Energy & Water, Tomorrow

Cannon First
50 years

Energy Efficiency Improvement

ARTES Ingegneria Expands

Oil & Gas Projects in Russia

Energy from Biomass

Cannon for IKEA Refugee Shelters Project
It's EXPO time!

147 participating countries, over 50 pavilions completed, more than 8 million tickets sold and 20 million visitors expected. These are some of the figures of EXPO Milano 2015, which will open its doors on May 1. Being there will be both a fascinating experience and a tremendous opportunity for us. More than an exhibition, EXPO Milano will discuss the stimulating topic of FEEDING THE PLANET drawing attention to the universal challenges that we face and that will affect man in the future as well as most of the planet's industrial production.

It is not by chance that within the Italian pavilion – the most important pavilion of the exhibition – Palazzo Italia has been designed and managed by Confindustria, the Italian employers' federation.

This means that Italy stands for more than just good food and good taste; it is a technologically advanced country taking pride in its ability to create and offer “sustainable technologies to feed our planet”.

CANNON’s project meets this objective and justifies our cooperation with CONFINDUSTRIA to there participation in EXPO Milano. Nine guided tours to the Italian pavilion are in store for our Customers as well as a major communication event about a research project on future materials. These are the main initiatives that CANNON has scheduled for its Customers to help them experience EXPO 2015 from an industrial perspective.

We will bring our thermal insulating technologies to EXPO Milano – the very same technologies that have made CANNON a leading provider of solutions for household and industrial refrigerator production.

We will talk about our industrial boilers and our ability to make superheated water and steam for countless culinary applications: washing, peeling, cooking, dehydrating, freeze-drying, deodorising et cetera.

We will demonstrate the importance of new materials in designing an ever more efficient food distribution system on and across the planet.

There are many reasons for us to be through CONFINDUSTRIA at EXPO 2015 – not least the fortunate coincidence and unique opportunity to celebrate our 50 years of industrial history. This and much more.

See you at EXPO Milano!
Editorial

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See you at EXPO Milano!
Cannon Turns Fifty: a Tale to Tell

CANNON CELEBRATES THIS YEAR THEIR 50TH ANNIVERSARY.
WE INTERVIEW THE PRESIDENT, MARCO VOLPATO, FOR AN INSIGHT COMMENT ON THIS IMPORTANT MILESTONE.

Cannon News: Mr. Volpato, when a person gets to the mark of 50’s it’s time for some reflection and analysis. What does a Company do in such an occasion, by the voice of its President?
Marco Volpato: An optimist looks forward, at least to the next 50! A pessimist looks more backward, fearing not to be able to repeat the good things done in the past. A realist makes a good blend of some retrospective analysis, some current day’s situation, and a bit of outlook into the future, assuming he’s got a good crystal ball to look into! I think we all need to be realistic, trying not to be overwhelmed by fear or dreams. Our first 50 years have been “a tale to tell”, no doubt about it.

CN: What’s your retrospective analysis, then?
MV: We must put our origins in the historical context of the 1960’s. Italy’s economic boom, after cleaning up the rubbles left by WW2, was in its hottest period. Italian genius was expressing itself in a number of new activities.

Take Giovanni Borghi, an industrialist of white appliances located in Varese, Lombardy, for instance: he had just launched a new line of domestic refrigerators whose insulating media was rigid Polyurethane foam instead of classic rock wool. Great innovation, more space inside the fridge keeping the same outside dimensions, with better insulation properties and less electrical consumption. He used for his needs some Polyurethane dosing units made by a mechanical company that one of his partners had developed, thus he had a monopoly of that technology…

Cannon started making similar equipment but with better performances, adding a touch of finesse to the mixing phase, and sold it to some other refrigerator makers that were cut off from the new development for lack of hardware. It worked. We took off quickly.

Similar story for another family of Polyure-thanes, the flexible ones. We started moulding doll bodies with a flexible elastomer: we did it partly to make some cash, much needed to develop the small start-up Company that Cannon was in those years, and partly to get our fingers wet with the new stuff, to learn the trade by doing it, not by watching from outside.

And this also worked, we gained a great deal of experience in the “mixing mysteries” that are behind the success or the failure of a different formulation. We designed and made tens of different mixers for our low pressure units, in those years, just because we were learning first-hand how to deal with different formulations made available by the major chemical companies. Learning by doing, they call it in management schools now.

CN: Any major mistake, in the pioneering age?
MV: We learned, after a lot of development efforts, that the rising field of the shoe soles was a matter for shoe specialists, which we weren’t. We gave up after having supplied 20 or 30 Rota carousels and the relevant dedicated dosing machines. Results were technically good but we were not able to make them profitably, in simple terms. Same story for flexible continuous slabstock: another speciality that we were lacking, at that moment. You must be able to stop wasting time and money when you
realise to be in the wrong path and re-focus your efforts towards other targets. As well as you must be looking for your customers where they are, not where it’s more comfortable for you.

**CN:** Do you mean by driving your activity with a marketing-oriented structure?

**MV:** I mean physically going where they are, talking their language, both idiomatically and technically. We started very soon, 4-5 years after the beginning of our production, looking for international specialists able to distribute our equipment abroad. We started with the mostly industrialised countries, from Northern Countries, UK, Benelux, France, but also Spain and Greece, with our final aim being Germany. A strong presence in the lion’s den – full of competitors with strong patents and of customers with high expectations – would have been strategic for us to be recognised as a reliable partner.

**CN:** How did you approach this market?

**MV:** Through an Agency, that became later, in the early 1980’s, one of our strongest Locations. We were – as we still are – independent from major chemical groups, therefore we were free to talk to them all. We cooperated with their R&D labs first with low pressure equipment – since a Bayer’s Patent was blocking the high-pressure technology solutions – and then, when that patent expired, we immediately launched an innovative head for RIM (Reaction Injection Moulding) that was able to handle also abrasive fillers like glass fibres, much demanded at that time by the automotive industry for making bumpers and other car body parts. High pressure really boosted our development, and we soon reached a leadership position in the industry. **Our FPL head,** providing good mixing with very laminar flow of the reacting blend, opened the path to new applications, especially those requiring an open-mould pouring, like car and furniture seats. We immediately backed the high-pressure dosing units and mixing heads with all the demanded “dry side” hardware: mould carriers, large presses, complete foaming plants – developed, in the beginning, with partners specialised in mechanical plants, handling of large metal sheets, assembly techniques.

**CN:** A major switch, going from dosing units to complete plants: the construction mentality is different. How did you make it?

**MV:** Again, once more, learning by doing. Talking of domestic refrigerators, by working with them and with other specialists we got experience in our customer’s final product, we learned their methods and tricks, and we provided them proper technical solutions to apply them industrially. These were the years when Polyurethanes came out of their artisanal scale of production to become an industrially usable material. This brought volume and profit, and allowed us to think forward optimistically. And these were also the years of our great legal disputes with competitors around our patents on mixing heads: between 1979 and 1986 we fought 23 international court cases, winning most of them and settling others with cross-licence agreements. We spent a fortune in lawyers but we gained an incredible experience in intellectual property protection, one of our key factors of the future success.

**CN:** What did you do, when you realised that Cannon was already leading its market?

**MV:** We started being concerned, of course! When you are the leader you can only worry about those who are chasing you and about your market going down the drain. We said – it was the late 1980’s – that it was time to look for alternative technologies, because some environmental concerns already rising about Polyurethanes and their chemicals’ effects on atmosphere could have represented a threat for that whole segment of the plastics industry! We devoted all profits made in the 1980’s into a diversification strategy, acquiring in 1988 and 1989 some plastics equipment Companies well established in the Composites area (T.C.S.), in Thermoforming (Shelley) and in slabstock Polyurethane foams (Viking). And we looked outside the garden too, buying Ing. Bono S.p.A., a prestigious Italian brand in the field of Energy production and Water Treatment process. A bold move, we’ve been told by many in these years, that took us a couple of decades to turn into a profitable activity: our steam generators, biomass boilers and water treatment plants are appreciated worldwide for their efficiency and skilled design.

**CN:** Did this diversification take your focus out of the plastics industry?

**MV:** On the contrary, it stimulated us to look for possible synergy between the new and the former Companies of our Group. We strengthened our international network in those years: we had already opened locations in USA, Singapore, Japan, Russia. Our presence in China came naturally, already in 1982, through our Singapore arm. Later we opened our own offices in Mexico, Turkey, Brazil, Spain. We reinforced our Agents, local independent companies specialising in various areas of the plastics business.
By the way, the feared threat to the environment turned into a great opportunity, thanks to the Montreal Protocol of the late 1980’s, a massif research effort allowed for the replacement of Ozone depleting substances: for the Polyurethanes industry this meant new Chlorine-free blowing agents to be metered and mixed with different equipment.

A major impulse to the modernisation of plants worldwide: the solutions that we developed also granted to Cannon in 1999 “The Stratospheric Ozone protection Award” by E.P.A., the US Environmental Protection Agency, and then in 2002 Carlo Fiorentini, now our Honorary President, was inducted into the “Polyurethanes Hall of Fame” by A.P.I., the US-based Alliance for Polyurethanes Industry.

CN: What did you learn from the implementation in the implementation of the Montreal Protocol?
MV: A lot, dealing daily with international authorities opens you up to a wholly new world of ideas and opportunities! Not only the Plastics Divisions of Cannon gained experience from the Montreal Protocol, but the same happened for them and for the Energy & Water Treatment Division from the Kyoto Protocol, aimed to reduce gas emissions that generate the greenhouse effect. Our vision of 1988 was right: the Energy and Water Treatment industry is a place to be in, with innovative solutions and a proper distribution network worldwide.

CN: Enough with the past: where do you stand now?
MV: We are in the middle of another industrial revolution, and we must be able to understand – quickly – the new rules of the game.

The industry has generally gone eastward, for various reasons. But we should not forget the industrial potential – and the creative contribution – given by the Old World’s countries and the Americas. There is a design and manufacturing know-how that cannot be underestimated, ready to deliver high-quality products efficiently, with the proper tools.

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We focus on these. We are working today on more than 50... let’s call them “projects” – “technology sectors” – “competences” – as you like. One skill different from the other, working with different methods and approaches, with the need to let them co-exist with our culture and place them in a leading position, or at least in the second-one with the ambition to become the leader. Our biggest effort, in terms of organisation, is now aimed to shape the local offices – our Local Cannon Units – for a multi-technology approach.

They must learn to handle the whole portfolio of Cannon technologies as well as they were able, until now, to handle successfully the Polyurethanes and Plastics solutions.

CN: A vision for the next 50 years of Cannon?
MV: Our crystal ball is still under development, but I can state a few solid facts:

- Ours is a family business with an international flavour and ethical rules.
- The second generation of shareholders is fully committed since years in this challenge, and they are quite ready now to take over the burden until now carried by their fathers.
- We are independent from larger financial corporations. We’ve got to appreciate the advantages deriving from this freedom, even noticing the great contribution that private Companies of our size and structure are giving to the world’s Gross Domestic Product.
- We are innovative by nature, and will keep this profile because without innovation we wouldn’t be here talking of our 50th anniversary.
- We are international: this has been our best strategic move since ever and we won’t give up our commitment to a strong local presence.
- We claim that our integrity allows us to freely carry out our mission in the straightest possible way, without being distracted by other activities that are not bringing added value to the work we perform everyday.
- We live now through the third phase of internationalisation, we’re switching from a multi-national to a global structure. We will increasingly involve specialists from outside Italy in our R&D projects and in production management. We remain an Italy-born Group that integrates an international culture and human resources.
- We do not need further diversification: our strategy – resumed in Energy Efficiency, Energy Saving and Clean Manufacturing – is more than sufficient to guarantee us the means for a sound development using the available tools and skills.

CN: A clear list of statements and of ideas. Thanks for your time and for the interview, Mr Volpato!
MV: I could not miss this opportunity, since I invented the Cannon News forty years ago. I’d love to see it printed for another half century!

The Cannon Group today:
- 12 Manufacturing Centres
- 17 Local Cannon Units
- Agencies
- > 1,000 Employees
- > 200,000 sqm
- Factories & Offices
- > 200 M € Turnover

Cannon in the World, today
Want to improve the Energy Efficiency of your process? BONO Energia has the answer!

TODAY, TALKING ABOUT ENERGY EFFICIENCY IS ALL THE THING AND A LOT IS BEING READ ABOUT IT... BONO ENERGIA HAS BEEN DEALING WITH THIS MATTER FOR OVER FIFTY YEARS, DEFINING AND APPLYING NUMEROUS SOLUTIONS TO IMPROVE ENERGY EFFICIENCY – AND NOT ONLY OF A COMBUSTION SYSTEM. THIS ARTICLE DEFINES THREE AREAS WHERE IT HAS BEEN POSSIBLE TO IMPROVE THE OVERALL EFFICIENCY OF A CLIENT'S PROCESS, MAKING USE OF A CLEVER COMBINATION OF EXISTENT AND NEW TECHNOLOGIES.

The efforts to obtain higher efficiency from a system – whatever system – never end. Saving energy is not a modern concern, mankind always tried to get more from less, after all. Today’s worries – the decreasing availability of non-renewable sources of energy and the increasing environmental effects of their use – simply compound this efforts and highlight the need to optimise the way we consume our resources.

Getting two birds with a stone
BONO has been spelling this mantra since its foundation, in 1958, and has provided efficient methods to optimise the use of a wide range of combustibles and to reduce the consumption of water. Today, the availability of new technologies allows to extend its portfolio with efficient methods for increasing the overall yeald of a customer’s process. Conventional heat recovery methods as well as new systems for the use of streams of “complex” fuels (Hydrogen, offgas, lean gas, biogas, byproducts of cracking and of polymerization processes, etc.) allow to reach a double objective: the replacement of more valuable fuels with substances that were once destined to the flare torch, and the consequent elimination of another emission of a polluting (or a very hot) gas in the atmosphere.

Heat from turbogas compressors
A classic solution, very appealing for Oil & Gas applications, is represented by the use of a recovery system of the heat contained in the flue gases released by turbogas compressors. Widely employed to generate either electricity or compression by burning natural gas, these turbines release flue gases at more than 500 °C; they can be very useful if, nearby, another plant performs the gas treatment or specific heat demanding processes.

BONO Energia experience for heat recovery downstream gas turbines up to 20MW covers the possible supply of different heat recovery systems like steam generators, hot water boilers, thermal fluid heaters etc. This very specific application found an ideal solution using BONO Energia thermal fluid heaters, designed to handle hot fluids with a compact equipment. The severe API norms that generally rule the engineering specifications of oil-related plant require a specific know-how for the design and construction of a proper heat recovery system. BONO Energia features more than 40 years experience in designing critical high temperature hot oil heaters. The most recent example of such an application is represented by the supply of a thermal fluid heater to a major refining site in Tunisia, North Africa, to be installed during 2015.
Heat from the heavy fractions of oil cracking

A very common problem for any oil refinery is the disposal of the heaviest fractions of the distillation. The bottom of the cracking tower generates a significant quantity of dense, asphalt-like liquid. Its composition is quite variable and complex, depending both from the type of crude oil and from the operating parameters of the distillation. Getting rid of this sticky – although valuable – fraction is increasingly difficult, especially if there are no valid (i.e. economical) alternatives for its reuse "as is".

Its combustion can be done in special furnaces, from which hot flue gases (around 800-850°C) are generated.

BONO Energia designed and makes special water-tube recovery boilers that can handle these hot, dirt flue gases to generate superheated steam at 240°C and 20 Bar. The main difficulty for this process derives from the composition of these flue gases, that are very rich in corrosive chemicals, mostly deriving from Sulphur-rich crude oil, and in volatile solid particles. The heat exchange surfaces are designed for an easy, automated cleaning operation, performed by soot blowers that are periodically introduced between the tubes to remove all the sooting.

The manufacturing and operational experience gained by BONO Energia with the supply of biomass-fed boilers – whose combustibles are characterised by similar problems – proved extremely valuable in the design of these special recovery boilers: their main advantages can be summarised in high thermal efficiency, long lasting operational life, elevated automation and reduced maintenance.

The most recent of these recovery steam generators, able to supply 15 tons/h of overheated steam, has been supplied in 2014 to a Central African large oil refinery.

Heat from Hydrogen

Many streams of industrially-obtained gases have been sent to a flare torch for decades, due to the difficulty of finding a convenient end use near their production site. The flare is still a common disposal system today for technical grade Hydrogen, Butadiene, off gas, lean gas, biogas etc. but this method is getting more and more impractical and difficult to apply today, with a growing environmental conscience and the need to squeeze industrial costs from any possible corner.

BONO Energia developed a number of dedicated solutions for the reuse of these industrial streams, where one of the main concerns derives from the possible wide variability in their chemical composition. The whole thermal system must be designed to accommodate a wide range of quantitative and qualitative variables, in order to be able to work with almost any kind of emitted gases.

Safety is of paramount importance in these applications, as well as the capacity to operate with a split-range mode, modulating the feed of different types of gas. One of the most recent plants of this type went in operation in 2014 in Northern Italy, where a supplier of chlorinated aromatic products and specialty dichlor-toluenes, mainly used in the agricultural and pharmaceutical markets, required a proper solution to handle a stream of technical grade Hydrogen, a byproduct of their production not suitable for the market.

The peculiar characteristics of this gas, very easy to ignite and prone to explosions, required a specific burner and a carefully designed combustion chamber.

The result of the relevant project is a special water-tube CTD boiler that is currently producing 20 tons/hour (14 MW) of steam at 18 barg for the client’s process.

A heat recovery system assures a plant thermal efficiency of 97%.

Panguaneta:
the biomass plant is almost ready!

THE INSTALLATION OF THE BIG BIOMASSES PLANT OF PANGUANETA, ITALIAN LEADING COMPANY FOR THE PRODUCTION OF PLYWOOD, PROCEEDS APACE.

Within the first half of 2015 the Panguaneta factory in Sabbioneta, near Mantua, will start commissioning a huge plant, fuelled with the waste of the making of panels, so to produce the required steam for the production cycle.

Barks, branches, wood discarded during the makings and panels to be recovered will be "chipped" to tiny dimensions and burnt in the thermal plant built by BONO Sistemi.

This solution will eliminate the consumption of natural gas, in compliance with the regulations set forth about polluting emissions: Sabbioneta, listed by UNESCO as World Heritage since 2008, has an historical, artistic and naturalistic value that does not permit any infraction at all of laws on environmental protection!
BONO Sistemi cuts energy costs in the paper industry

The final phases of the assembly of the biomass boiler installed at the French branch of a big tissue manufacturer.

BONO Sistemi, with over 50 years of experience and with more than 60 installations worldwide, is a leading company in the engineering and production of steam generators and thermal fluid generators fuelled with biomass.

The technological solutions by BONO Sistemi are especially applied in the food farming or in the wood and paper industries, where the waste of production processes such as pomace, rice husk, skins of various seeds, trimmings and wood chips, waste of panels, barks and sawdust, often represent a management problem and a disposal cost.

BONO Sistemi makes its experience available for firms, as well as its competence and technology to value the waste di production, transforming them in a precious free-of-charge energy source. In particular, BONO Sistemi can devise and deliver complete turnkey solutions for thermal and co-generation plants starting from the “green field”.

Solutions dedicated to paper mills

An important Italian manufacturer of paper and related products, working at global level, has recently entrusted the implementation and building of a 13 MW thermal plant fuelled with wood chips to BONO Sistemi, destined to its manufacturing plant in France. The biomass thermal plant will replace the existing gas plant: this is a choice of commitment by this paper company to favour the renewable energy against the fossil fuels, for the production of thermal energy.

The paper industry, notoriously very energy demanding, continuously needs medium pressure steam, about 18 barg, to feed the machineries producing the “tissue”, with an almost constant thermal performance, 24 hours a day, about 340 days a year. Therefore, the plant has been designed to meet these requirements of high reliability and operation capacity.

The supply by BONO Sistemi includes:
• the steam boiler that can operate without the constant presence of supervisors up to 72 hours,
• the complete fumes treatment up to the flute,
• the ash removal and transportation system,
• the biomass fuelling system consisting of a 1000 m³ silo with forklifts, 72 hours of autonomy and chain conveyor,
• sewage treatment and degassing system,
• water removal,
• control panels equipped with all electric connections and water and steam pipes up to end users.

A few simple steps toward substantial savings

The decision to invest in a brand new thermal plant can be sometimes very hard one, especially if the existing equipment is still functioning, although not optimally: BONO provides a specialised service to increase the energy efficiency of existing thermal plants, offering a preliminary study of the existing situation (an energy audit), the detailed list of suggested improvements, the execution of all necessary works and the guarantee of a final result. Few simple precautions can bring a substantial saving in operating costs:

• Install an heat recovery system on the exhausts fumes stream: this can reduce the fuel consumption up to 3-4 %;
• Install an inverter on the electric motors of the recirculation/feed pumps and on all fans: the electricity savings can reach 30-40 % and the life of pumps will be increased significantly, due to their lesser stress;
• Control the combustion by installing a dedicated electronic control – OptiSpark or GARC – to further reduce fuel usage by 1-2%, guaranteeing a stricter control of the NOx emissions;
• Install Low NOx burners, to drastically reduce the emissions of Nitrogen Oxides, perceived among the most polluting gases for the environment.

When using a new or revamped BONO thermal plant a paper mill obtains a guaranteed higher thermal efficiency, higher automation, reduced environmental impact and the possibility – where laws permit – to gain Energy Certificates: four winning aces to save money while improving the environmental impact of the factory.
For more than 50 years: BONO thermal oil ovens for any application

Since 1962 BONO Energia has been a reliable partner for the supply of thermal oil heaters for the direct heating of process fluids, highly valued by more than 4,000 customers all over the world and from different sectors: Oil & Gas (for bitumen, refining processes, pre-heating of crude and pipeline oil), Chemical (for synthetic resins and the preparation of polyester, synthetic products, drying processes), Textile (for synthetic fibres, dyeing, printing, heating of the folding machines), Iron and Steel Industry (for anodising, phosphatising, hot rolling), Rubber and Plastic Materials (for the heating of printing machines, production of polypropylene and PVC), Flexible Packaging (heating of printing machines, lamination and coating), Paper (for production and printing), and soon.

The thermal oil ovens (series OMP and OMV) and the flash coil steam generators (series UM) are mass-produced in the BONO plant in Netro, near Biella, in Northern Italy.

BONO Energia has recently implemented and is providing international engineering companies with solutions inside containers for the use of thermal oil heaters in all particularly harsh places from an environmental, climatic or simply logistic point of view: for example, in any situation where it would be more logic carrying the whole thermal plant, outfitted with engines, pumps and electric aids, instead of having to build it on site!

A 40-feet (12-meter) long container, properly modified in order to allow the recirculation of combustion air, can contain two OMV 600 heaters that can generate a thermal power equal to 700 KW. The other version, the 20-feet (6-meter) long one, can contain one OMV heater.

For further information please visit www.bono.it!
Siberia: crude oil flows thanks to BONO Energia!

A 488-kilometre long oil pipeline will transfer every year, as of 2016, 45 million tons of crude oil from Purpe area to the coast terminal on the Kara sea. It will cross a very delicate environment made of tundra, taiga, forests, summer swamplands and winter frozen lands. Seven heating stations will allow to maintain the fluid at a temperature of 60 °C, to allow its correct pumping in an often-polar climate.

ONE OF THE MOST IMPORTANT AGREEMENTS UNDERSIGNED BY BONO ENERGIA IN 2013 WAS ABOUT THE SUPPLY OF 76 THERMAL OIL BOILERS FOR A REALLY PECULIAR APPLICATION IN THE OIL&GAS SECTOR.

THE 488-KILOMETRE LONG OIL PIPELINE CONNECTING ZAPOLYARIE AND PURPE, TWO RUSSIAN LOCATIONS ON THE ARCTIC CIRCLE, WILL TRANSFER 45 MILLION TONS OF CRUDE OIL FROM THE EXTRACTION AREAS TO THE TERMINAL ON THE KARA SEA.

THE HIGH VISCOSITY OF CRUDE OIL AND THE CHILLING TEMPERATURES OF THE AREA REQUIRE AN ACCURATE HEATING OF THE LIQUID TO ALLOW ITS PUMPING.

BONO ENERGIA PROVIDES TWO RUSSIAN ENGINEERING COMPANIES – REMEKS AND OZNA – WITH THE THERMAL OIL OVEN NEEDED TO PRODUCE THE REQUIRED HEAT FOR THEIR OPERATION.

In order to extract and transport crude oil from extraction fields to refineries and employment areas billions of... any currency are spent every year! Nobody backs up from any hurdle, be it a marine depth, a sweltering desert or one of the world harshest natural environments: Siberian Tundra near the Arctic Circle.

Right in this area, an oil pipeline whose length goes beyond 900 km that will connect the wells in the Russian region of Yamalo-Nenets to a marine terminal on the Kara sea is being built.

It will have to overcome 90 watercourses, including big rivers such as Pur and Taz, as well as 21 main streets and 250 kilometres of tundra, taiga, forests and summer swamplands and winter frozen lands. Actually, not a cakewalk.

The segment between Purpe and Samotlor, 429 km, has been opened in 2011 and it already transports 25 million tons of crude oil per year.

The second segment, from Purpe to the sea, once completed in 2016, will move over 45 million tons.

The high viscosity of crude oil and the polar temperatures recorded in this region for most of the time entail the heating of crude oil at a temperature of 60 °C so to keep it fluid all the way long.

The whole oil pipeline has been designed above-ground paying particular attention to avoiding possible heat losses – from the insulated pipes, having 600 mm internal diameter – that could provoke damages to the permafrost, to the vegetation and to lichens present in this area.

Special solutions to special problems

Each of the eight great heating and pumping stations, designed for the line every 60 km, are equipped with special thermal oil ovens exchanging heat with crude oil in large heat exchangers: the thermal oil is fed at 180 °C.

The 76 ovens – special versions of the OMV model by BONO Energia, having a capacity equal to 4 thermal megawatts – have been delivered to two Russian engineering companies – 48 to Remeks and 28 to Ozna – who have built some special 12-meter long two-floor containers that are thermally insulated, in order to install them on site.

These ovens may be fuelled by heavy naphtha (today) and natural gas (that will be available there in a couple of years), so to allow a multiple choice on fuel. Designed and built in compliance with the strictest European regulations, these OMV hold a GOST Certification and a RTN (Rostehnadzor) permission.

Two OMV units similar to these have been previously supplied to Shell Russia for a comparable application, and this reference has played an important role in the obtaining of this important order for BONO Energia.
WATER MOVES ON, AT CANNON! WELL, NO FLOOD RISK, DON’T WORRY. ACTUALLY, IT IS THE ARTES INGEGNERIA DIVISION, RESPONSIBLE FOR THE WATER TREATMENT PLANTS, THAT IS GROWING. AND IT HAS BEEN DOING IT FOR SEVERAL YEARS, CONTINUALLY AND REGULARLY, BY INCREASING SALES, TECHNOLOGIES, PATENTS, SALES NETWORK AND – LAST YEAR – ALSO TRIPLED ITS ROOM DEDICATED TO THE MANUFACTURING ACTIVITY. PASQUALE PUNZO, MANAGING DIRECTOR, IS GOING TO EXPLAIN US ALL THESE NOVELTIES.

Cannon News: Mr Punzo, can you simply tell us how the company is doing?
Pasquale Punzo: In a nutshell, I would say very well! This is a very important year for ARTES Ingegneria. The issue of water treatment becomes more significant day by day, all over the world, and we devise innovative solutions fitting the growing needs for efficiency and environmental conservation. Plenty of sales, a lot of work, a great deal of new events happening... We are very busy, to cut a long story short.

CN: Can you show us all the novelties, possibly starting from some figure?
PP: The growth rate that has been characterizing our company’s activity for several years is going on. In 2014 we turned over 28 million Euros, compared to 24 in 2013, growing by 17%. And what is growing even more is the value of sales, 35 million as opposed to 23 in 2013, way beyond 50%. We have hit some important targets in the field of Oil&Gas, and now we have to project, manufacture and deliver! As a consequence, we expanded our manufacturing site.

CN: Where did you expand and how?
PP: We added a building next to our factory in Oliveto Citra (about half an hour away from Salerno) twice as large as the first one. We tripled the manufacturing room going from 4,000 to 13,000 square meters, with an evident refurbishing of the other building. We had to completely clear the whole roof and the whole internal structure of the asbestos. It had been a factory for metal structures, initially destined to the nuclear then energy industry. Now we have adjusted it to our needs, also building a separate department for the processing of stainless and coated steel.
We have equipped ourselves with special machineries, fitting our application needs for the production of cladded steel, in compliance with the extremely strict American laws set forth by ASME as to the resistance and corrosion.
Now, under the overhead travelling crane in our plant the height limit is 8 meters, so we can completely pre-assemble even the highest plants.
Our technical offices will have all the room needed for the realization of the new jobs, and for the new staff. In the year 2014 only, we have hired four new engineers – and two more are to arrive in the next few months – and a dozen of technicians expert in manufacturing.

CN: How many people work at ARTES today?
PP: At our Corporate Christmas Dinner there were 120 of us, coming from the three offices of Salerno, Oliveto Citra and Peschiera Borromeo. I like to remind that, at least five people work full time on quality.

ARTES Ingegneria expands!
The whole company works in compliance with ISO 14000, to abide by the standards of the environmental quality, as well as paying attention to the ethical aspects of our activity, in compliance with Italian Law 231/2001 obliging the companies “to put in place procedures aiming at preventing offences”. No tricks, at ARTES!

**CN** : How are the novelties concerning the technologies being used?

**PP** : The world keeps asking for clean water for drinking, washing and for industry. We are expert in industrial water treatment for both feed and discharge flows, in technologies for the Oil&Gas industry and in the purification of marine, brackish and ground water. Nowadays the most frequent demand comes from the Oil&Gas sector, both for the extraction and for the refining.

In addition to our water treatment lines for production, we are dedicating more and more to the waste-water in refineries both onshore and offshore. For example, the most important order ever obtained by ARTES Ingegneria has been sold last year to a refinery in Turkmenistan, for a plant equipped with treatment system. More than 14 million Euros to treat about 35,000 cubic meters of water a day through 6 different processes. For this plant the most innovative and effective technologies in the field of biological and chemical oxidation, of filtering and of membranes are adopted. The peculiarity of this plant is its treatment process: it is so innovative that 75% of the whole quantity of treated water is recovered and reused inside the refinery, and the remaining 25% is purified and discharged into the Caspian Sea where, in order to contain the pollution of this closed basin, the maximum limits for discharging are about 20% of the ones set forth for the Mediterranean Sea.

**CN** : What are the novelties concerning the technologies being used?

**PP** : Through a tight cooperation with Universities and Research Centres. During these years, we are cooperating with the Universities of Engineering in Naples, Salerno and Cosenza. Properly patented Superoxidation techniques to eliminate pollutants that are refractory to standard techniques, or systems for biological treatments based on membranes and activated carbon encapsulated in a micro-cellular pulsed air support are being elaborated. We have recently patented a technology for the treatment of the ships’ ballast water avoiding the transportation of polluting micro-flora from the different seas; working exclusively during the navigation, our system allows a significant saving for ship owners, eliminating the downtime caused by the bunkering services at quays. We are optimising permanent vacuum degassers that allow a 30% saving on power consumption compared to the traditional ones and do not need steam.

We have developed an innovative hydrocyclone for the separation of the oily phases from water, for oil well applications. We never hang back from the research activity!

**CN** : What are the most important sectors of application for your activity and the areas where you sell the most?

**PP** : Let’s say that today the Oil&Gas sector and the Petrochemical one yield at least 70% of our turnover. Then the Power sector - that is the energy production – is worth around 10%. Thereafter there is all the rest: food and textile sectors, rubber industry, paper mills, surface treatments. A growing sector is that of treatments for platforms for the disposal of liquid waste, in Italy too. We deliver complete packages with a totally automated process to purify the different kinds of sewage. The plant is generally composed of several separate sections that are automatically interlinked and interchanged according to the EWC code of the effluent to treat.

For what concerns geography, we can start by saying that Italy – representing almost 100% of our turnover in 2004 – today accounts for less than 10%. It was not us who lost market shares: sadly enough, it is the market that is disappearing. That is why we turn to foreign countries: we sell 15% to Europe, 35% to the Arab states of the Persian Gulf, 25% to the Far East and the Pacific countries, 15% to the Americas.

We foresee a strong increase in all countries of the former USSR with the “-stan” suffix in their names and, for many years to come, in the states of the Persian Gulf. Just in the current weeks, we are evaluating some access ways to North America, mostly for the shale gas development on which most of our investments will be made, in that area. The availability of an outstanding technical-commercial network such as the one of the Cannon Group - located today in more than 50 countries with direct branches and Agencies – allows us to look at export in a more serene manner. Even if used to sell other products, such as plants for Polyurethane and plastic, these facilities allow us to integrate a local expert in the water treatment services and have him directly communicate with us at our headquarter.

He finds himself in the territory, we support him from the distance or on site, should our presence be really necessary. He will professionally grow, get to know our technologies and after some time become self-reliant. This pattern has already been tested: it works. Now we have to apply it in other locations of Cannon. Some more work to do in the year 2015!

**CN** : Thank you and all the best for this new year too!
THE UK’S PETROGAS IS ABOUT TO CARRY OUT A LARGE-SCALE MODERNIZATION PROJECT AT THE TURKMENBASHI COMPLEX OF OIL REFINERIES (TCOR) IN TURKMENISTAN. PETROGAS HAS PARTNERED WITH ARTES INGEGNERIA FOR THE IMPLEMENTATION OF A LARGE-SCALE TECHNOLOGICALLY-TREND-SETTING EFFLUENT TREATMENT PLANT.

Turkmenistan, a country very few people can easily locate on a map, is now on the cover pages of business magazines. The Central Asian country sits on some of the world’s largest natural gas and oil reserves. Turkmenistan, with proven natural gas reserves of approximately 265 trillion cubic feet (Tcf), is the sixth largest natural gas reserve holder in the world and was among the top 15 dry natural gas producers in 2012. However, a lack of adequate infrastructure, along with geographical distance from buyers and other factors, have hampered the country’s efforts to export hydrocarbons in the past.

The country now aims to triple its crude-processing capacity by 2030. Turkmen government officials have said the country hopes to boost its oil-processing capacity to 300,000 bpd (barrels per day) in 2015, rising later to 400,000 bpd in 2020, 440,000 bpd in 2025 and 600,000 bpd in 2030. This will be accomplished by easing capacity at its existing oil refineries and building three new refineries by 2030.

The Turkmenbashy refinery, located on the Krasnovodsk Gulf of the Caspian Sea, is one of Turkmenistan’s two oil-processing facilities. Capable of handling around 120,000 bpd, it accounts for more than half of the country’s total throughput capacity of 200,000-220,000 bpd.

Turkmen authorities launched the latest round of modernization work at the Turkmenbashi refinery in May 2012. In November 2012, Turkmenistan announced that South Korea’s Hyundai Engineering had been chosen to implement a US$534 million modernisation project at the refinery.

In late 2013 London-listed PetroGas LLP has been selected by Turkmenbashi Complex of Oil Refineries as the EPC contractor for a vast rehabilitation program including the reconstruction of water supply, petrochemical plants and the construction of a modern waste water treatment plant.

For the latter PetroGas decided to partner with water treatment specialist ARTES Ingegneria, a well-known name in the Oil & Gas sector. PetroGas, who are already very much accustomed to the ambient conditions in Turkmenistan, will take care of the land clearing, execution of civil works, mechanical installation, electrical and instrumental wiring and cabling, automation of the entire system as well as the site services including commissioning and start-up.

ARTES will focus on the technological part while providing the overall process design and the detailed engineering of the skid-mounted units: Pre-fabrication of the critical equipment will be done in ARTES’ own factory in Salerno, Italy.

The effluent treatment plant has an overall capacity in excess of 1,000 m³/h, among the largest industrial waste water treatment (WWT) in the world. It is arranged on four WWT trains, a mobile sludge dehydration unit and a sanitary water treatment system.

But capacity is not the sole challenge. In order to meet extremely stringent limitations on the concentration of various chemicals species in the treated water outlet, each train has been designed to incorporate an oil separation section, a biological oxidation and a tertiary treatment. Oil separation is featuring Coalescing Plates Interceptors (CPI) and dissolved air flotation.
The tertiary treatment, which is in most cases useless downstream an MBR unit since all solids and bacteria are removed there, is targeted to the selective removal of those organic molecules that are difficult to be biologically oxidized. An advanced oxidation process with Hydrogen Peroxide injection, a specifically developed catalyst and an adsorption unit is therefore implemented to get rid of residual aromatics and toxic compounds down to ppb (parts-per-billion) levels.

Founded in 1998, PetroGas is specialised in the construction and rehabilitation of infrastructures in the oil and gas sector. In particular PetroGas implements projects including EPIC (engineering, procurement, installation and commissioning), construction of pipelines, onshore and offshore, compressing and pumping stations, oil and gas treatment plants, tank farms and offshore oil and gas structures. PetroGas is headquartered in London, UK with facilities in Ukraine, UAE, Russia, Turkmenistan.
WATER TREATMENT SYSTEMS ARE ESSENTIAL IN ANY OPERATION CONCERNING THE EXTRACTION OF OIL AND GAS. HUGE QUANTITIES OF WATER MUST BE TREATED ON SITE, EITHER TO MAKE IT SUITABLE FOR INJECTION IN THE RESERVOIR TO MAKE OIL FLOW IN OR TO SEPARATE UNWANTED COMPONENTS FROM THE PRODUCED WATER TO ALLOW RE-INJECTION OR DISPOSAL.

ARTES INGEGNERIA DEVOTED IN THE PAST YEARS SIGNIFICANT R&D RESOURCES TO SET UP A COMPLETE PACKAGE OF TREATMENT TECHNOLOGIES SUITABLE FOR THESE APPLICATIONS, TO BE APPLIED BOTH ONSHORE AND OFFSHORE. ALESSIO LIATI, SALES & MARKETING MANAGER OF THE CANNON COMPANY DEDICATED TO WATER TECHNOLOGIES TELLS MORE IN THIS INTERVIEW.

Cannon News: How would you define your activities in O&G Upstream applications? 
Alessio Liati: To put it lightly, going upstream is never easy, you must make a lot of efforts to cover a little distance! Jokes apart, we are concentrated in the development of a complete package of solutions, suitable for both onshore and offshore extraction sites. As you can imagine, water is a critical issue when oil production is concerned. On the one hand treated water must be injected into the oil basin to keep oil flowing, on the other hand oil cannot be extracted if treatment of produced water is insufficient. In both situations, the quantities of water that we must treat daily are huge: we’re developing modularised solutions easy to deploy on site to be started up in a short time.

CN: Can you give us some examples of these treatment packages? 
AL: The most recent is under assembly for the largest Algerian oil producer. They are going to start onshore natural gas production in the Sahara desert, within the Reggane North Development Project, 1,500 km south-west of Algiers. That is a major gas project indeed! The fields are estimated to produce 8 million cubic metres per day of gas for the first twelve years. The lifespan of the fields is estimated to be twenty five years, during which approximately 50 billion cubic meters of gas are estimated to be produced. Construction works began following the award of the main contract in May 2014, and first production is expected in mid 2017. Up to 26 production wells will be drilled and surface facilities, including an airstrip and 160 km of roads, will be constructed to bring the field into production. The long-term plan envisions the development of up to 104 wells across the six fields.

The main contractor needed a complete treatment plant for the water which is associated to the extracted natural gas. Here the main problems are the deoiling process and the separation of solids contained in the gas. The process scheme is based on hydrocyclones as primary deoiling process, a degasser to remove the entrapped gas, a cartridge filter as a trap to remove solid particles and cartridge coalescer acting as a polishor on residual oil. Hydrocyclones in particular are a valuable method for the separation of sand, solids and oil from produced water because of the compact footprint, protection against erosion, no moving parts, minimal maintenance, high efficiency and consistent performance. Centrifugal force is the driver for the hydrocyclone process which is implemented on an array of cyclonic elements called “liners” installed into a pressure vessel.
On the one hand treated water must be injected in the development of a complete package of a little distance! Jokes apart, we are concentrated never easy, you must make a lot of efforts to cover activities in O&G Upstream applications?

INTERVIEW.

MARKETING MANAGER OF THE CANNON OFFSHORE. ALESSIO LIATI, SALES & BE APPLIED BOTH ONSHORE AND SUITABLE FOR THESE APPLICATIONS, TO PACKAGE OF TREATMENT TECHNOLOGIES.

PAST YEARS SIGNIFICANT R&D ARTES IN INGEGNERIA DEVOTED IN THE SEPARATE UNWANTED COMPONENTS MUST BE TREATED ON SITE, EITHER TO AND GAS. HUGE QUANTITIES OF WATER WATER TREATMENT SYSTEMS ARE TO BRING THE FIELD INTO PRODUCTION. THE LONG-TERM PLAN ENVISIONS THE ESTIMATED TO BE PRODUCED. CONSTRUCTION WORKS BEGAN FOLLOWING THE YEARS, DURING WHICH APPROXIMATELY 50 BILLION CUBIC METERS OF GAS ARE STARTED UP IN A SHORT TIME.

WE'RE DEVELOPING MODULARISED SOLUTIONS EASY TO DEPLOY ON SITE TO BE SITUATIONS, THE QUANTITIES OF WATER THAT WE MUST TREAT DAILY ARE HUGE:

PARTICULAR CHALLENGES FOR THIS PROJECT HAS BEEN THE DESIGN PRESSURE OF 70 BAR COUPLED WITH THE DUPLEX STEEL EXECUTION TO COPE WITH THE HIGH CORROSIVENESS OF THE PRODUCED WATER.

CN: ANY RECENT EXPERIENCE OFFSHORE?

AL: TAKE FOR INSTANCE THE LATEST COMPLETE WATER INJECTION PLANT SUPPLIED TO THE LARGEST POLISH OIL COMPANY FOR ONE OF THEIR OFFSHORE EXTRACTION SITES IN THE BALTIC SEA. IT'S A MODULAR SOLUTION BUILT WITHIN A 4-STORY 25-METER-HIGH TOWER STRUCTURE, WITH A VERY COMPACT FOOTPRINT. THE CUSTOMER NEEDED THE COMPLETE TREATMENT CYCLE FOR INJECTION WATER, THE ONE WHICH IS PUMPED UNDER HIGH PRESSURE IN THE UNDERWATER OIL RESERVOIR TO FULLY EXPLOIT ITS PRECIOUS CONTENT. THIS SEA WATER UNDERGOES A DOUBLE FILTRATION, FOR THE SEPARATION OF COARSE AND FINE SOLIDS, THEN IT IS Degasessed under vacuum with our proprietary ZeroGas® technology to eliminate the Oxygen: this gas can cause corrosion of metal equipment and, even worse, it would nurture the growth of Sulphate Reducing Bacteria (SRB) within the oil, generating a corrosive and acidic media which would spoil its quality. WATER IS ALSO CHEMICALLY TREATED WITH ANITSCALING AGENTS, OXYGEN SCAVENGERS AND CORROSION INHIBITORS, TO AVOID UNDESIRED REACTIONS WHEN DIFFERENT TYPES OF WATER MIX IN THE DEEP RESERVE.

ARTES INGEGNERIA SUPPLIED TO THE CONTRACTOR THE COMPLETE EQUIPMENT FOR THESE THREE PROCESSES, PLUS THE ENGINEERING DETAILS FOR THE MODULARISATION, THAT HAS BEEN CARRIED IN A POLISH YARD ON THE BALTIC SHORES. ONE ONLY SUPPLIER RESPONSIBLE FOR THE WHOLE TREATMENT PLANT IS ONE LESS HEADACHE FOR THE CUSTOMER AND FOR THE CONTRACTOR!

CN: WE REPORTED LAST YEAR THE NEWS REGARDING A LARGE ORDER FOR AN OFFSHORE OIL PLATFORM IN ABU DHABI: CAN YOU UPDATE US ON THIS CONTRACT?

AL: CONSTRUCTION IS FINISHED AND WE ARE DELIVERING IT TO A LARGE FABRICATION YARD IN ABU DHABI WHERE MODULARISATION OF THE ENTIRE PLANT WILL TAKE PLACE. IT IS A COMPLETE PRODUCED WATER TREATMENT PLANT WHERE 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 CORRESPONDS TO 50,000 BARRELS A DAY.

FOR THIS PLANT WE USE THE HIGHEST QUALITY METALS AND COMPONENTS: THE WHOLE PIPING AND THE INTERNAL CLADDING OF THE VESSELS ARE MADE IN INCONEL 625, AN ALLOY CONTAINING 59% OF NICKEL, PLUS CHROMIUM, MOLYBDENUM, NIOBIUM, TANTALUM AND OTHER METAALS THAT MAKE IT EXTREMELY RESISTANT TO OXIDATION AND CORROSION. IN FACT THESE PRODUCED WATER 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 MADE US PACK A HIGH NUMBER OF TREATMENT COMPONENTS IN THE MINIMUM SPACE.

OFFSHORE PROJECTS IN ASIA PACIFIC

Technip MMHE, the EPC contractor resulting from a joint venture between Technip Geoproduction and Malaysian Marine Heavy Engineering, has chosen Artes Ingegneria for two important projects in Malaysia. Artes is delivering two different water treatment plants, each of which will be installed on the offshore rigs of Petronas and Shell. Petronas will install a sea water desalination plant and a drinking water unit for a large platform, including media filtration, chemical conditioning, reverse osmosis and remineralisation. The solution will provide 50 m³/day of fresh water for both human and industrial use on-board the platform. Shell will install in one of their oil rigs in Maliku field a sea water treatment plant for the production of demineralised water for process use. This supply includes the use of membrane-based reverse osmosis and electrodeionisation. The capacity of this unit is of 200 m³/day.
Russia’s mammoth LNG plant asks for ARTES’ water skills

YAMAL LNG IS THE NAME OF A LIQUEFIED NATURAL GAS [LNG] PLANT IN THE YAMAL PENINSULA, LOCATED IN NORTHWEST SIBERIA, RUSSIA. THE PLANNED PLANT WILL HAVE THREE PRODUCTION TRAINS, WITH TOTAL CAPACITY OF 16.5 MILLION TONNES OF LNG PER YEAR, THAT ARE AMONG THE WORLD’S LARGEST. FIRST TRAIN WILL BE OPERATIONAL BY THE END OF 2017 AND THE FULL CAPACITY WILL BE ACHIEVED BY 2021. THE PROJECT, TO BE EXECUTED IN ONE OF THE WORLD’S COLDEST REGIONS, IS EXPECTED TO COST US$27 BILLION.

ARTES INGEGNERIA WAS AWARDED WITH A CONTRACT FOR THE SUPPLY OF A COMPLETE WATER DEMINERALISATION PLANT WITH A CAPACITY OF 330 m³/DAY. AND THIS IS NOT THE ONLY PROJECT IN RUSSIA AND CSI: SEVERAL ARE IN THE PORTFOLIO OF ARTES INGEGNERIA.

Yamal peninsula holds Russia’s (and the world’s) biggest natural gas reserves: an estimate of 55 trillion cubic meters makes this Russia’s largest energy project in history.

Gas deposits in this sub-Arctic region were first identified during Soviet times, but it is only now that the Russian state has had the resources and technical expertise to develop the fields in one of the most inhospitable places on Earth. Environmentalists already denounced the potential risks of an uncontrolled development of this area, housing the largest part of reindeer herders in the northern hemisphere.

The protection of the vast permafrost area, rich with unique vegetal and animal species, has concerned both local and central authorities as well as the involved private parties that have won the exploitation rights on these immense LNG resources. The Kara Sea, surrounding the Yamal peninsula, offers a naval alternative for the transportation of incoming equipment and – in future – for exporting the LNG to the energy hungry areas of China and Asia Pacific.

Technip France, the EPC contractor that – with international partners such as Chiyoda and JGC – build the LNG plant, awarded ARTES Ingegneria with a contract for the supply of a water demineralisation plant capable to produce high quality demineralised water to feed high pressure boilers and other process units within the same plant. Characterised by the use of RO (Reverse Osmosis) membranes technology, the plant will eliminate any type of salts from the fresh water, with a production capacity of 330 m³/day.

The vast quantity of heavy equipment demanded for this energy project will make extensive use of modularised construction, executed in yards throughout the eastern Asian coast, in China, Korea and Japan. This solution will be applied also for the water treatment plant: conceived and built for a modular construction, it will be shipped from Italy to a yard in Far East Asia where it will be assembled in large ready-to-plug modules and transported by sea to the Yamal peninsula during the warm season.

But – even if the finally assembled plant will operate in a closed building with normal temperatures – the involved logistics foresee a possible storage period on site in sub-Arctic temperatures: for this reason the structural components of this equipment have been specified to resist at -50 °C!

Two different plants for Novopolotsk, Belarus
The Naftan plant of Novopolotsk in Belarus is producing Hydrogen from gas: for the production of demineralised water and the polishing of condensate the customer demanded a plant able to treat 130 m³/h of water. ARTES Ingegneria is currently supplying a complete solution featuring demineralisation and condensate polishing.

The de-oiling process is performed with GAC (Granular Activated Carbon) adsorbers, while the removal of salinity features a battery of mixed bed ion exchangers.

The same Naftan complex hosts an oil refinery that required a thorough degassing of 50 ton/hour of water destined to the boilers that supply the steam for the cracking towers. In this case ARTES Ingegneria supplied, back in 2013, a thermophysical deaerator, by far the most applied technology for the boiler feed water degassing when a reduction of Oxygen to only a few parts per billion is required. Dissolved gases are removed by steam stripping, and the steam is moreover employed as heating medium because of the reduced solubility of gases at higher temperature.

With its own proprietary ZEROGAS technology ARTES has inherited the experience in the design of deaerators that originated within the BONO Group in 1958.

The advantages of ARTES’ deaerating process can be summarised in:

• An extremely efficient mass-transfer rate, that leads to reduction of dissolved gases (Oxygen, Carbon Dioxide, volatile compounds) in water to meet the most stringent specifications
• Efficient heating of the boiler feed water to the right temperature, with a dramatic saving of the required steam
• A very compact deaerating tower, obtained thanks to the efficient packing with a high “active area / installed volume” ratio
• High reliability and low maintenance due to the implementation of 50 years of design and manufacturing experience in deaeration technology.

A similar thermophysical deaerator was supplied, in 2013, to the Lukoil Hydrogen plant in Perm, Russia. This equipment was designed with 85 tons/h capacity of deaerated water.
LNG, a Liquefied Natural Gas, is becoming more and more important as a fossil fuel to compete with crude oil all over the world. Gathered in warmer regions like Qatar it has to be transported over greater distances by sea. The Natural Gas (cooled for transport to ~163°C) is shipped in LNG tankers, which are specifically equipped for this kind of overseas transport.

**The standards for insulation at cryogenic temperatures are demanding.**

The highest priority is given to keeping low storage temperatures and to minimising expensive losses during transport. LNG storage tanks are insulated with Polyurethane foam and cargo containments are often insulated with glass fibre reinforced Polyurethane foams (R-PUF).

The latest project undertaken by Cannon Viking is a turnkey plant which will produce glass fibre reinforced foam panels, used for lining the hulls of LNG tanker ships. Cannon Viking has been working closely with GTT who are the designers and licensees of the product in order to comply with their strict guidelines and safety assessments. The plant is being installed in a purpose built factory just 3 hours inland from Shanghai.

The first phase of the equipment supply consists of temperature controlled bulk storage tank farm system, fibre glass unwind system and inclined continuous rigid foam slabstock block machine with block length cut off machine and automated stacking system, which is currently being installed. Phase two will be delivered to China by July 2021 and will concentrate on the conversion of the reinforced foam blocks into fully fabricated ready to fit panels for installation in the tankers.

Cannon Viking has worked with the Yoke management team over the last 3 years in order to bring this new manufacturing centre to fruition.

**Cannon technology for PU manholes**

**CANNON INTERWET PROVIDED TO POLIECO, ITALY, THE SOLUTION TO REPLACE CONVENTIONAL CAST IRON WITH GLASS-REINFORCED POLYURETHANE IN THE PRODUCTION OF HEAVY-DUTY MANHOLES. THE SERIES OF KIO SYNTHETIC MANHOLES IS NOW GROWING, OFFERING ATTRACTIVE COLOURS AND A WIDER SELECTION OF SHAPES AND SIZES. CANNON DOUBLED THIS YEAR THEIR PRODUCTION CAPACITY, AND THE REQUESTS KEEP FLOWING IN!**

The InterWet technology – the co-injection of rigid Polyurethane and chopped glass fiber – features numerous interesting references in several fields of the industry, from transportation to industrial air conditioning.

The products developed by the Italian firm POLIECO stand for their originality and final use: a consolidated leader in the production of large corrugated pipes in Polyethylene, the company is present with sites in Italy, France, Spain, Greece and Slovakia. Four years ago they conceived an interesting diversification from their traditional business, designing a series of round, square and rectangular manholes that are manufactured with a reinforced Polyurethane formulation.

These innovative manholes are produced at a very serious daily rate using a complete production island supplied by Cannon. Characterised by an attractive look and a perfect surface finish, the manholes manufactured under the KIO trade name are moulded in several shapes, dimensions and functions. Conventional flat covers or hole grills can be produced in sizes from 400x400 mm up to 700x700 mm or 800 mm diameter for the round ones.

Several advantages characterise these polymeric manholes:

- **Lightness**, which makes the operations of installation and maintenance easier and safer: the KIO covers weigh 70% less than the cast iron ones!
- **Solidity and resistance**: a standard model can stand the weight of up to 40 Tons
- **Electric insulation**: it protects pedestrians from electrical shock in humid environments and presents little interference with cell phone signals
- **Noise reduction**: these covers do not «clang and rattle» under road traffic
- **Resistance to corrosion** and to chemical agents: they are not subject to rust, corrosion, condensate and are completely spark-free.
- **Environment protection**: the CO2 impact of a polymeric product is several times lower than that generated by a traditional metal casting operation, resulting in a “Greener” product.
- **Customisation**: the frames or the covers can be produced in different colours for different utilities/applications, and personalised with the name of the customer, service or sponsor.

- **Last but not least, these synthetic products are not appealing for the thieves** that steal and resell the metallic ones to the scrap yards!

The Cannon InterWet plant has been doubled this year, with the supply of two new presses and of the relevant accessories. This allows the customer to work on three shifts, five days a week.

POLIECO is now producing covers with a coloured surface, and increasing the range of products to new models and sizes.

**Attractive manholes made with Glass-reinforced Polyurethane are 70% lighter than the metal ones! Various sizes and shapes are available.**
CANNON EURASIA, BONO ENERGIA, ARTES INGEGNERIA AND AUTOMATA HAVE SUPPLIED AN IMPORTANT TURNKEY THERMAL PLANT FOR PIRELLI TYRES FACTORY IN VORONEZH, RUSSIA.

Founded in 1872, Pirelli is today the fifth world producer of tyres, with a turnover of 6.11 billion Euro in 2013 and an annual manufacturing capacity of 69 million pieces.

Pirelli recently decided to expand their market share in a number of countries, including Russia, a nation characterised by a steady market growth for both cars and industrial vehicles. To face the increasing local demand, Pirelli, owner of VSZ (Voronezh Shina Zavod) in Voronezh, 500 km south of Moscow, started a general modernisation project of their production plant for industrial tyres.

In 2012, after having replaced all production machineries and having installed the best equipment available on the market, with an investment equal to 56 million Euro, VSZ decided to produce in house all the heat required by the vulcanisation process, thus interrupting the energy public utility.

The complex procurement process for a new thermal plant involved numerous potential suppliers, and the final decision was made in favour of Cannon, that was able to offer a complex solution involving different technologies.

A key role for the acquisition of this important order has been played by Cannon Eurasia, the Moscow-based company of the Cannon Group, that is authorised to sell and install turnkey plants on the whole Russian territory, holding an SRO (Self-Regulatory Organization) licence.

A new thermal plant

Three large water tubes boilers, having a total capacity of 53 thermal MW, have been supplied by BONO Energia.

The heat recovery units at flue level allow the feed water for the boiler to be pre-heated, thus increasing the energy efficiency up to 95% in full swing.

The use of inverters on all engines of pumps and fans, as well as the installation of a complex network of sensors for the constant control of combustion parameters, have allowed to cut costs for electricity needed to run the plant.

Pure water for the boilers

ARTE Ingegneria has provided the complete plant for the treatment of the feed water of the boilers, composed of a section for reverse osmosis and two degassing units. The water – about 50 ton/h, coming from the nearby Don river – is filtered and sanitised in a pre-treatment area designed on purpose to manage a wide range of polluting substances. Thereafter it is demineralised up to a conductivity value of 20 microSiemens, needed for the optimal operation of boilers. The presence of two parallel treatment lines ensures the continuity of all operations even during the maintenance periods.

The oxygen remover consists of two thermophysical deaerators that can produce 75 ton/h of perfectly degassed water; the Spray&Tray technology, patented by ARTE Ingegneria, allows to get excellent levels of CO₂ and O₂ extraction; the latter can reach minimum concentrations of 5 ppb (parts per billion).

A sophisticated process control

Automata, the Cannon Group Company specialised in industrial electronic controls, designed and installed the computerised managementsystem for the whole plant.

Three water-tube boilers by BONO Energia – with a total capacity of 53 MW – provide the needed heat for the vulcanisation of industrial tyres manufactured by Pirelli – VSZ in Voronezh, Russia.

ARTE Ingegneria provides the purification and degassing units for 50 ton/h of water collected from the river Don.
The supplied solutions include:
• One Burner Management System (BMS) LGK16, based on Siemens PLC, able to manage the combustion process guaranteeing a safe and efficient operation.
• One Boiler Control System (BCS) S7-300, also based on a Siemens PLC, for the automatic continuous control of the thermal plant.
• One Human Machine Interface (HMI), based on an Automata proprietary touch screen system, which allows the operator to control the whole system from a central point. This device includes the visualisation of trends, of historic plant statistics and of the alarms.

The control system for the thermal plant is equipped with a Wire (WinMachLite Remote Emulator), a solution for the remote supervision of the process by means of a connection with the HMI local panel installed on the steam generator. Wire is the ideal solution for the remote control of industrial processes, because among other innovative features it allows a supervisor:
• to simulate the Automata HMI in debug mode during the configuration of a new working method,
• to browse through the various pages of the HMI without interfering with the local operator activity,
• to manage the control of the HMI panel and the modification of its working parameters.

The water treatment section of this project also features another interesting Automata solution: a Load Sharing System allows for the control of the degassing system and of the RO (Reverse Osmosis) units that provide purified water to the boilers, balancing the load of water to the three heating units according to their actual workload. By doing so the system always remains at a constant pressure, thus increasing the energy efficiency of the process.

This turn-key project guarantees to Pirelli the highest operation reliability in combination with the lowest running and maintenance costs. The four companies of the Cannon Group have effectively cooperated to achieve this important job and have once more applied the successful strategy of joining the best technological resources, present in the Manufacturing Centres, with the presence and experience of a strong Local Unit.

Cannon CRESIM for Carbon Recycling: environmental sustainability and recycling awareness

IN 2012 CANNON STARTED AN EU-SPONSORED LIFE+ PROJECT CALLED CRESIM (CARBON RECYCLING BY EPOXY SPECIAL IMPREGNATION) AIMED AT DEVELOPING PROCESSING METHODS FOR THE MANUFACTURE OF CFRP PARTS USING RECYCLED CARBON FIBRES (CF).

CRESIM HAS ADDRESSED WASTE REUSE FROM A VARIETY OF ANGLES AND HAS PRESENTED A NEW INNOVATIVE MANUFACTURING PROCESS THAT CAN POTENTIALLY REUSE UP TO 100% CF WASTE AND SCRAP FROM DIFFERENT INDUSTRIES TURNING ONE OF TODAY’S COSTLY ISSUES INTO AN OPPORTUNITY FOR GREENER PRODUCTION AND MORE PROFITS TOMORROW.

An intense R&D programme was set up, which involved:
• Characterising the different types of recovered carbon fibre;
• Developing a suitable process for impregnating the types of reinforcement obtained from recovered CF;
• Characterising the test plates obtained;
• Developing new, financially sustainable applications for the process.

A major investment in laboratory space, new equipment and time of specialist staff has enabled Cannon to allocate a large portion of its refurbished R&D Centre for Composites in Caronno Pertusella, near Milan (Italy), to the CRESIM project. The lab contains a new high-tonnage hot press that can carry multiple test moulds as well as tools designed or supplied for trial by interested partners.

The CRESIM area of the R&D lab is equipped with two 6-axes anthropomorphic robots for parts manipulation and the handling of the mixer head in addition to other necessary hardware. Two different Cannon dosing units dispense the Polyurethanes and epoxy resins required to test the different types of impregnation. The dosing units are high-pressure, low-output machines running full closed-loop control of output and chemical ratios.

A staff of specialists were assigned to the project with a high degree of priority. Over the last couple of years they have developed a complete range of tools for fast resin transfer moulding (RTM).

The pilot plant is suitable for the prototyping of very large parts in recycled carbon fibre.

Visit CRESIM dedicated website for more information on recycled Carbon fibre processing technology!
The new shelters for refugees are designed to last for several years, to replace the common textile tents that last no longer than six months.

The IKEA Foundation is developing and testing a better home for refugee families, in partnership with the UN Refugee Agency (UNHCR) and Better Shelter. Cannon provides the Swedish thermoformers Safeman the innovative equipment required to produce the plastic modular shelter.

Many of the textile or plastic shelters currently used in refugee camps often have a life span of as little as six months before the impact of sun, min and wind calls for their replacement. Unfortunately, refugees can stay in camps for several years. Not only does this leave vulnerable families even more exposed to the challenges of life in a refugee camp, but it also presents a huge burden to the aid agencies and governments trying to create a more dignified life for the millions of people who have had to flee their own homes. Thanks to the IKEA Foundation’s focus on funding innovative projects and developing connections between its partners, that could be set to change.

Collaborating for the benefit of refugees

The IKEA Foundation provided to this project funding and management support. UNHCR brings the know-how and field experience, while Better Shelter – a social venture – develop the prototypes and specifications for houses that are put up in modules and can be delivered in flat packs, a well-known IKEA concept that simplifies transport.

A smart, portable shelter

The houses are designed to be easily set up and taken apart and are also easy to carry. A tubular steel structure, similar to that used for camping tents, supports modular paneling elements for the roof and the walls: these panels, made by thermforming rectangular sheets of expanded TPO (thermoplastic polyolefin), are characterised by an excellent resistance to UVs and rain. These lightweight panels are fixed one another through simple plastic buttons and, when installed, they guarantee a certain degree of thermal insulation, a complete tightness to light, wind and rain, while preserving “optically” the privacy of the family living in the shelter – a defect much criticised of the textile tents widely used as shelter until now.

Each house is fitted with a flexible type of solar power unit, which is sufficient to power one lamp, that comes with the house, and a USB port. The USB option may look odd, but it shows the high conceptual level behind the project: the refugees – right now, 3.5 million of them live in UN-provided tents! – not only demand comfort, security and dignity, but also need a way to communicate with the rest of the world, and their mobile phones, tablets and computers plug into the same four-pin ports that we all use.

The prototypes of the shelter have been tested in refugee camps in Ethiopia and Iraq and the families who live in the shelter have had a direct say in how the product is developed, contributing with their experience to this collaborative process.

The project, started in 2008, required a number of refinements prior to the definition of the ideal shelter. When the decision was made to use thermofomed plastic walls and roof, NORTEC-Cannon AS, the Cannon agency in Europe’s Northern countries, was consulted by the Swedish company Safeman for the supply of a proper industrial solution able to provide the high number of parts in a rational and fast way.

Safeman manufactures everything from custom parts to high-volume units and assembled products for the industrial sector, offering to their customers a total concept, from initial idea to finished product. They design and manufacture products and details in materials such as plastic, textile, foil, leather and metal, and were involved since the beginning in the development of this innovative shelter.

Cannon Ergos was involved with this request and responded designing a complete production solution, while offering their laboratory facilities to supply the desired prototypes for the field tests. The suggested thermofoming solution aimed to produce a totally trim-less panel: no peripheral scrap is generated in this project, contributing to the economy and the environment friendliness of the process.
A dedicated, environment-friend solution

The plant, supplied by Cannon Ergos in the first quarter of 2015, includes:

- two forming presses to shape five different types of panels served by four handling robots
- three presses to punch the holes for the connecting buttons
- five thermoforming moulds
- the heating stations for the plastic sheets
- the complete engineering of the plant
- two prototyping moulds and all the relevant production of prototypes

When fully operative, this plant will be able to produce panels for about 30,000 shelters/year.

“This is a clear example of how we use design and the design process to create benefits based on the user’s needs,” explains Anders Rexare Thulin, Chief Executive of Better Shelter “We create added value for every euro with houses that are cheap and durable.” Cannon is proud of having contributed to the project: with the supply of a complete solution – from the technological concept to the production plant, including tooling and prototyping service – Cannon Ergos confirmed once more their mission of One-Stop-Shop supplier of complex moulding plants.

We thank IKEA Foundation (www.ikeafoundation.org) for parts of the article and for the shelters pictures!
Visit their website pages dedicated to this social project.
A DELIGHT TO THE EYE CELEBRATED BY VAN GOGH IN MANY OF HIS PAINTINGS, SUNFLOWERS ARE A MAJOR SOURCE OF CLEAN, RENEWABLE ENERGY AND RAW MATERIALS. BONO SISTEMI IS DEVELOPING A COMPREHENSIVE TECHNOLOGY PACKAGE TO RECOVER ENERGY FROM SUNFLOWER PROCESSING WASTE.

To burn this material a specific solution is required. Russia and Ukraine are the countries most interested in this development. Also known as heliotrope, from the fact that it turns towards the sun, the sunflower is originally from Mexico and Peru, but it is now grown in many tropical and temperate regions of the world.

The fruit of the sunflower comes in a shell called hull. When dried, the hull comes apart to release a white seed rich in edible oil. Sunflower seeds are refined to manufacture mayonnaise, sauces, margarine, soap, cosmetics, colours and frying oil, which is rich in polyunsaturated fatty acids and has a high smoke point.

The plant's green parts are used as fodder while the fruits can be used as birdseed or are eaten by man like pumpkin seeds. Cattle-cake can be obtained from crushed seed waste. In short, the sunflower is a lot like pork: nothing gets wasted!

This year's production of sunflower seeds is estimated at 40,000 tons worldwide. In addition to Russia and Ukraine, which alone account for about 50% of the total production, the other big producers of sunflower seeds are France, Spain, Turkey, China and Argentina.

The seed hull is a source of energy. Once picked, the sunflower fruit is processed to separate the seed from its hull. The shell has a very high calorific value (3,800-4,000 kCal/kg) – twice that of common wood with average moisture content – and a very low specific weight. The combustion of this material poses a number of practical issues, all related to the high combustibility and extreme lightness of its particles. Combustion must be controlled to maximise the generated heat and prevent clogging of the combustion grate and chamber. Biomass ash is not only very light and bulky, but it is also rich in silicon, which is highly abrasive and can easily damage the metal parts it comes into contact with. Therefore, recovering energy from the combustion of sunflower seed hulls requires a technology set that leaves no room for improvisation.

BONO Sistemi has the solution. With over 50 years of experience in fuel combustion and 60 biomass fuel boilers installed worldwide, BONO Sistemi has gained significant expertise in the field of energy recovery from renewable sources. After successfully addressing the combustion issues posed by difficult materials such as winery waste, rice husk, olive waste and every type of wood, BONO Sistemi specialists have turned their minds to sunflowers. Building on their experience with extremely light and easily flammable fuels, they have developed an integrated heat recovery system complete with storage and conveyors that can provide very high energy yields (about 90%) to boiler systems running on solid fuel. The combustion process takes place in a chamber where sunflower seed hulls are burned on a travelling grate specially designed for this type of fuel.

Energy from Sunflowers

Combustion is controlled to maximise heat exchange with the tubes of the overhanging boiler. A system designed to recover heat from combustion fumes allows to increase the energy yield of the installation while emissions into the atmosphere are controlled by a large unit designed to filter and abate the generated dust.

This type of installation is ideal for the large sunflower by-product factories of Russia and Ukraine, which can produce up to 500 tons of sunflower shells and waste per day. However, BONO Sistemi can design the very same systems to fit smaller-capacity plants, which are more typical of Western Europe. Do not hesitate to submit your request for information; it will receive our utmost attention!
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Cannon owns the world’s largest collection of old plastic objects, hosted in an elegant 19th century villa in Pont Canavese, a half-hour drive from Turin. The town of Pont is located at the foot of the Alps and was once at the centre of an important network of roads that crossed the mountains – a place to trade and meet different cultures. The villa is an annexe to Sandretto’s (formerly part of the Cannon group) factory in Pont and was originally a guesthouse. The building required significant renovation and this, of course, was incompatible with keeping the Cannon – Sandretto Plastics Museum open to visitors.

Today, after more than two years of intense refurbishing, the site has been reopened. It is a non-profit cultural organisation known as the “Cannon – Sandretto Plastics Collection.”

Seven rooms host one of the richest collections of plastic materials ranging from conventional ebonite, celluloid, casein plastic and Bakelite to the most modern polymers. Brand-new graphics help the visitor familiarise with the history of polymers, the main types of plastics and their applications.

A century of research, patents and inventions has generated a huge number of products that have changed the way we live on this planet. These products are now back on display in Pont. An agreement has been signed between Cannon and the town’s government to ensure that a guide be available at all times to open the site to the visitors who booked their visit in advance.

Cannon – Sandretto Plastics Collection
Via Modesto Sandretto
10085 Pont Canavese (TO) - Italy
To book a visitor or receive more information, please contact:
E-mail: communication@cannon.com
Website: museum.cannon.com

The Plastics Collection Opens!

Hundreds of old plastic objects that have changed our lifestyle are on show in the seven restored rooms.
HE-SMART® the new frontier of Energy Efficiency

THE INNOVATIVE FIRE-TUBE BOILER IS HERE: WITH THE NEW HE SMART STEAM GENERATORS BONO ENERGIA BRINGS TRIPLE INNOVATION TO THE WORLD OF INDUSTRIAL BOILERS, OFFERING A NEW SERIES ORIENTED TO SAVING ENERGY, SIMPLIFYING PROCESS CONTROL AND MAINTAINING SAFETY OF THE PLANT.

Nowadays, for any industrial activity which employs steam in an intensive way, identifying new technologies and manufacturing ways focused on cutting energy consumption has become a priority. In fact, energy efficiency can represent the key to succeed in cutting the industrial costs of products and in turning the environmental challenge into an opportunity for economic growth. This scenario has driven BONO Energia towards the search for innovative solutions aiming at producing energy in the most effective and functional way.

This project aimed at optimising the steam generators of the STEAM-MATIC Series, that have been flagship in the industrial thermal sector for over 50 years, identifying efficiency improvements that could operate in synchrony, deriving the maximum power from the latent heat still contained in the combustion gas. So the new Steam-Matic Serie “HE SMART®” was born, the “four-star efficiency” SMART steam generator.

These innovative steam boilers can achieve a thermal performance up to 98% guaranteed, limiting the smoke temperature way below 90 °C, yet keeping a “Green” approach for what concerns nitrogen oxide (NOx) emissions.

An intelligent heart

The OptiSpark system is the “SMART” heart of this new series of high-efficiency generators. Besides controlling all variables – both on the feed water side and on the combustion air one, in a dynamic way – it also controls the flues and the electric energy consumption. Moreover, it integrates the control of all safety devices required under the law to administrate plants in application of the exemption regime as tenant, it computes dynamic and historic trends of all variables, it files all detected warnings, making the identification of the anomaly easy and sets up an e-mail service to communicate with the plant supervisors, even via smart-phone and tablet. Several customers have already chosen this new solution and are fully satisfied with it. On one hand, they have been able to verify a real saving on their bills, and on the other hand they have obtained significant funding (“White Certificates” in Italy) granted against proven efficiency only.

Advantages

The new steam generator HE Smart guarantees:
• Thermal efficiency up to 98% and reduction of NOx emissions
• Reduction up to 13% in fuel consumption
• Reduction up to 40% in electric consumption
• More safety
• Easy management of a “not supervised” plant

See here more details on the new HE Smart!

OVER THIS SIX-MONTH PERIOD, MILAN WILL BECOME A GLOBAL SHOWCASE WHERE MORE THAN 140 PARTICIPATING COUNTRIES WILL SHOW THE BEST OF THEIR TECHNOLOGY THAT OFFERS A CONCRETE ANSWER TO A VITAL NEED: BEING ABLE TO GUARANTEE HEALTHY, SAFE AND SUFFICIENT FOOD FOR EVERYONE, WHILE RESPECTING THE PLANET AND ITS EQUILIBRIUM.

IN ADDITION TO THE EXHIBITOR NATIONS, THE EXPO ALSO INVOLVES INTERNATIONAL ORGANIZATIONS, AND EXPECTS TO WELCOME OVER 20 MILLION VISITORS TO ITS 1.1 MILLION SQUARE METERS OF EXHIBITION AREA.

As their official website states: "A platform for the exchange of ideas and shared solutions on the theme of food, stimulating each country’s creativity and promoting innovation for a sustainable future, Expo 2015 will give everyone the opportunity to find out about, and taste, the world’s best dishes, while discovering the best of the agri-food and gastronomic traditions of each of the exhibitor countries".

Cannon, that celebrates this year their first 50 years of activity and was born a few kilometres away from the exhibition area, will participate to this important global meeting with some dedicated events, scheduled throughout the whole semester of show. Two major reasons to be there derive from Cannon’s strategic vision of the future.

Energy efficiency and energy saving are the two driving forces behind the Group’s development that characterised their history.

Energy Efficiency
When food is produced, it often requires immediate processing to be cleaned, cooked, packed. These operations require vast amounts of thermal energy, either utilised as steam or hot water or simply heat. BONO is on the forefront of this important segment of the industry since 1958. Thousands of their dedicated boilers and thermal fluid heaters provide heat, steam and overheated water for any sort of food and beverage processing need, from sterilisation to distillation, from washing to cooking to packaging.

Dozens of dedicated thermal plants fuelled with biomass provide a viable solution to the recovery of agriculture surplus and scrap, saving thousands of tons of non-renewable fuels and contributing to an ever increasing demand for cost saving.

Energy Saving
The whole “cold chain” which ensures the safe transport of food from their origin to our table is based on refrigerated transports and storages: large deposits of fresh product – be it vegetable, meat or fish – large containers that transport them overseas and deep into remote land regions, local distribution hubs, point-of-sale storages and displays, home refrigerators.

Cannon is a world leader in the refrigerator and panel making technology. Millions of parts – refrigerator cabinet and door, insulation panels, insulated reefer trucks – are manufactured every year using Cannon foaming equipment, with innovative production technologies that have changed the way these products are conceived and made.

Cannon Group’s interests in these two wide sectors of the human activity are spelled with innovative solutions, deriving from an intense and ongoing Research & Development work.

It would have been unthinkable for Cannon to miss the EXPO Milano 2015 occasion to present them to an international, although non-specialised audience. Several events have been organised during the six months of show, including dedicated meetings held in the auditorium of the exhibition, special Open Days in their nearby factories and guided tours to the Italian Pavilion. Here the food’s theme will be explained, in a thorough and content-rich way allowed by the Italian tradition in the business, in cooperation with Italy’s Industrial Association (CONINDUSTRIA).

The coincidence of EXPO Milano 2015 with the 50th Anniversary of Cannon will give to the Group the opportunity to celebrate, with customers and visitors, an exceptional year full of opportunities and challenges.
Thank You, Nitti!

Stefano Risso was born in Taranto on 22nd August 1934. His father Luigi was a navy officer temporarily stationed at the local naval base. His father’s career took him to Venice and Pola, where he spent his childhood before returning to Chiavari, his family’s hometown. On 10th June 1940, a few months after the start of the war, the Palestro, the ship commanded by Stefano’s father, sank into the Adriatic Sea after being torpedoed by a British submarine. Luigi Risso was awarded the Silver Medal for Military Valour and a street was named after him in the district of his hometown called “The Rocks”, where his ancestors had built wooden ships for generations. The tragedy considerably affected the life of young Stefano (called Nitti by one of his father’s batmen) for his mother opposed his ambition to follow in his father’s footsteps and join the navy.

A life around the world
In 1959 Stefano graduated with honours from the University of Genoa. His degree in mechanical engineering with emphasis on naval machines qualified him for a career as a ship’s engineer. Yet he took a job with Rhodiatoce, a manufacturer of cellulose acetate based in Pallanza, but eventually his love for the sea got the better of him and brought him back to Chiavari. He got a job at the Shell refinery in La Spezia, where he worked until the beginning of 1962, when he joined Grace.

His natural communication skills and great love of mechanics led him to take up a career in sales in 1970 studying and selling food packaging equipment across Eastern Europe and the Middle East. In 1971 Stefano married his wife, Andrea Varani, “Gigia” to him, and they became inseparable ever since. In October 1973 Stefano rejoined Afro, where he first covered Romania and later Yugoslavia – a market he helped develop with great commitment for many years thanks to his extraordinary flair for languages. In 1975 Nitti turned to the Russian market and in August 1979, after more than three years of hard work, he won the first contract for the supply of a car seat cushion production line in the region. This opened the way to an avalanche of orders for automotive applications.

Working with Gries, in March 1983 Stefano landed the first contract for the refrigerator industry in Russia. Many more followed. Soon afterwards, Cannon was able to open an office in Moscow, which Nitti directed remotely for many years. In the meantime, he had started to look further on to the East to find a way into the Chinese market. In May 1983 Stefano took part in Cannon’s first trade show in China and from the booth managed to sell equipment and machines for a record 2.5 billion lira! This is how our business in China started: a rocambolique enterprise with Stefano and his colleagues from Singapore visiting customers by day and typing out quotations at the hotel by night.

Back to the roots
Nitti retired from Cannon in 2004 and returned to Chiavari, where he could indulge his old-time love for sailing and studying the history of navigation. A keen expert on everything navy – whether civil or military, ancient or modern, domestic or foreign – Stefano Risso continued to speak at crowded conferences at Chiavari’s Lega Navale and on local TV stations until the last months of his life. Exceptionally well-read, Nitti was gifted with a formidable memory. Marine model making was yet another passion of Nitti’s, one he pursued by building sections of ancient galleons down to the tiniest detail. He would replicate on a small scale what his ancestors had built for real making perfect reproductions of legendary ships. He knew the entire nomenclature of the equipment aboard large vessels and could easily list it as if he were reading out of a manual. It was only with some reluctance that Nitti, a walking encyclopaedia, accepted to buy himself a computer for he often joked about the Internet being already “in his head”.

Cannon’s calendars
Nitti was most famous for his calendars, which he drew entirely by hand and in colour for Cannon. They depict some of the milestones of human history seen through Stefano’s eyes and featuring myriads of figures so small that it is incredible that he could draw them frehand. And yet he did, often inventing them like only his bright mind and gifted hand could. He would set the story in a context of technological innovation and enrich it with surprising historical details and a good deal of humour.

Nitti designed the first calendar of “The Evolution Continued” series back in 1994, which showed Cannon’s different plastics technologies being used already in prehistoric times! The calendar was a success and soon became a must-have item among customers and employees setting Cannon’s promotional materials apart from the competition’s. His last work, the 2015 calendar shown on this page, is about the construction of the Eiffel tower – using composites! – for the Paris Expo in 1900. In spite of the disease that had been tormenting him for months, Stefano managed to complete the calendar with great physical effort in November 2014. He also disproved the prognosis from a specialist he had seen earlier that year, who told him he had only one month to live. Stefano was a fighter all his life.

We lost a friend and an artist
We lost a former colleague, a dear friend and a remarkable artist. His jokes, his cartoons, his calendars never failed to conjure smiles, raise questions and inspire reflections. We will surely miss his answers. As the parish priest said at his funeral service, “Stefano’s boat has sailed from a port where he will never return only to navigate eternally in an endless ocean.” Thanks for everything, Nitti, and ... may you have leading wind!
BONO ENERGY HAS RECENTLY HELD A TRAINING ABOUT THERMAL OIL HEATERS WITH SERPENTINE HEAT EXCHANGERS. THE TRAINING OF RUSSIAN OZNA AND REMEKS CUSTOMERS HAS BEEN HELD IN THE FACTORY OF BONO NETRO, WITH THE PARTICIPATION OF THE TECHNICAL STAFF OF CANNON EURASIA, THE CANNON BRANCH IN MOSCOW.

The training has been organised alongside an important project for the supply of 76 thermal oil boilers (see page 9 for the details) for a total potential of 284 MW, with Siberia as final destination, where the hot fluid will serve to heat a long crude oil pipeline. The "technological challenge" is represented by the harsh climatic conditions (outside temperatures can reach -60 °C) and by the use of heavy naphtha as fuel.

A delegation of ten people – start-up engineers, technical managers, operators of boiler houses and project managers from the Russian engineering companies and from the final customers – have come to BONO Netro to begin a technical three-day training about the oven operation, the automation system, the burner, the safety maintenance for the boiler house.

BONO Energia has made available its most experienced specialists for the whole period of the training. In particular, the key aspects of the thermal oil technology, that is its main advantages compared to the use of steam under adverse weather conditions, where the use of supply water would represent a major problem have been examined. The structural aspects of the thermal oil multi-tubular solution – the unique and perfect technology for this application, as it can be easily inspected and wiped out from combustion remains – have been explained in every detail.

Moreover, the safety maintenance procedure of the ovens has been shown.

In addition to the theoretical analysis of the technology and the maintenance of the oven, assisting to a true start-up of a unit has been possible: in an area of the factory of Netro, BONO has rerun a circuit similar to the one of the project, where the participants have had the possibility to practice what they had learnt during the theory sessions. A thermal oil heater having the features of those of the project has been started, following all ignition procedures.

The participants have had the possibility to get familiar with the OptiSpark automatic control system, designed and implemented by Automata, and to watch the interaction of the oven with the safety systems and with the auxiliary devices (circulation pump, expansion tank, heating station of naphtha, etc.).

The Russian technicians – coming from a historically technically sophisticated country, as to energy, as well as highly dedicated to thermal-technology and to all its issues – were impressed by the high level technological know-how, by the professionalism, the organisation by BONO and by the deep contents of this technical training.

Hosting a training in its factory for customers coming from all over the world is one of the activities allowing BONO to be always closer to its customers, available to transfer them its knowledge and competence. This is a key factor to guarantee the complete success of a project, starting from the design phase to the start-up, for dozens of years of effective and safe service.

In an area of its factory, BONO Netro has run a circuit similar to the one of the project, where participants have had the possibility to practice what they had learnt during the theory sessions.
BONO ENERGIA

CANNON

ARTES INGEGNERIA

BONO SISTEMI

Dedicated Heat & Power Solutions
- Auxiliary Boilers
- Bio Fuel
- Thermosolar
- Steam Generators
- Hot Water Boilers
- Steam Gas Fired Boilers
- Heat Recovery Steam Generators

Water & Waste Water Treatment
- Deaerators
- Effluent Treatment
- Demineralisation Systems
- Condensate Polishing Units
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- Biomass to Energy Plants
- Biomass Hot Water Boilers
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Oil & Gas Industry

COMPOSITES Europe - Stuttgart - Germany
from September 22 to 24, 2015
Composites Technologies

CPI Conference - Orlando - Florida, USA
from October 5 to 7, 2015
Polyurethane Technologies

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