such as EDE; Vattenfall, A2A, ENEL, Mitsubishi Heavy Industries, Ansaldo Energia, SNC Lavalin, Foster Wheeler, Technip.

More than 50 auxiliary BONO boilers are working all over the world. One of the current jobs in this field is the supply to the consortium between the Italian Ansaldo Energia and the Canadian SNC-Lavalin that are building in Sousse (Tunisia) a single-shaft combined-cycle power plant with a capacity of around 400 MW.

This project is the "C" stage of the program of the extension of Sousse power station run by STEG.

BONO’s auxiliary boiler will supply 6 t/h of steam at a pressure of 15 bar at a temperature of 350°C, fired both by natural gas and light oil. The scope of the supply includes deaerator, pumps and chemical dosing systems.

The Société Tunisienne de l’Electricité et du Gaz is planning to increase the production capacity of its power plants by more than 1,200 MW by the end of 2016 to face the demand that is forecasted to increase by 5-6%/year until 2016.

The Sousse phase “D”, the construction of a 424 MW gas powered combined cycle thermoelectric power plant next to phase “C”, will be still developed by the Consortium Ansaldo Energia SNC-Lavalin.
Tempra Rossa TOTAL ARTES Ingegneria and BONO Energia contribution

ARTES Ingegneria and BONO Energia are proud of being awarded by Tecnimont for the Tempra Rossa oil field project in the Basilicata region, in southern Italy.

The operator in charge of developing this project is TOTAL, one of the six super major oil companies in the world that operates in more than 130 countries with 97,000 employees. Tecnimont, as the EPC Contractor, is a leading Engineering & Construction company with 4,500 employees in about 30 countries and 45 operating companies. Tecnimont is in charge of the process and utilities units, water and gas treatment, LPG storage, surface facilities on the well pads and the connections of the flow lines and pipelines to the gas distribution network and Taranto’s Refinery.

The EPC contractor found at Cannon a complete proposal that covers an important part of its scope of supply: both water treatment and steam for the process and utilities. This oil field – located in the region of Basilicata, in southern Italy is the biggest onshore reserve in Europe. The production will begin in 2016 and it is expected to produce 50 kbd of oil, 230,000 m³ of natural gas, 240 tons/d of LPG, and 80 tons/d of sulphur.

TOTAL is developing this site, implementing the most appropriate oil industry techniques for exploration and production.

Water and Steam for an oil field

For the Tempra Rossa project ARTES Ingegneria supplies a complete Effluent Water treatment plant. The key technologies are dealing with the removal of oil and suspended solids from the water. Firstly a Corrugated Plate Interceptor (CPI) removes oil particles at the top through a skimmer, whereas solids are removed from the bottom, thanks to the specific structure which employs a series of corrugated plate packs inclined at reverse angles in close proximity. Downstream the CPI, an Induced Gas Flotation (IGF) system removes up to 95% of free oil. The target of this secondary treatment is the removal of dispersed oil droplets greater than 20μm. In this technology small bubbles of gas rise through oil-contaminated water cling to oil droplets, accelerating their path to the surface where the oil layer builds up, and is skimmed off. Media filtration and adsorption on Granular Activated Carbon are further implemented to reduce residual suspended solids and oil to negligible values. The capacity of the overall waste water treatment is about 1,000 m³/day.

These technologies are, as well, the best fitting solutions in the treatment of produced water, where the effectiveness of the separation of dispersed and dissolved oil is fundamental. Furthermore, BONO Energia supplies three water tube steam boilers (CTD 10); each boiler will produce 30 t/h steam at a pressure of 45 barg and a temperature of 440°C, firing natural gas as fuel. The boilers provide the steam for the process (gas treatment), for the utilities and in support of the energy production for the site.

An expert support

BONO Energia has more than 50 references in auxiliary applications, where reliability is the key factor that drives the client’s choice: the boiler provides the steam for the start-up of the plant and the peak load occurs. Since the feed water quality is important for the heat transfer efficiency of the boilers, preventing corrosion and deposition of precipitated scale, BONO Energia’s boilers are equipped of the demineralization package provided by ARTES Ingegneria.

Tempra Rossa oil field is special not only because of the nature of the hydrocarbons, but also for its environmental context. It extends over a geological region with a complex hydrogeological network.

The development of such an oil field is a challenge that TOTAL and its partner have accepted, implementing the most appropriate oil industry techniques for exploration and production, in order to respect the environment and nature. ARTES Ingegneria and BONO Energia bring their gained experience in this field, providing the best solutions along with the client’s need.

More offshore jobs for ARTES

Produced water treatment package for an oil rig off-shore Abu Dhabi

Abu Dhabi Marine Operating Company, ADMA-OPCO in brief, is a major producer of oil and gas from the offshore areas of the Emirate of Abu Dhabi.

The Company prides itself in being a pioneering petroleum organisation in this part of the world, having completed over 45 years of oil and gas production. ADMA-OPCO operates major oilfields - Umm Shaif and Zakum. The operations are centered on producing oil and gas from these fields, and transferring the crude through a sophisticated pipeline network to Das Island for processing, storing and exporting. The collection and treatment processes of oil and gas are executed by utilizing giant structures, installed in the field in the 1960s and 1970s, and are called Supercomplexes. These complexes comprise modern plants and platforms and are firmly placed in the sea like man-made islands. Similar structures are mounted at the Satbat Al Razboot Oil Field Development, off-shore Abu Dhabi. Here, as in the other drilling rigs and wellworking, a huge quantity of produced water comes to the surface blended with oil and natural gas, and contains numerous gaseous and solid substances that must carefully removed before being re-injected in a disposal well.

ARTES Ingegneria won a contract, through Hyundai E&C Korea, for the supply of a complete produced water treatment plant to be installed offshore.

With the ARTES solution the extracted oil is first separated from water with hydrocyclones, then the gaseous phase is separated by lowering the pressure in two degassing units. Water is filtered and pumped back underground in a disposal well.

The plant capacity demanded by the specifications is 331 m³/h of produced water, corresponding to 50,000 barrels a day.

What should be noted is the great care spent in selecting for this plant the highest quality metals and components: the whole piping and the internal cladding of the vessels are made in Inconel 625, an alloy containing 58% of Nickel, plus Chromium, Molybdenum, Niobium, Tantalum and other metals that make it extremely resistant to oxidation and corrosion, two characteristics of these produced water that contain an extremely high concentration of Chloride and Hydrogen Sulphide. The compactness demanded to any piece of equipment subject to work on an off-shore platform required a special designer’s effort in packing a high number of treatment components in the minimum space.

The preassembled modules will be mounted on skids and modularised in the construction yard, with an empty area left available in order to allow for a future modular expansion of the treatment plant.

The whole order will be delivered within 2014.

Dedicated solutions for off-shore oil fields of Petronas and Shell in Malaysia

Two important names have just been added to the long reference list of ARTES Ingegneria: Petronas and Shell will receive its water treatment plants for their rigs off-shore Malaysia. Technip MMHE, the Joint Venture of Technip Geoproduction in Kuala Lumpur and Malaysian Marine Heavy Engineering, as EPC contractor awarded ARTES again with important contracts for the treatment of sea water destined to two different oil fields.

Petronas will install a sea water desalination plant and a drinking water unit for a large platform. Several technologies are used in this case: media filtration, chemical conditioning, Reverse Osmosis and remineralisation. The sophisticated solution will provide 50 m³/day of fresh water for both human and industrial use on-board the platform.

Shell needed for one of their oil rigs in Malakai oil field a sea water treatment plant for the production of demineralized water for process use. Their plant will include the use of membrane-based reverse osmosis and electrodeionisation. The capacity of this unit is of 200 m³/day.

Both plants will be built on modular skids, to optimise the use of space in the tight volumes allowed on an off-shore platform and to simplify the installation phase. Their delivery is planned within 2014.
District Heating: Bono will install new plants for A2A in Brescia

The district heating network of A2A in Brescia is the most important example of district heating in Italy. These new CHP boilers supplied by BONO Energia will add 240 megawatts of thermal power to this plant, complementing during peak hours the heat supplied by the local waste-to-energy plant and by the multi-fuel cogenerating unit.

BONO Energia will supply to A2A Calore & Servizi three natural gas heat generators for their District Heating Plant “Lamarmora” located in Brescia, northern Italy. These units, rated 240 megawatts in total, are going to replace two old heavy fuel oil-fired boilers and one old natural-gas boiler, thus contributing the environmental quality improvement of the town. The order confirms the trust of a large energy producer in the solutions for district heating supplied by BONO Energia, a leading provider of large thermal plants.

We interview Paolo Bugatti, BONO Energia Engineering Division Manager, about this important achievement.

Cannon News: Can you summarise for our readers the activity of A2A in the field of district heating, in particular for their Brescia network?

Paolo Bugatti: The A2A “Lamarmora” plant in Brescia represents the most consolidated district heating experience in Italy. Since 1972 this Lombard city started a centralised heating project: the experience soon moved from a small, and peripheral neighbourhood to the rest of the city, that counts today almost 200,000 inhabitants. Between 1978 and 1981 new heat generators were added to the original ones, allowing for the cogeneration of electricity. In 1987 a new multi-fuel unit was started, able to burn – also in mixed combustion mode – coal, heavy fuel oil and natural gas.

Between 1998 and 2004 A2A connected this plant with a waste-to-energy plant, recovering all the thermal energy from those waste materials that could not be recovered with other methods. Two thirds of the town and some confining boroughs are today served from this district heating network.

Cannon News: What is happening now with this plant?

Paolo Bugatti: A2A Calore & Servizi Spa, the owners of both the power plant and the distribution network, planned now the replacement of two old heavy fuel oil-fired boilers and one old natural-gas boiler, installing three new natural gas-fired generators to integrate the important thermal load provided by the waste incinerator and by the multi-fuel cogeneration units. We have been cooperating with the A2A Group companies for many years installing important thermal units in Milano, Brescia, Bergamo and Sesto San Giovanni. BONO Energia was granted a large order for this turn-key package supply. The contract includes three 80-megawatt CHP units, for a total installed power of 240 megawatt.

The new generators will provide the required thermal energy to the network in the peak hours, when the heat from waste-to-energy plant and from the multi-fuel cogenerating unit is not sufficient to face the demand.

Cannon News: What benefits will derive from this change?

Paolo Bugatti: Natural gas will be burned in new boilers, able to perform high quality for environmental control. All the spaces originally devoted to the storage of heavy fuel oil will be recovered and utilised for the installation of the three new generators supplied by BONO Energia.

Cannon News: How do you plan to proceed with this large construction program?

Paolo Bugatti: The construction of the three CHP units will be executed in a modular way in our plant in Peschiera Borromeo, near Milan. The pre-built modules will be transported to Brescia and assembled in situ, completing the construction with all the required insulation and accessory structures. The delivery of the new generators is foreseen for October 2014, while the plant will start up its activity twelve month later, by the end of 2015.

BONO solutions for Pirelli in Russia

Within 2015 a further investment of 44 million Euro is foreseen, to increase the production capacity of the plant to 4 million truck tyres per year. The turn key thermal plant supplied by BONO will be completed by the first half of 2014. For the Pirelli Russia project ARTES Ingegneria, specialised in water and waste water treatment plants, is supplying the feed water treatment equipment, composed by a reverse osmosis section and two degassing units. BONO Energia supplies the complete thermal plant, composed by three water tube boilers – featuring a total capacity of 53 megawatts – fully integrated with the water treatment section supplied by ARTES.

The cooperation between BONO Energia and a local Project Institute – charged with the task of aligning the project details with the stringent Russian norms - allows to transform the space made available by Pirelli in a completely functioning thermal plant. A fundamental role in this achievement is played by Cannon Eurasia, the Moscow-based Cannon subsidiary holding a SRO (Self-Regulatory Organization) licence that allows them to sell and install turn-key plants on the whole Russian territory.

ARTES Ingegneria, specialised in water and waste water treatment plants, is supplying the feed water treatment equipment, composed by a reverse osmosis section and two degassing units.

The project’s details

The saturated steam production line consists of three water tube boilers producing 25 ton/h of steam at a design pressure of 20 bar, to guarantee a steady supply to the working islands at 21 bar. The boilers are equipped with a heat recovery system that transfers the thermal energy still present in the exhaust fumes to an heat exchanger installed on the water feeding line: this allows for an effective efficiency rate of the boilers higher than 95%, at full charge.

The thermal plant’s electronic control system, designed and built by BONO Energia, also handles the water treatment functions of the ARTES Ingegneria section. One of its most interesting features is the possibility to balance automatically the load of the three boilers in accordance with the demand of the production departments.

A further reduction of the running costs is obtained by using inverters on all the pump’s electric motors and on the fans of the boiler’s burners, and by controlling continuously the critical points of the process through a network of sensors.

The reverse osmosis group supplied by ARTES Ingegneria has been designed to treat 50 ton/h of water coming from the Don river. The supply includes an in-line pre-treatment section with two filters and one disinfection unit, designed for a wide range of potential polluting substances.

The demineralisation process is engineered targeting the highest possible level of recovery (75%) while guaranteeing the water quality at a conductivity value around 20 microelements, required for the perfect operation of the boilers.

This solution guarantees the highest reliability in combination with low running and maintenance costs.

The presence of two parallel-operating lines ensures smooth operations also during maintenance.

The Oxygen removal ARTES Ingegneria supplies two thermo-physical deaerators able to produce 75 ton/h of degassed water. The patented Spray&Tray technology – developed internally, whose name derives from the special jets used to pulverise the incoming water and from the inner design of the tower where the thermal and phase exchange occur – allows to obtain an excellent level of extraction of O2 and CO2 from the feed water, reaching a minimum concentration of 5 ppb of O2.

PIRELLI and BONO, a long history of cooperation

This Russian project reinforces a consolidated relation between Pirelli Tyre and BONO, that already counts – among the latest supplies – a water tube CTD unit rated 30 ton/h of steam for the car tyres plant in Alessandria, Egypt, and another 25 ton/h CTD for the Turin factory in Italy.

The three Cannon Group companies – Cannon Eurasia, BONO Energia and ARTES Ingegneria – cooperated very efficiently to win this important contract. The delivery of the new multi-fuel once more an internationalisation strategy that targets the diffusion of the BONO and ARTES brands in fast-growing markets, taking full advantage of the market knowledge matured from the local Cannon units operating since very many years in the Polyurethane and plastics business.
Drilling for Oil in Austria

An old oil field in Austria produces around twenty barrels of water per each barrel of extracted oil. OMV, the Austrian Oil Company exploiting this site, decided to take advantage of this huge quantity of water by pumping it back underground to increase the rate of oil extraction. ARTEs Ingenieria helps, supplying a produced water treatment plant.

The OMV Schoenkirchen site, located north of Wien, Austria, required a dedicated plant to treat 250,000 barrels of produced water, extra produced water, extracted together with oil from an aging oil field. The intention is to pump this water back under pressure, deep underground, to help the remaining oil to come to the surface. This well-known technique, called “water flooding”, requires very clean water, in order not to block with sediments the small cavities in the deep rock that contain the droplets of viscous oil. ARTEs Ingenieria supplied a dedicated desalting and filtration solution able to treat 1,650 m³/hour of water (equivalent to 250,000 barrels a day) up to a very high level of purity from suspended solids and emulsified oil. To obtain this result five cylindrical 4-meter large walnut shell filters were used, containing finely ground walnut shells as filtration media. These highly porous, mechanically resistant wood particles constitute a unique filtering material, able to trap the finest droplet of oil and all the solid particles (clay, sand, whatever) in the billions of microscopic cavities built in the nut shells. A major advantage deriving from their use is the possibility to regenerate the filtration bed by means of an effective fluidisation, without spoiling their structure because of the abrasive effect of the circulation pump and separation scrubber.

Cannon solutions for district heating plants

- Superheated water generators CTH (up to 40 MW package configuration 100 MW field erected)
- Fire tube steam/hot water generators SG (up to 15 MW package configuration)
- Water tube steam/hot water generators CT (up to 40 MW package configuration) 100 MW field erected)
- Heat recovery modular boilers/heaters from gas turbines or engines CTR (up to 50 MW)
- Biomass fired boilers/heaters (up to 40 MW)
- Water treatment plants for primary waters as well as for sewage.
- Heat pumps or cooling systems with co-players.
- Polyurethane heat insulation systems for network pipelines with Cannon foaming equipment.

**Cannon & District Heating: a wide experience in energy networks**

Cannon, through BONO Energia – the daughter company devoted to thermal plants - have matured a long experience in the district heating market segment, having developed dedicated heat generation units.

Numerous large machines have been installed in the past ten years in Italy and other countries, serving the heating networks built by municipal authorities, airports and large communities.

BONO Energia counts on several important references in the district-heating sector: plants have been installed in Italy, France, Switzerland, Kazakhstan, Vietnam, etc. The most popular type of equipment supplied for this challenging application is based on a heater solution named CTH, a multi-tubular water tube design: these heat generators can be installed directly on the district heating networks – where network hot water circulates directly in the CTH tubes – or through heat exchangers, depending on water characteristics.

Having no practical limitation on the pressure design, that can reach values higher than 40 bar, and on hot water inlet temperature, limited only for the pipe gas temperature consideration, the CTH have been extensively installed in many large Italian district heating applications.

Main advantages offered by CTH design are connected to the package configuration – they are shop assembled up to 40 MW – and to their quick response time to load variation. Furthermore the possibility for shop prefabrication of many parts of the heaters in a modular concept provides for very short delivery and installation times for field erected units (up to 80 MW).

Simplicity of the water treatment, elimination of the thermo physical deserialization, rationalization of the primary and secondary water distribution lines are also important aspects to be taken into consideration.

**HRSG - recovering waste heat from power generation to feed the airport thermal conditioning systems**

An airport is a complex system of buildings and facilities with costs comparable to, if no higher than those of major sea ports and definitely more difficult to manage. Good temperature-conditioning in lounges, offices and areas devoted to passenger services is key to ease the tension of long waiting hours and to provide a pleasant break for those who are required by their business schedule to spend the day at the airport.

Three major airport terminals in Italy (Milano Linate, Milano Malpensa, Roma Fiumicino) are demonstrating the Cannon Group capability to focus on advanced technological solutions in the district heating.

Specifically, the air-conditioning system of Milano Malpensa is driven by a BONO Energia thermal station with an installed capacity of 46 MW, roughly equal to the amount of power used by a city district composed of 2,500 medium-sized flats. BONO Energia has supplied two gas-turbine recovery boilers to produce superheated water at 150°C that is transferred to a thermal cycle to provide heating/conditioning to all airport facilities.

BONO Energia has also supplied the district heating plant for Roma Fiumicino international airport, which requires an overall capacity of 50 MW.

Superheated water at 150°C, with a return temperature of 90°C, is distributed by a network of pressurised systems at 16 bar. The availability of sophisticated electronic controls, developed by BONO and AUTOMATA, the Cannon Group division in charge of industrial electronics, has enriched the portfolio of products offered by BONO Energia and contributed to achieve significant results in the supply of complex technologies to the utility companies managing the energy networks of important communities during these years.

**A2A district heating in Milano, Italy - Canavese Plant**

This 40 MW plant for A2A supplies hot water to the district heating network of Sesto San Giovanni, near Milan, Italy.

High efficiency, low emissions, competitive cost

The thermal efficiency up to 95/96 % and ultra low emission levels [100 mg/m³ of NOx levels @ 3% of Oxygen in the flue gases] are absolutely significant in the emission reduction as required by Kyoto Protocol. With a very simple design involving a reduced number of components, the CTH generators have a competitive price for a wide threshold range starting from about 10MW.

For all these reasons this BONO thermal machine has become a preferred solution for the important district heating plants operated by utility companies in various Italian cities (A2A in Milano, Bergamo, Brescia) and airports (Milano Malpensa and Linate, and Roma Fiumicino).

Even the CERN (European Centre for Nuclear Research) large compound of offices and laboratories in Geneva has been provided with BONO district heating solutions!

Stringent emission levels have always been a “must have” specification from the utility companies, facing tough daily exams from the public opinion and environmentalist groups, always keen in keeping them under a strict scrutiny for emissions and pollution.

The law-permitted limits, valid at the time of starting a new plant, are always drastically cut by the client, in order to be safe with their emissions also in the future, when those limits will be more restrictive.

BONO always complied with the imposed specifications, combining high thermal efficiency and low emissions.
Wood scrap to replace gas in a large tissue factory

A leading Italian producer of paper and its derivatives, present worldwide with production plants and offices, commissioned to BONO Sistemi the design and construction of a 13-megawatt thermal plant fed with wood scrap, destined to their French production site.

This biomass unit replaces the existing gas heating plant, confirming the customer’s engagement in selecting only renewable sources for their production of thermal energy.

The paper industry is notoriously very “energy hungry”, requiring large quantities of medium pressure steam to operate the production lines that deliver “tissue” around the clock for not less than 340 days a year.

The final product is then used for various applications, ranging from napkins to toilet tissue, from kitchen towels to facial tissue. These production lines – in order to be profitable at the end of the year – must run continuously and without any interruption.

The steam generator that BONO Sistemi is providing to the French factory of a leading tissue-manufacturing Italian group responds to the stringent requirements in terms of reliability and continuity in operation.

The supply includes a steam boiler certified for unattended operation, running up to 72 hours, a complete exhausts treatment system up to the chimney, the ash removal and transport unit, a biomass feeding system composed of a feeding hopper with a capacity of 1,000 m³ for an autonomy of 72 hours, a complete water treatment and degassing unit for the boiler’s feed water, the electrical and control cabinets, all water and steam piping network up to the points of use.

The new biomass-fed plant allows the customer to save more than 560 m³/hour of natural gas, equivalent to more than 7.5 million cubic meters per year.

BONO Sistemi – holding more than 50 years of experience and over 60 plants worldwide – is a leading supplier of biomass-fed steam generators and thermal oil heaters. Their technological solutions are particularly appreciated by the industries processing food, wood and pulp, paper and derivatives: a large quantity of process scrap – such as olive waste, rice and various seed's husk, wood chips and trimmings, plywood scrap, bark and sawdust – represents both a substantial disposal problem and a valuable source of energy. BONO Sistemi provides suitable solutions to fully recover these by-products transforming them in a source of energy – always available and free of charge!

Bespoke turn-key solutions, including civil works, can be designed for any of the above renewable types of fuel, not excluding the possibility to recover energy from other types of natural combustible substances.

Panguaneta, plywood for life!

Panguaneta is an Italian company specialised in the production of plywood panels, marine plywood and poplar multilayer boards. Operating in Sabbioneta, near Mantua, the company owns a vast area and cultivates poplars using state-of-the-art farming technologies. A relevant portion of their raw material - the wood unusable for their boards - has always been used to supply the heat required by the process. A new BONO Sistemi solution will now improve the efficiency of this energy recovery activity.

The Panguaneta reality

Traditionally dealing with the processing and manufacturing of plywood and chipboards, over the years Panguaneta has become one of the most important European companies of the sector, thanks to the expansion of its product range and the industrial sectors served. On the eve of a new and even more important expansion, today Panguaneta occupies a surface of 160,000 m², 30,000 of which are covered.

The traditional Panguaneta product is plywood from poplar veneers, obtained by a wood-based natural panel of rectangular shape that derives from the supersposition of at least three layers of wood veneers, whose cutting is carried out on poplars after bark stripping. This operation, performed through a particular tangential cut of the trunk, allows to convert it into a thin continuous film of wood.

This layer is then converted into sheets with the desired size and dried. All the unusable wood (bark, beginning- and end-of-peeking residuals, branches and scrap from forestry maintenance) has always constituted a valuable combustible, used to generate steam and heat for the plywood pressing process. Within the frame of the continuing upgrading of the company technological resources, Panguaneta owners selected BONO Sistemi as the supplier of their new biomass-fed thermal plant.

A dedication to poplar products

The Po valley represents today the most advanced farming and industrial area in Italy. Right near its middle course, not far from the confluence of the river Oglio, once upon a time there was a small coastal village called Panguaneta. From there, the ancestors of the family still owner of the plywood company moved to Sabbioneta when the river Po changed its course, submerging the village once and for all. Like poplars have roots submerged in high water beds, the company founders – four local families with parental links – found it significant to pay homage to their own roots, submerged in water too. This way, Panguaneta, today a leading company in the production of poplar products, was established in 1960.

The high historical, artistic and environmental vocation.

The Panguaneta heritage is inscribed in the World Heritage List by UNESCO in 2008. Its walls surround a sixteen-century masterpiece, the ideal city dream of by Vespasiano Gonzaga, the Prince of Mantua.

The Panguaneta factory stands and has expanded over the years south of the walls, parallel to the ancient road leading to Mantua from the Parma region. This rural landscape is characterized by vast tracts of poplars creating picturesque woods and a unique skyline. Therefore, the factory place is located in a district characterized by a high historical, artistic and environmental vocation.

A substantial efficiency program

The entire quantity of energy needed to sustain the plywood process, where large heated presses require a steady supply of vapour to assure the continuous cycle of compression required to produce plywood and chipboards for a wide range of end uses. The new plant will significantly improve the thermal efficiency of the Panguaneta factory: in fact they will be able to reduce to zero the use of natural gas, until now an important – and expensive! – ingredient of their process.

The plant’s start-up is foreseen by the end of 2014, after several months of assembly of the sub-components in BONO Sistemi factory in Peschiera Borromeo, near Milano, and the final ejection phase of all the parts in Sabbioneta.

A sophisticated BONO solution

The peculiar place where this unit operates – Sabbioneta, a World’s Heritage city – required particular attention towards the gas emissions levels of this large thermal plant. Local and central authorities imposed in this area maximum allowed levels of NOx and CO much more severe than those demanded by the current laws: this in view of a possible future application of stricter emission limits required to comply with the Kyoto Protocol targets.

BONO Sistemi designed a complete system, that includes the whole thermal line: the vertical storage tanks for chipped wood, the handling and feeding lines to bring the wood to the combustion chamber, where it is burnt on a large moving grate specially designed for this type of fuel. All fumes are filtered with a cyclone system and sleeve filters, conveying the ash to a central collection point.

An electronic emissions control unit monitors continuously the flue gas, alerting the supervisor in case of deviation from the tight imposed standards. The whole plant is controlled by a software programme developed by BONO Sistemi.

The Panguaneta plant’s start-up is foreseen by the end of 2014, after several months of assembly of the sub-components in BONO Sistemi factory in Peschiera Borromeo, near Milano, and the final ejection phase of all the parts in Sabbioneta.
Shale gas restores US petrochemical industry profitability

Shale gas in the USA provides a significant surplus of feedstock to the petrochemical industry, and important investments are currently underway to expand the Ethylene-based chemicals and polymers supply capacity. State-of-the-art environmental technology will enable ExxonMobil’s chemical expansion at Baytown to operate within existing Texas permitted emissions limits. ARTES Ingegeria will contribute with an innovative water treatment plant for the Ethylene cracker plant.

All the US-based Major chemical producers (including ExxonMobil, Chevron, Dow Chemical, Shell) are looking to take advantage of a surplus of natural gas that’s pushed gas prices near 10-year lows in the USA. With gas prices staying steadily below $3 per mmbtu (million of British thermal units), as a result of the mass production of shale gas, USA is running to become a net gas exporter and, in respect with their reserves, this situation is going to last on the next decades. Shale gas restores the profitability of the petrochemical industry in USA with prices competitive and sustainable feedstock.

ExxonMobil adds value to their natural gas

Exxon became the North America’s largest natural gas producer when it acquired XTO Energy Inc. in 2010. In addition to the profits generated from the sales of the product, Exxon has one key advantage: it can use its own gas for added-value chemicals and polymer products. A new ethylene cracker under construction in the ExxonMobil Baytownt Area, the largest petroleum and petrochemical complex in the USA. Covering five square miles, this is already the largest site in the nation and has been in operation since 1972. Its refinery can process up to 584,000 barrels of crude oil per day. The Baytownt ethane steam cracker will handle up to 1.5 million t/y Ethylene capacity, providing feedstock for two high performance polyethylene lines at its nearby Exxon Mobil plastics plant in Mount Belvieu, Texas, about 13 miles from the main site, rated with a capacity up to 650,000 t/y polyethylene. For the realisation of the Ethane Cracker ExxonMobil selected Linde Engineering, one of the world leading providers of Ethylene technology as well as a reputable Engineering & Contracting firm in the Gas Treatment & Petrochemical business.

Reducing environmental impact, a major target

“Reducing environmental impact has been an ongoing strategy at Baytown,” Steve Pryor, president of ExxonMobil Chemical Company, said in a speech at the 2013 HJS World Petrochemical Conference. “Over the past decade, the site has invested over $1.3 billion in environmental upgrades to improve air quality and achieve double-digit improvements in energy efficiency.”

Complying with this policy, the large Ethylene cracker will be equipped with a state-of-the-art water treatment. ARTES Ingegeria has been selected by Linde as the supplier of the whole demineralisation plant. Entiredly based on membrane technologies, the plant will be arranged on three trains, each including: Ultrafiltration (UF) section, first pass Reverse Osmosis, second pass Reverse Osmosis, Electrodeionisation.

The plant will have an overall capacity of 200 m³/h of treated water. A condensate polishing unit will complete the treatment on two Granular Activated Carbons filters able to treat 50 m³/h of water.

The job will be supplied within the first quarter of 2015. The supply will be delivered partially from the Italian plant of Oliveto Citra, near Salerno, and in part from a local US-based manufacturing source working upon ARTES plans and under their strict supervision during the engineering and installation phase. This confirms the capacity of ARTES to provide a complex set of equipment, built in accordance with local regulations and norms, to be installed very far away from their home turf.
Em-powering Cannon France

Thermoforming, Composites. As you can see in the www.cannon.fr page now the French unit is also dedicated to industrial boilers. Régis Durand is in charge of Sales.

Born in Lyon 42 years ago, married with three children, Régis Durand holds a Degree in Automation Technologies. He spent all his career in the field of Energy, working at the beginning in a French boiler’s company, continuing in an Energy service company and later for a manufacturer of burners.

An expert in all the aspects concerning the heat generation technology, Régis joined Cannon France in March 2014 to become Sales Manager for France, Belgium and the Maghreb area. His activity will be focused on the sale of the standard products – steam or water fire-tube boilers, and hot oil heaters – manufactured by the Industrial Division of BONO Energia.

Régis has taken over the current portfolio of French customers since the activity of BONO in France dates back to the 1970’s. Prestigious names appear in the reference list – among them EDF, Terex, ABB, Aventis Pasteur, Arkema... – and the task is now to extend it with the names of other clients.

First in the list of his priorities is to communicate on the quality, reliability and sturdiness of BONO Energia products to the French market such as the Energy Service companies, the Chemical and Pharmaceutical sector, and the Food industry.

For any need concerning industrial boilers in France you can rely on BONO Energia and on his French Sales Manager: Régis Durand, (rdurand@cannon.fr), Mobile +33 6 10 92 61 70, Fax: +33 1 60 19 22 94.

CFRP components for BMW Series i3 and i8 produced by Benteler SGL with Cannon equipment

Benteler SGL selected Cannon as equipment partner for the production of new, innovative Carbon-reinforced parts supplied to BMW. The main reasons for this choice include the availability at Cannon of a complete production package - chemical dosing units, high-tonnage presses, Carbon-fibre preformers and moulds - and the local presence of a competent sales and technical service staff.

Cannon Fibers - Reinforced Polymers (CFRP) for the automotive industry.

Among their numerous references stand the new BMW i8 and i3 Series models that utilize a total of more than ten components manufactured by the Ried-based company in their new production plant. Cannon Deutschland, in cooperation with Cannon ETEC, has supplied the turn-key installation required for this important contract.

The fully-automatic production line supplied by Cannon to Benteler SGL includes:

- one high-pressure dosing unit Cannon ESTRIM for the Epoxy resin application process, according to the Cannon LLD (Liquid Lay Down) distribution method;
- two 1,000 ton presses for the fast polymerisation of parts;
- five handling robots for the manipulation of Carbon fibres and finished parts;
- the whole set of electronic controls, safety devices and the storage facilities for chemicals.

The LLD distribution method used for this plant consists in depositing a liquid “ribbon” of formulated resin over the Carbon fibre reinforcement. The sandwich of various layers of Carbon fibres is therefore wetted with a uniform film of liquid that will perfectly impregate its entire surface once pressed in the mould. The absence of in-mould flow of reacting resin coming from the mixing head reduces drastically the counter-pressure generated during injection, allowing for the use of low-tonnage clamping pressures. This reflects into a limited investment in moulds and clamping tools and in a limited consumption of energy during each cycle, thus contributing to reduce production costs.

The high-pressure impingement mixing heads used for the ESTRIM technology allow for the use of fast-reacting formulations, able to generate parts which can be demoulded after only three minutes, a part-to-part cycle time very much appreciated by the automotive industry suppliers.

A peculiar aspect of the supply consists in the possibility of using recycled Carbon fibres, obtained from scraps generated by the preforming and trimming operations performed in the same plant or from other CFRP production units. A substantial saving in fibres cost can be achieved with the use of recycled reinforcement, as well as the solution of a major environmental and disposal problem.

The low overall weight of the new BMW i8 (1,490 kilograms) can be credited primarily to a passenger cell made from CFRP. Although it lends a component at least equal rigidity, this extremely lightweight high-tech material is 50 per cent lighter than steel and 30 per cent lighter than aluminium. The principle of intelligent lightweight design is applied to all the car’s components.

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