A green economy that began long ago

The term 'Green Economy' is often used and many times misused, without knowing its true meaning. It is therefore necessary, for the purposes of this article, to briefly clarify the concept …

Green economy: economic form in which public and private investments aim to reduce carbon emissions and pollution, to increase energy and resource efficiency, to avoid the loss of biodiversity and to conserve the ecosystem (encyclopedia Treccani).

From this neologism which came into force in 2015, we can start many digressions which, in the case of a company such as Continuus-Properzi, translate into a specific branch of the green economy: Green-tech. This is defined as clean energy at the service of ecology, even if only in part, making the most of or making use of, clean technologies.

The argument is quite vast but what we are interested in highlighting in this article is the presence of this 'green' connotation within the Properzi organisation before it became an actual topic. The company has always worked hard in the research and study of technology aimed at outlining green-tech in different facets - precisely a green economy that began long ago. We would therefore like to illustrate the Properzi technology in parallel with some principles/themes that distinguish this type of green economy as they occurred chronologically during the company's history, as follows:

Circular economy

2008 - Already during the 1980s, Properzi applied a sort of circular economy, systematically reusing resources and eliminating waste in following the logic of a 'circular' economy. In that era, the process fluids used in the first Properzi Casting and Rolling lines for the production of lead strip were, and continue to be, closed-loop circuits so as not to be dispersed into the environment. Moreover, the production waste, namely the lead strip trimmings, was, and continues to be, directly returned to the furnaces for re-melting, thereby avoiding any type of process scrap and therefore any waste.

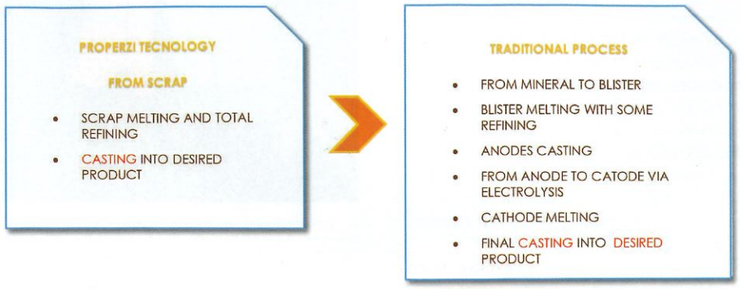
Energy efficiency

Currently, the 'Continuus-Properzi Furnaces & Combustion Division' is dedicated entirely to the engineering, design, construction and shipment of furnaces (we also organise the transportation of over-sized shipments) that serve CCR (Continuous Casting & Rolling) lines for the production of aluminium and copper wire rod.

Let's focus our attention for a moment on 'recycling' and therefore on the production of copper wire rod starting from scrap. Recycling of copper scrap is one of the best examples of a circular economy. Melting, refining and casting the desired final product according to Properzi knowhow, accumulated during 30+ years of experience, allows great economic savings and avoids additional exploitation of the mines.

Properzi's scrap recycling technology fits perfectly into this context, allowing greater energy efficiency as the production phases are significantly reduced.

Here is a clear comparison of both technologies, Properzi's technology versus traditional recycling technology:



This technology requires special furnace typology that we will describe in a detailed manner below:

2012 - One furnace, in particular, benefits from energy efficiency; it is a Properzi scrap refining furnace for the production of copper wire rod. This furnace, having a top loading configuration, can accommodate larger quantities of scrap and requires fewer door openings during the scrap loading process, which further improves its efficiency.

With the new geometrical configuration of the furnaces, by placing a large door in an elevated position served by an inexpensive skip charging machine, we are able to achieve significantly improved thermal efficiency due to the enormous quantity of Cu scrap loaded through the charging door (patented by Giulio Properzi, inventor of several new solutions serving the non-ferrous industry). The first furnace with a capacity of 250 tons per day was produced that same year. Several top-loading furnaces with capacity of 100 tons per day have been installed since then. When the charging door is on top of the furnace body, the scrap can be conveyed by a belt through a smaller door thereby minimising the escape of heat and pollutant fumes.

Properzi Vert-Melt Furnace in operation at 5 tph rate EC Rod. Photo: Properzi

Scrap Refining Furnace 250 tpd - from the engineering to the production. Photo: Properzi

Rolling mill machining operation at the workshop. Photo: Properzi

2015 - Energy efficiency is also exemplified by another type of Properzi furnace, a melting furnace that is part of the plants for the production of aluminium wire rod, called the Properzi Vert-Melt (Vertical Melting) Furnace.

The Vert-Melt Furnace is a combination of a vertical melting furnace (shaft) with a static receiving/holding chamber. It offers several advantages including: much higher energy efficiency compared to any type of reverberatory furnace (1 to 1.5 % versus 3 to 5 %), lower emissions, and 25% less gas consumption. The efficiency of the furnace is significantly increased thanks to the recycling of the heat absorbed by the molten metal from the combustion of the main burners, but also from the fumes coming from the receiving chamber.

Green business

The meaning that Continuus-Properzi gives to this chapter of the green economy is further emphasised through one of its greatest and most celebrated achievements, that is the duration of its equipment (plants) over time. There are Properzi lines that date back more than sixty years still in operation today. Therefore, we like to think that our plants are somehow 'green' from the perspective that they can always be revamped and therefore 'modernised' at any time.

We are pleased to confirm that even for our older machinery, placed in operation five, six or seven decades ago, we have kept the complete technical file for each piece of equipment including component dimensions, flow rate charts, general drawings, data, etc. This is our way of keeping alive all the Properzi equipment that has served or still serves our clients.

We can say that in addition to highlighting green business, Continuus-Properzi also displays a green vision which is strongly oriented towards innovation through their research and development. The job of the R&D department is to optimise the efficiency of Properzi plants, making them more and more competitive while continuously limiting their consumption of energy.

2020 - This year we have refined and implemented our Technical Consultancy service - outlined in different solutions: from the basic service via e-mail to the most advanced remote service resulting from the fundamental principles prescribed by Industry 4.0. After evaluation of existing systems, this service can be applied in order to obtain greater efficiency in consumption, considerable economic savings, and actual improvement in production performance.

To date, our company has invested large sums of capital in the purchase of the latest generation of machine tools, which make use of energy recovery systems and optimally sized refrigerant systems. The combination of these factors along with energy-saving control techniques, for example: evening deactivation and minimised heating phase, guarantee the reduction of energy requirements as well as integrated efficiency.

The machines in our workshop are of different varieties (Hermle C60 V Dynamic, Hermle C40 U Dynamic, FTP Romin, and DMG Mori CTX range 200 CT) and each of them is dedicated to a specific type of operation where they produce the many components which are then assembled to build our machines and complete lines.

To conclude, perhaps our company is not completely green according to the current characteristics of the modern Green Economy, but we are proud to declare that we have spanned more than seventy years in which green economy and engineering have interpenetrated one another, thereby defining who we are and what the world has come to know as CONTINUUS-PROPERZI.

www.properzi.com

Net-zero GHG pledge for Kamoa-Kakula

MAY 5 - Ivanhoe Mines has pledged to achieve net-zero operational greenhouse gas emissions (Scope 1 and 2) at the Kamoa-Kakula Copper Mine in the Democratic Republic of Congo, Robert Friedland, Ivanhoe Mines' Executive Co-Chair, announced at the 2021 Goldman Sachs Copper Day. Since the Kamoa-Kakula mine and concentrator plant already are powered by clean, renewable hydro-generated electricity, the focus of the company's net-zero commitment will be on electrifying the project's mining fleet with new, state-of-the-art equipment powered by electric batteries or hydrogen fuel cells.

A 2020 independent audit of Kamoa-Kakula's greenhouse gas intensity metrics performed by Hatch Ltd. of Mississauga, Canada, confirmed that the project will be among the world's lowest greenhouse gas emitters per unit of copper produced.

www.ivanhoemines.com

Ivanhoe in SNEL hydropower partnership

APR 26 - Ivanhoe Mines Energy DRC, a sister company of Kamoa Copper SA, signs a memorandum of understanding (MOU) in a public-private partnership with the DRC's state-owned power company La Société Nationale d'Electricité (SNEL) to upgrade Turbine 5 at the existing Inga II hydropower facility 1,400 km away from Kamoa-Kakula on the Congo River.

Originally equipped between 1977 and 1982, Inga II has been running for approximately 40 years. Four of its eight turbines have been refurbished. Turbine 5 is one of the remaining four that are awaiting an upgrade. An estimated output of 162 MW is expected to be unlocked - any surplus power produced will be distributed on the national power grid. Upgrading of the Mwadingusha hydropower plant (around 250 km away from K-K) is nearing completion to generate 78 MW of hydropower for the first two phases.

www.ivanhoemines.com

RE100 plants is objective for SKC

FEB 5 - A 44 ktpy capacity SK nexilis copper foil factory project is anounced in Malaysia. Chosen location Kota Kinabalu, the capital of Sabah Province in the northern part of Borneo Island, offers a low power supply rate and has a large-sized port and an airport, as well as a suitable 400,000 m² plot. In an electrodeposited copper manufacturing process, the copper foil is deposited on a titanium rotating drum from a copper solution where it is connected to a large DC voltage source.

A large part of Malaysia's power generation relies on renewable energy like hydraulic power generation. The six SK affiliates, including parent company SKC, have announced their resolve to push forward with RE100 (a 100% by 2050 renewable consumption commitment, with at least 60% by 2030), overseen by Brussels-based charity CDP, which has run its global environmental disclosure systems since 2000.

SK nexilis also plans to install an automated facility. It is already using unmanned transportation vehicles and robots in Factory-4 in Jeongeup, which has started commercial operations. Based on this experience SK nexilis plans to upgrade Factories-5/6 accordingly. Follow-up investments in Malaysia, Europe, and the United States are under consideration. According to SNE Research, the EV battery markets are expected to grow by 41% and 38% av, respectively, until 2025.

www.there100.org
www.skc.kr

ICSG Secretariat copper concentrates findings

APR 30 - According to the ICSG recently discussed data, copper content in the global output of copper concentrates stagnated at around 16.5 Mt Cu per year (peak 2018: 16.7 Mt) on average in 2017-2020. An important part of the production comes from many countries with low output. Contained sulphur was an estimated 20.03 kt in 2020 and iron was 15.4 kt. Copper content in exports fell 8 per cent in 2020. Chile and Peru account for 56% of export trade. China, Japan and the Korean Republic together receive 74% of imports. Impurities in copper concentrates exported in 2020 were 23.8 Mt. Only 9 of the 56 copper mines with the largest reserves presented ore grades over 1% copper. Average copper ore grades in Chile are down from 1.4% in 1999 to 0.67% in 2019. The country exported a record 12.8 Mt in gross weight at 26.7% Cu content that year.

Reported antimony, fluorine, bismuth, mercury and arsenic content rose significantly between 2017 and 2019.

Global copper smelter capacity is forecast to achieve 25 Mt Cu by 2023, with China's capacity set to exceed 10 Mtpy by 2023. Carbon emissions from copper smelters might be reduced with less smelters approved in the future, according to CNIA.

www.icsg.org