

# SmartGreen

News about the environment **Post**

## UKRAINE: THE ENERGY WAR OF THE 21st CENTURY

### NEWS

Environmental protection enters the Italian Constitution

### GREEN TECH

High energy prices, industry and the climate crisis

### GREEN BEAUTY

Calicanto, the winter flower soaked in color, perfume and history

# SmartGreen

News about the environment **Post**

SmartGreen Post is a blog on the green world, from climate change to separate waste collection. You will always be updated on news from Italy and the world, on the environment, green economy and new technologies. In addition, you can find our tips for a more eco-friendly and healthy lifestyle, as well as a section dedicated to sustainable tourism.

SmartGreen Post is part of a larger Green project that includes SmartRicicla, the separate collection app available in Italy, the United Kingdom, Ireland, Australia, Canada and the United States of America. You can download the app directly on the Play Store. For more information visit the website [www.smartriccicla.com](http://www.smartriccicla.com)

SmartGreen Post wants to be a small contribution to the protection of our planet, because to prevent catastrophe it is necessary to know and then act, each in his own small way, with simple but highly effective gestures.





Environmental protection enters the Italian Constitution

10

Stop green claims and greenwashing:  
sustainability comes to court

12

Food, fashion and digital technologies with a single focus:  
the circular economy

16



High energy prices, industry and the climate crisis

20

Geothermal energy: an opportunity  
for a sustainable future

23

Why vitamin C is important for our health

28



Rising bills, the 20 ENEA tips to save money  
and help the environment

30

Calicanto, the winter flower soaked in color,  
perfume and history

32

“Screen in Green”: the ecological transition comes to TV

35



Separate collection: how to dispose expired medicines

36



## Ukraine: the energy war of the 21st century

*Global conflicts are increasingly fuelled by the desire for oil and gas and the profits they generate. Iraq, Syria, Nigeria, Sudan, the China Sea and not least Ukraine: everywhere you look, the world is on fire. The common denominator of these theatres of war is a bewitching infusion of ethnic, religious and national antagonisms, driven by the obsession with Energy.*

The war is largely driven by the eruption of long-standing antagonisms between neighbouring, often loosely mixed clans, sects and actual peoples. In Iraq and Syria, it is a clash between Sunnis, Shiites, Kurds, Turkmen and others; in Nigeria, between Muslims, Christians and various tribal groups; in South Sudan, between the Dinka and Nuer; in the East and South China Sea, between Chinese, Japanese, Vietnamese, Filipinos and others; in Ukraine, between Ukrainian loyalists and Russian speakers aligned with Moscow. It would be easy to attribute all this to age-old hatreds, as many analysts suggest; but while such hostilities certainly help to steer these conflicts, they are also fuelled by a more modern impulse: the desire to control valuable oil and gas resources. Make no mistake about it, these are 21st century wars for Energy.

It should come as no surprise that Energy plays a significant role in these conflicts. Oil and gas are, after all, the most important and valuable commodities in the world and constitute a major source of income for the governments and companies that control their production and distribution. Indeed, the governments of Iraq, Nigeria, South Sudan, Syria and Russia derive much of their revenues from oil sales, while large energy companies – many of them state-owned – wield immense power in these and other countries involved. Despite the apparent veneer of historical enmities, many of these conflicts, therefore, are actually struggles for control of the main source of national income.

We also live in an energy-centric world where control of fossil resources (and their carriers) translates into geopolitical clout for some states and economic vulnerability for others.

Marisa Silvestri

Translator and interpreter (IT, EN, DE, FR, ES), professor of German language at the University of Basilicata and at the Scuola Superiore per Mediatori Linguistici della Basilicata. She graduated in languages in Italy and in journalism at the Eberhard Karls Universität Tübingen. She wrote for German newspapers, worked as a multilingual copywriter for advertising agencies, collaborated with important publishing houses and with companies in the renewable energy sector. The 15 years of life abroad, in environmentally sustainable countries, such as Switzerland and Germany, shaped her green nature.

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February 2022





Because so many countries depend on energy imports, nations with surpluses to export – including Iraq, Nigeria, South Sudan and Russia – often exert an influence disproportionate to their real political clout on the world stage.

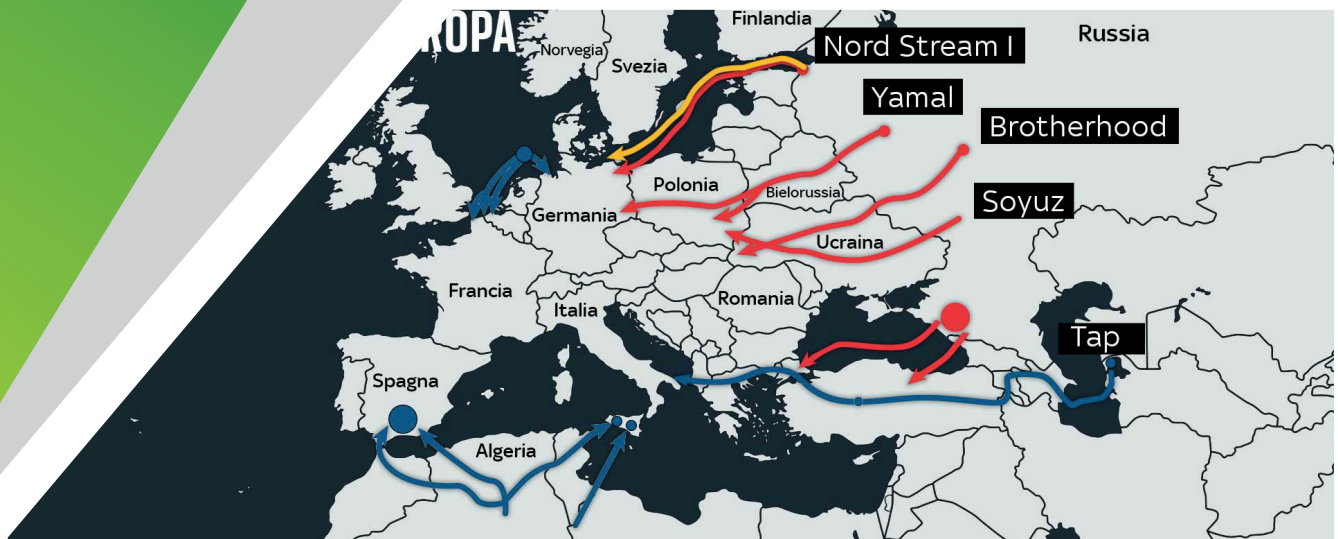
The struggle for energy resources has been an obvious factor in several recent conflicts, including the Iran-Iraq war of 1980-1988, the Gulf War of 1990-1991, the Sudanese civil war of 1983-2005, and not least the war between Russia and Ukraine that began on 23rd February. At first glance, the fossil fuel factor in the most recent outbreaks of tension and war may seem less obvious. But a closer look reveals that each of these conflicts is, in fact, a war for Energy.

### The Russia-Ukraine War

The current crisis in Ukraine began in November 2013, when President Viktor Yanukovich repudiated an agreement to tighten economic and political ties with the European Union (EU), opting instead for closer ties with Russia. This act sparked fierce anti-government protests in Kiev and eventually led to Yanukovich himself fleeing the capital. With Moscow's main ally put out of action and pro-EU forces having taken control of the capital, Russian President Vladimir Putin moved to take control of Crimea and to foment separatist pressures in eastern Ukraine. For both sides, the resulting struggle was about political legitimacy and national identity – but as in other recent conflicts, the Energy issue was also in the background.

Ukraine is not a major energy producer per se. It remains, however, an important transit route for the supply of Russian natural gas to Europe.

The news of the invasion of Ukraine by the Russian armed forces, which began in the night of Wednesday 23rd to Thursday 24th February, has inevitably gone round the world and the critical war situation taking place on European soil is constantly in the spotlight. There are currently no plans for direct intervention by NATO in support of Ukraine, as it is not a member of the organisation. However, a package of sanctions against Russia has been approved which, for the time being, does not involve the gas energy sector.



*Gas pipelines in Europe – © tg24.sky.it*

## Are we at risk of an energy crisis?

Could Europe without gas from Russia succeed? The main concern for Europe and, in particular, for Italy is mainly the supply of gas. This is why at the extraordinary summit of EU Heads of State and Government several countries were reluctant to include gas in the debate. The reason is the strong dependence of different European countries on gas from Russia, which has the largest (proven) reserves in the world.

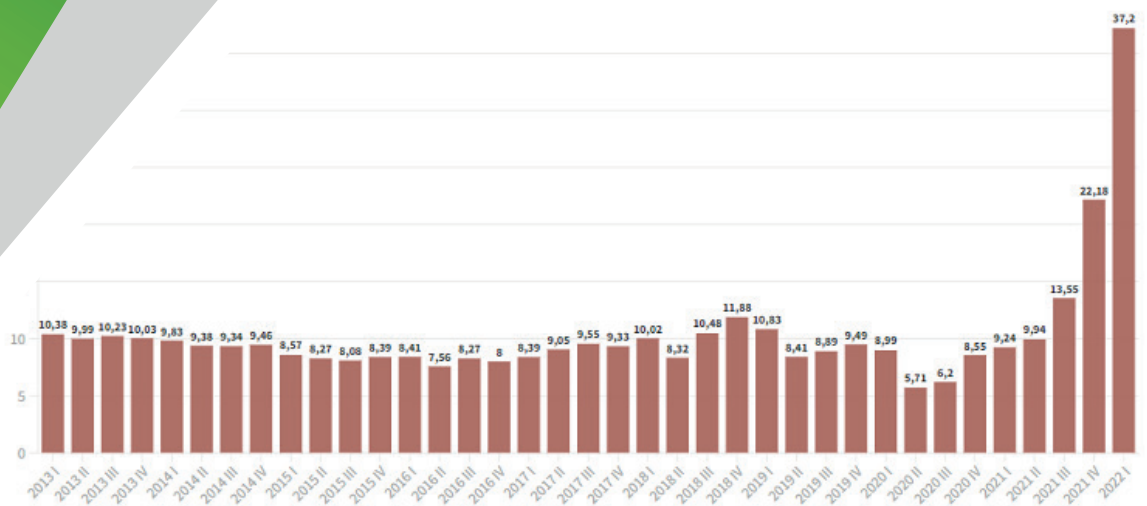
Overall, it can be said that the current supply and storage situation puts Europe in an advantageous position, both to face 2022 without Nord Stream 2 and to prepare for the coming winter; however, 2023 will start to show problems due to the progressive decrease in domestic production, combined with the lower availability of LNG supply for Europe.

## The energy crisis and its consequences for Italy

Europe can meet the demand for gas for now, but the long-term prospects are uncertain. Let's look at the situation in Italy: about 46% of the gas used in our country comes from Russia and is used to produce about 60% of our electricity.

The consequences of this dependence have already been felt loud and clear, with the soaring costs that have affected the latest bills and the closure of several businesses precisely because of these increases; costs that, with the worsening of the Russian-Ukrainian situation, are marking further rises, with the price of methane on the Amsterdam market, a benchmark for continental Europe, reaching 125 euros per MWh.

As stated by President Draghi during his briefing to the Chamber of Deputies on 25th February, the sanctions approved, those that may be approved in the future and the situation already experienced due to price increases, inevitably lead to the need to make considerations regarding the impact on the national economy and the agreements reached so far.



*Economic supply conditions for a household with 3 kW of committed power and 2,700 kWh of annual consumption in €/kWh – © www.arera.it*

The imprudence of not having diversified energy sources and suppliers more in recent decades is being felt, and this imprudence must be remedied in a timely manner to avoid the risk of future crises, given the current phase of transition, not only energy but also geopolitical transition.

The need to accelerate the transition to renewables is once again evident and put to the test by the war events of recent days. In parallel, given the inevitability of gas as a transition fuel in the coming years, all opportunities to further diversify the mix of supply countries should be explored, including the strengthening of the Southern Corridor, as well as increasing national production.

Might it be time to start thinking about the possibility of using green hydrogen alongside renewables in the future?

*“All wars are fought for money.”  
Socrates in ‘War and Peace’*

## FOUNDER

**Mario Telesca**

Computer scientist, sensitive to environmental issues, he has carried out various green projects including SmartRicicla, the app for separate collection. He has always been looking for the perfect union between science and art.

## SCIENTIFIC BOARD

**Francesco Ripullone**

Francesco Ripullone is Associate Professor at the School of Agricultural, Forestry, Food and Environmental Sciences of the University of Basilicata, where he holds the chair of the course of Ecology and Dasometry. He is deputy coordinator and Erasmus contact for the degree course in Forest and Environmental Sciences. Prof. Ripullone carries out his research in the field of forest ecology, studying the effects of climate change and natural and anthropogenic disturbing factors on forest ecosystems. He is responsible for several research projects to study the possibilities of forest decline and mortality in the Mediterranean environment.

**Angelo Rosiello**

Geologist, specialized in fluid geochemistry in volcanic and non-volcanic areas, specialist degree from the University of Perugia, in Geological Resources and Risks. I worked in the field of environmental monitoring of the underground waters of the Umbria region and took part in the volcanic surveillance works of the Campi Flegrei in collaboration with the National Institute of Geophysics and Volcanology. Winner of a PhD scholarship, with a project focused on the issue of terrestrial CO2 degassing.



## EDITORIAL BOARD

**Pierluigi Argoneto**

Graduated as mechanical engineer, has a PhD in production engineering. He is professor of the “Communication and Enhancement of Science” course and teaches Innovation Management at the homonymous master at the University of Turin. He is a consultant for innovation, technology transfer, territorial development, both for private sector and PA.

**Maria Carmela Padula**

Nutritionist Biologist and researcher, she carries out her activity in the province of Potenza after a course of high training in the nutritional field and after having obtained the Master in “Dietetics and Clinical Nutrition”.

**Maria Concetta Rizzo**

I'm a chartered accountant and specialized in tax and corporate consultancy for profit companies and third sector entities, innovative start-ups and with a social vocation, social enterprises and benefit companies. In particular, I strongly believe in the role that companies play today in ensuring a more ethical and sustainable world for future generations.

**Katia Sepe**

Forestry and Environmental Sciences Student at the University of Basilicata. My interests aim to analyze and evaluate the forest role, the management of the anthropic actions in order to increase their values and the dissemination of knowledge about the forest sector with the purpose of rediscovering its relevance for people and vegetation ecosystem.







## Environmental protection enters the Italian Constitution

The proposal for a constitutional law approved yesterday by the Parliament includes the protection of the environment, biodiversity and ecosystems among the fundamental principles of the Constitution of the Italian Republic. Minister Cingolani: "An epoch-making day, an achievement that allows us to protect the planet and future generations".

*Editorial Board*



The draft constitutional law approved yesterday by the Parliament includes the protection of the environment, biodiversity and ecosystems among the fundamental principles of the Constitution of the Italian Republic.

"I think this is an epoch-making day," commented Roberto Cingolani, Minister for Ecological Transition, who was in the chamber at Montecitorio at the time of the vote. "It is right that the protection of the environment, biodiversity and ecosystems should become a founding value of our Republic; it is an essential step for a country like Italy, which is facing its own ecological transition. For the actions we are taking today and for the consequences that there will be in the future on the next generations, this conquest is fundamental and allows us to have well-defined rules to protect our planet".



The measure, which was voted definitively in the Chamber of Deputies, amends Articles 9 and 41 of the Constitution and directly affects the Statute of the Regions with a special statute and the Autonomous Provinces of Trento and Bolzano on the protection of animals.

Article 9 is one of the 'fundamental' articles of the Constitution. It already contained the protection of the landscape heritage and of the historical and artistic heritage of the nation. With the reform, the Republic is also assigned the protection of the environment, biodiversity and ecosystems and a principle of protection for animals is explicitly specified.

The amendment to Article 41, on the other hand, states that health and the environment are paradigms to be protected by the economy, on a par with security, freedom and human dignity. The amended article also states that institutions, through laws, programmes and controls, can direct public and private economic initiative not only towards social but also environmental ends.

### **The amended articles of the Constitution (approved amendments in CAPITAL letters):**

#### **Article 9**

The Republic shall promote the development of culture and scientific and technical research.

It protects the landscape and the historical and artistic heritage of the Nation. IT PROTECTS THE ENVIRONMENT, BIODIVERSITY AND ECOSYSTEMS, ALSO IN THE INTERESTS OF FUTURE GENERATIONS. THE LAW OF THE STATE REGULATES THE WAYS AND FORMS OF ANIMAL PROTECTION.

#### **Article 41**

Private economic initiative is free.

It may not be carried out in conflict with social utility or in such a way as to damage security, liberty, human dignity, health and the environment.

The law determines the programmes and appropriate controls so that public and private economic activity may be directed and coordinated for social AND ENVIRONMENTAL purposes.

Finally, the amendments introduced by the approved draft constitutional law establish a safeguard clause for the application of the principle of animal protection in the special Statutes of the Regions of Sardinia, Sicily and Valle d'Aosta and the Provinces of Trentino-Alto Adige and Friuli Venezia Giulia.



## Stop green claims and greenwashing: sustainability comes to court

*Maria Concetta Rizzo*

Tough times for greenwashers thanks to the first case history in law. The first ordinance in Italy to punish misleading communication about green products has arrived. A change of pace that will increase the number of cases and sentences, but also improve the communication of sustainability.



### What is meant by green claims and greewashing?

A definition of green claim and greenwashing can be found in the working paper entitled “Guidelines for the implementation/application of Directive 2005/29/EC on unfair commercial practices” published by the European Commission on 25 May 2016: “The terms ‘environmental claim’ and ‘green statement’ refer to the practice of suggesting or otherwise giving the impression (in commercial communication, marketing or advertising) that a product or service has a positive impact or is environmentally neutral or less harmful to the environment than competing products or services. This may be due to its composition, the way it is manufactured or produced, the way it can be disposed of, or the reduction in energy consumption or pollution expected from its use. When such claims are untrue or cannot be verified, the practice is often referred to as ‘greenwashing’, or misappropriation of environmental virtues in order to create a ‘green’ image. Greenwashing can cover all forms of business practices towards consumers concerning the environmental

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February 2022



attributes of products or services. Depending on the circumstances, it may include all types of statements, information, symbols, logos, graphics and trademarks, as well as their interaction with colours, used on packaging, on labels, in advertising, in all media (including websites), by any organisation that qualifies as a “professional” and engages in commercial practices towards consumers”.

## **The Alcantara-Miko case**

A company that has been committed to sustainability for years has sued a competitor for using false claims, winning a historic victory in court by way of a protective order.

The case is Alcantara vs. Dinamica by Miko.

The punishment for this unfair greenwashing behaviour, awarded to Dinamica by Miko, consists in the widespread and direct dissemination to all present and future contacts (by all available digital means, including the press) of the text of the order itself.

What emerges unequivocally from this ordinance concerns in particular the rules for communicating sustainability issues that are typical of and different from those of traditional advertising: green environmental declarations must always be backed up by scientific data, proven by external certifying bodies, and must banish the generic; in other words they must be “clear, true and accurate and not misleading, based on scientific data presented in an understandable way”.

Over the years, such requests from citizens and companies will increase, and judges will play a fundamental role on the basis of this ordinance on issues of environmental protection but also against unfair practices in terms of social sustainability. The ordinance shows the need for companies to scientifically prove what they claim and communicate when describing their social responsibility actions and their social and environmental sustainability virtues.

## **Greenwashing and consumer protection**

On the other hand, it emerges that false environmental claims are damaging to everyone: consumers are being prevented from making an informed choice, companies that are increasingly environmentally aware are being harmed by greenwashing as a form of unfair competition, and the financial system is being misled into investing in companies that are not seriously committed to the ecological transition.

The ordinance is based on the fact that “awareness of environmental issues is very high today and the ecological virtues extolled by a company or a product can influence purchasing decisions”. Consumer



protection is referred to in the measure by the principles contained in the Treaty on the Functioning of the European Union (TFEU) and the Charter of Fundamental Rights of the European Union.

## Consumer protection instruments in Italy

In Italy, in order to protect consumers and the companies themselves, there is control by the Italian Antitrust Authority, which has the possibility to act ex officio to punish misconduct in the form of misleading advertising and unfair competition; the same control is provided for the protection of benefit corporations, as provided for in Article 1, paragraph 384 of Law 208/2015, its founding legislation.

There is also the possibility of reporting, even anonymously, cases or potential practices of greenwashing through a participatory platform made available by the non-profit association Save the Planet. The association, in fact, as stated on their website, “has set up a commission of experts whose task will be to assess and monitor possible actions of miscommunication towards consumers in terms of sustainability”. It will then be the responsibility of the ‘commission to assess whether there are grounds for proceedings, after requesting any additions to the report, all with the utmost scientific rigour’.

Sustainability, which has become mainstream in recent times, is indeed a business opportunity, but care must be taken to ensure that it does not become merely the ‘object’ of marketing and superficial communication. At the basis of what is communicated, not only with claims but also with the most widespread tools such as the sustainability report, DNFs and impact reports, there must be measurements with objective data and scientifically recognised methods and standards. Because as Elena Stoppioni, president of Save the Planet, said: “Either sustainability is measurable or it is not sustainable”.

## Consumer protection against greenwashing at European level

In January, the European Commission and national consumer authorities published the results of a website screening – the annual sweep to identify breaches of EU consumer law in online markets. This year, for the first time, the sweep focused on “greenwashing”.

The sweep analysed online green claims in various economic sectors, such as clothing, cosmetics and household appliances. It was found that

in more than half of the cases, the trader had not provided consumers with sufficient information to assess the truthfulness of the claim;

in 37 % of cases, the claim contained vague and general wording, such as ‘conscious’, ‘environmentally friendly’, ‘sustainable’, designed to give consumers the unsubstantiated impression of a product with no







## GREEN ECONOMY >

negative impact on the environment;

Furthermore, in 59 % of cases, the trader had not provided easily accessible evidence to support its claims. Overall, taking into account various factors, in 42 % of the cases the authorities had reason to believe that the claim might be false or misleading and could potentially constitute an unfair commercial practice under the Unfair Commercial Practices Directive. Greenwashing' has increased as more and more consumers want to buy environmentally friendly products.

Screening websites for 'greenwashing' is one of several initiatives undertaken by the Commission to empower consumers to make more sustainable choices. Other initiatives include the Green Consumption Pledge, an initiative launched by Commissioner Raynders on 25 January 2021, and the legislative proposal to strengthen the role of consumers in the green transition, which aims to provide consumers with better information on the sustainability of products and greater protection against certain practices such as "greenwashing" and premature obsolescence. This will be followed by a legislative proposal on demonstrating the veracity of environmental claims based on environmental footprint methods.

February 2022



# Food, fashion and digital technologies with a single focus: the circular economy

*Editorial Board*

The 5th edition of the Re-think - Circular Economy Forum, an event promoted and organised by Ton-do, an international organisation operating in the Circular Economy sector, has just come to an end. It was held on 10th and 11th February at the Milan Monza Brianza Lodi Chamber of Commerce and the Milan Triennale in a hybrid mode between a physical and online event.



Companies, organisations, institutions, start-ups and research bodies showed their circular path to encourage the birth of innovative and entrepreneurial activities at national and international level. Five themes were covered during the two-day event: Agri-food, Textiles and Fashion, City, Materials and Digital Technologies with a single common focus, the Circular Economy. More than 60 companies, startups and institutions were involved, presenting and describing their paths and projects in the world of the Circular Economy and sustainability.

Not only testimonials of Italian circular products and services, but there were also contributions from cutting-edge European players that enriched the forum, giving a more international flavour to the event. Among the partners of the event were the Chamber of Commerce of Milan Monza Brianza Lodi, Esselunga, ATM, A2A, UniCredit, the Consulate General of the Netherlands in Milan, Teads Italia, EPM, Fondazione Pistoletto – Cittadellarte Fashion B.E.S.T, CUEIM, representing the Interreg MED Green Growth Community with the projects PEFMED plus and ARISTOIL pluse ALMED – Alta Scuola in Media Comunicazione e Spettacolo of the Università Cattolica.

We are very satisfied with the success, in terms of both participating companies and the public, of Re-Think, a forum that UniCredit decided to sponsor with great enthusiasm because it is fully consistent with the sustainable development strategy of UniCredit Unlocked, the bank's 2022-2024 Strategic Plan," said Marco Bortoletti, UniCredit's Lombardy Regional Manager – Through these events, too, we want to increase attention to the processes of transforming economic activities from an ESG perspective to greater en-

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February 2022



environmental and ecological sustainability, which represent growth drivers for both UniCredit and the Italian system". The first day began with greetings from the institutions and an introduction to the current state of implementation of the Circular Economy at national and European level and the future prospects we are facing. Then we got to the heart of the matter, dealing with Agri-food, a sector of strategic importance for the Italian economy. Many ideas emerged, such as the need for a change in the production, processing, distribution and consumption of food, which must be the result of joint governance at local, national and international level, through the adoption of measures aimed at having an impact on the resilience and sustainability of agri-food systems.

Another key economic sector for Italy, explored during the first day of the event, was Textiles and Fashion, which is increasingly undergoing profound cultural and strategic transformations. These changes, as well as being necessary to mitigate the environmental impact of the sector, can enable fashion brands to understand how their supply chain operates and then transform the elements of uniqueness and value into a narrative that enhances the brand, its people and the territories in which it operates. The first day was also enriched by 2 round tables where the main projects implemented by companies and organisations were highlighted, as well as the communication strategies of the new circular approaches. The second day, conducted entirely in English, opened with institutional greetings and then gave space to the Cities, microcosms where 85% of GDP is produced and 75% of resources are consumed.

However, their role is changing, as they face numerous challenges such as achieving zero emissions, developing and increasing resilience to cope with external shocks, such as Covid-19. As cities increasingly aim to be circular and smart, they must rely on materials, technologies and flows that optimise and connect infrastructure with the human and social capital of those who inhabit it. "We were very pleased to be a partner in this edition of Re-Think and to participate, discussing a topic that is central to our government and to Europe," commented the Consul General of the Netherlands in Milan, Mascha Baak. "The Netherlands wants to be a fully circular economy in 2050. In order to achieve such an ambitious goal, collaboration between public and private sectors, research and civil society is essential, even beyond national borders."

Also during this day, there was no lack of opportunity for dialogue. In fact, a further round table was held on the topic of circular innovation and startups, highlighting how different companies and funds are doing and what the future investment opportunities are. During this roundtable, the birth of a new Startup Studio was also announced: Tondo Venture. The roundtable continued with a focus on the topic of Circular Materials, which are extremely useful for reducing supply chain shocks and enabling key, low-emission technologies such as digital, renewable energy, e-mobility and much more. Another important topic covered in this session was design, with an emphasis on 'Distributed Design' that ensures local production with local raw materials and extended product life, making products universally manufacturable and accessible to designers worldwide.



The day ended with a discussion on the most promising Digital Technologies and trends of the moment, with a focus on platforms, waste management and blockchain.

Most Circular Economy initiatives are individual projects focused on materials and physical resources. Scaling these solutions globally requires building digital foundations to support globally attractive circular business models and accelerate the process towards circularity.

“This edition of Re-think was also a great success in terms of the depth and breadth of topics covered and actors involved. – said Francesco Castellano, Founder of Tondo and Tondo lab – It was certainly one of the biggest events we have ever organised from all points of view; we had never reached such numbers in terms of audience and participation. It is clear that everyone’s interest is shifting towards these areas. We strongly believe that now is the time to act, to turn words into projects and to implement what we call Circular Disruption.

The Re-think event was sponsored by: European Commission, Ministry of Ecological Transition, Lombardy Region, Municipality of Milan, ASviS, AISOM, University of Gastronomic Sciences, LIUC – Cattaneo University and University of Milano-Bicocca.

Mediapartners of the event are Prometeo of Adnkronos Group, Materia Rinnovabile, Greenplanner, SmartGreen Post, SmartRicicla and Non Solo Ambiente.

For further information, you can view the videos of the speeches made during the event at this link: [https://www.youtube.com/playlist?list=PLarQF1QLckGwdcLF1scuynMhpapB8Rn\\_x](https://www.youtube.com/playlist?list=PLarQF1QLckGwdcLF1scuynMhpapB8Rn_x)



Too much light turns off the stars.

Don't waste energy.

**SmartRicicla**

The App for waste collection.



Photo by Carlotta Roda





## High energy prices, industry and the climate crisis

*Pierluigi Argoneto*

Expensive energy is a problem for competitiveness, but industrial activity must also be considered among the variables that must be part of an overall plan to tackle climate change.



We hear a lot in recent weeks about the high cost of energy.

Recent studies, such as the latest report by the Centro Studi di Confindustria, show that Italian industrial production is in sharp decline. One of the main causes is the high cost of energy. Electricity alone had an increase of +450% in December 2021 over January 2021, i.e. in less than 12 months.

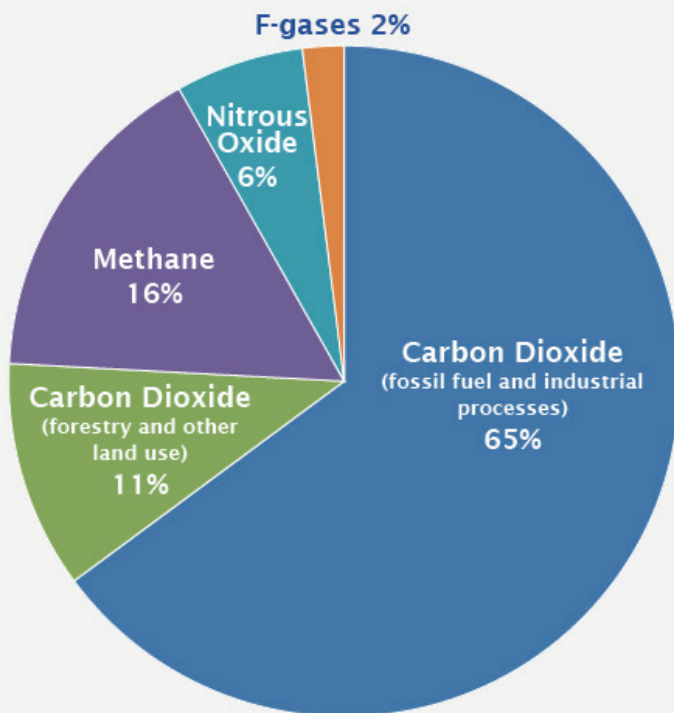
However, this figure must not be disconnected from a broader context: industrial activity must also be included among the variables that must be part of an overall plan to tackle climate change. All human activities that cause greenhouse gas emissions must be taken into account: some things, such as electricity and cars, get a lot of attention, but they are only the beginning. Cars, for example, are responsible for less than half of the emissions from transport, which itself accounts for 'only' 14% of global emissions. And there's another figure that might come as a surprise: electricity production is responsible for 'only' a quarter of all emissions.

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February 2022



## Global Greenhouse Gas Emissions by Gas



© EPA – Greenhouse gas emissions by economic sector

And yet it has a huge impact on business competitiveness: why?

Because electricity is extremely cheap, and two-thirds of it is derived from fossil fuels, which are very cost-effective. They are widely available and we have developed extremely efficient techniques to extract them and turn them into electricity. Thinking of converting the entire electricity system to zero-emission sources would raise average prices even higher. We extract electricity from fossil fuels because it is cheap, yet the cost of energy has exploded, and if we wanted to go in the direction of zero-emission sources, the cost would rise further, bringing the production sector to its knees, not to mention the social consequences.

What to do? Let's try to distinguish the three main stages of greenhouse gas emissions in industry:

- 1) we produce them when we use fossil fuels to generate the electricity that factories need to run;
- 2) we produce them when we use them to generate the heat needed for various production processes, such as smelting iron ore to make steel;
- 3) we produce it when we actually produce these materials, with the inevitable release of carbon dioxide in the process of making cement, for example.

In fact, it is precisely the industrial processes linked to the production of cement, steel and plastics that account for a further 21% of global emissions. Thinking about a climate plan without talking about these three industrial products (which I will discuss in a later section) could be a theoretical exercise.

We should therefore hypothesise a path to zero, or at least drastically limit, emissions in industrial activity and imagine a medium- to long-term way out of the difficulties currently caused by high energy prices.

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February 2022



In a nutshell, I will try to list them:

1. it is necessary to electrify all possible processes in industry. And this requires many technological innovations;
2. If the previous point is to make sense, electricity must increasingly be obtained from a decarbonised-de-fossilised source. This too will require many large-scale innovations.
3. it is necessary to absorb residual emissions from industrial processes with technology that is already available (even if still at an experimental stage). Other innovations are still needed;
4. more efficient materials must be used. Innovation.

In 2005, when the writer D.F. Wallace was asked to give a now-famous speech to the undergraduates of Kenyon College, it began like this:

“There are two young fish swimming side by side, and they run into an older fish who is swimming in the opposite direction and says, “Good morning, boys, how’s the water?” And the two young fishes keep swimming some more, and finally one of them turns to the other and says, “What the hell is the water?”



Wallace explained, “The basic point of the fish story is that the most obvious, ubiquitous and important realities are often the ones that are hardest to see and hardest to talk about.”

This also applies to innovation: it is so pervasive that it can be difficult to grasp all the ways in which it touches our lives. We only notice it when it’s missing: starting with the amount we’ll see on our energy bills.





## Geothermal energy: an opportunity for a sustainable future

*Angelo Rosiello*

The climate crisis, the ever-increasing energy 'thirst' and the ecological transition mean that a geothermally hot country like Italy needs a massive revival of studies and projects to exploit geothermal energy, giving greater prominence to our worldwide excellence in the sector and seeking to achieve energy independence or at least less dependence on non-domestic fossil resources.



The geothermal energy is a possible source of provisions, using the inner heat of the Earth and represents an effective option. Geothermal energy is a possible source of energy supply that exploits the Earth's internal heat and is, in certain geological conditions, a valid alternative to fossil fuels. In general, and especially in Italy, when we talk about renewable energy and sustainability we think almost exclusively of wind, solar and biomass; geothermal energy, on the other hand, never seems to be considered a valid alternative (though not the only one) in a national energy policy plan.

Yet it was in Italy, precisely in Larderello (Pisa), that pioneering technologies were developed to produce electricity from geothermal steam (1904), and in 1911 the world's first geothermal power plant was built, capable of generating electricity on an industrial scale, which at the time powered not only the town of Larderello in Tuscany, but also the entire city of Volterra. Tuscany is the region that represents geothermal energy not only in Italy but in Europe, hosting today the largest thermoelectric plant on the continent at Larderello, as well as some thirty other plants in the provinces of Siena, Pisa and Grosseto. In addition, Italy has a world-leading industrial sector that works almost exclusively on research projects and exploitation of this energy source abroad.



## What are the characteristics of a geothermal system?

A prerequisite for the exploitation of geothermal heat in an area is its geological structure. In general, the planet releases heat continuously from its interior (core) to the outside, and depending on the different geological structures present, there is a geothermal gradient, which expresses the variation of temperature with depth. On average, the temperature increases with depth by 2.5-3 °C every 100 metres, but it is clear that this flow is much higher in the presence of, for example, active (young) volcanic areas and/or areas with a very thin earth's crust (continental rifting and oceanic areas). However, heat loss in the subsurface is very high and influenced by many factors, so it is not sufficient to go deep enough to have a potential geothermal resource. It is necessary to have three components, which generally identify a traditional hydrothermal system:

1. a source of heat, understood as subterranean heat that becomes elevated when there is a magmatic body cooling within the crust;
2. a geothermal reservoir, consisting of hot, fracture-permeable rocks or rock formations;
3. a fluid circulating in the reservoir rocks, such as groundwater, i.e. rainwater that infiltrates and percolates into the permeable rocks where it is heated.

To avoid heat dispersion, geothermal systems are closed upwards by an impermeable covering (clay rocks), insulating the reservoir and preventing the rapid dispersion of heat towards surface. On the basis of fluid temperatures, it could be possible to classify in medium-high enthalpy systems (energy proportional to fluid temperature), as the major Italian resources, characterised by deep circuits with high temperatures (deep geothermics, with temperature greater than 150-190 °C).

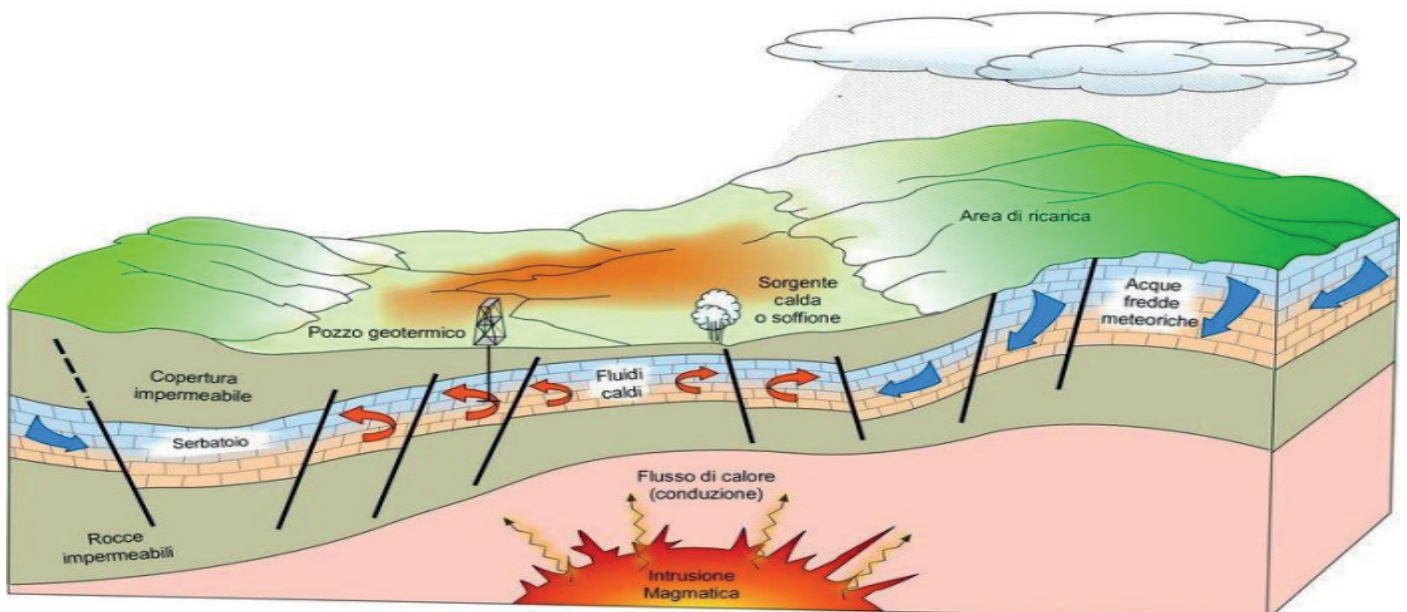
However, research into new technologies now makes it possible to consider the subsoil in general as a thermal reservoir. In this case the thermal stability of the subsoil is exploited, i.e. the fact that at moderate depths the temperature is not affected by daily and/or seasonal fluctuations (as in cellars, where the temperature is cooler in summer and relatively warmer in winter than the outside air); in this case geothermal resources are classified as low enthalpy, with temperatures below 90 °C and are also referred to as surface geothermal resources.

A further chance adding to the traditional geothermal resources is the hydrofracturing of Hot Dry Rocks (also without a real geothermal reservoir), injecting high pressure cold water in depth, to crack a potential geothermal reservoir and adsorb heat within the permeabilized rocks. This technique was tested in lots of worldwide countries and was defined Enhanced Geothermal Systems (EGS), or rather third generation systems increasing the thermoelectric power plant's performance and allowing to install a power station also in locations without a real geothermal reservoir. In this case it's used the normal thermal gradient, producing an artificial deep fluids circulation and extracting heat at defined depths.





Geothermal fluids are the thermal energy carrier towards surface and were used both as a vapour phase (gas with medium-high enthalpy and so high temperatures) both as liquid phase (low enthalpy and low temperatures) respectively for thermoelectric production and for heat production in several applications. In Italy and in other regions, also anciently geothermal energy was used for thermal and health and more recently for thermoelectrical production (only for high enthalpy systems); other applications are air-conditioning of buildings, industries, in farming greenhouses, aquaculture and several industry processes, through heat pumps and district heating using low enthalpy resources. Regarding the energy request and for minimizing energy scattering, a geothermal plant is characterised by deep well systems thanks to which it's possible to collect geothermal waters and at the same time to re-inject cold waters (after cooling) into the system. This for integrating the natural recharge by meteoric waters, always affected by climate factors.



*Schematic representation of a geothermal system (source: Unione Geotermica Italiana, UGI)*

### What are the advantages and disadvantages of geothermal energy?

Geothermal energy is considered a renewable, clean and practically inexhaustible source of energy, as the 'internal heat' component of the planet is practically perennial, considering a time scale based on human life. The environmental impact is practically zero in terms of emissions, as there is no production of CO<sub>2</sub> or fine dust (as there is no combustion); it is an energy source that is independent of the climatic factor (solar, wind...) and is able to produce 24 hours a day, guaranteeing better yield and continuity of operation. Thanks to technological advances in the sector, it is possible to produce electricity and heat at the same time (co-production) and/or to plan "cascade" uses, integrating different techniques capable of exploiting the resource at progressively lower temperatures.

But as with all energy sources, there are disadvantages that must be mentioned. For example, in terms of

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February 2022



renewability, geothermal energy in the medium and long term requires certain considerations: the fluids involved are rainwater that recharges the natural system by infiltrating at depth; therefore, if the rate of extraction/exploitation of the resource is greater than the rate of recharging of the natural system, it is depleted, even though it is a renewable source. In addition, excessive groundwater extraction without replacement at depth leads to a problem of induced subsidence, without considering that geothermal water is often chemically enriched in toxic substances due to the interaction of gas-water-rock at high temperatures (e.g. boric water...), posing a problem of disposal.

One of the solutions currently being adopted is the technique of re-injecting process water at depth, both to mitigate the problems of induced subsidence and to improve the yield of recharging the system, as well as to partially solve the problems of disposing of potentially toxic water.

In addition, it must be considered that the heating process at depth is not immediate, so a certain amount of time is needed to allow the reservoir rocks to transmit the heat to the fluids, which is not always in accordance with production requirements. Some disadvantages can be linked to the initial costs of drilling (with the risks associated with such operations) as well as to an environmental impact that in some cases is due to the bad smells that can be released from the plants (which can be completely resolved, however, with monitoring systems and chemical abatement).

Italy is an extraordinary region from both a geological and a volcanological point of view, where different geodynamic conditions coexist (subduction of the Adriatic plate with arc volcanism, oceanisation of the Tyrrhenian Sea, crustal thinning of the western part of the peninsula), thanks to which geothermal exploration, which had great impetus during the oil crisis (1976) and until the 1990s, has revealed great potential.

At least 4 macro-areas have been identified, corresponding to:

1. Tuscany, from Larderello to the Bolsena caldera (northern Latium), with a NW extension into the Ligurian Sea;
2. Campi Flegrei in Campania
3. Southern Tyrrhenian Sea, close to the volcanic arc of the Aeolian Islands;
4. Sicily Channel, from the submarine volcano of Empedocle to Lampedusa.

State-subsidised exploration in this sector came to a halt in the 1990s, when the oil crisis receded and drilling came to a halt, halting all research and development (on a national scale). The climate crisis, the ever-increasing energy 'thirst' and the ecological transition impose on a geothermally hot country like Italy a massive resumption of studies, but above all of projects for the exploitation of resources, giving greater prominence to our world excellence in the sector and seeking to achieve energy independence or at least a reduced dependence on non-domestic fossil resources.



It's time to turn the stars back on.  
*(Guillaume Apollinaire)*

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**SmartRicicla**

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## Why vitamin C is important for our health

A healthy, balanced and varied diet, rich in foods with the properties of vitamin C, can provide the body with bioactive compounds with anti-inflammatory and immunostimulant properties. The consumption of vitamin C-rich fruit and vegetables, based on the seasonality and territoriality of the products, maximises the quality of the nutrients and bioactive molecules contained in the vegetables, as well as the aromas and flavours, and protects the environment by reducing emissions and the use of plant protection products.

*Maria Carmela Padula*



The term citrus fruit comes from the Latin 'agrumen' (sour taste). The distinctive flavour of oranges, mandarins, clementines, lemons and grapefruit is known to most people, certainly to a greater extent than their extraordinary health properties. Citrus cultivation in Basilicata was introduced by the Arabs and was initially located along the Agri and Sinni rivers, thanks to the availability of water. The spread was possible because Lucanian farmers multiplied many local ecotypes mainly on the Ionian coast, which has a particularly mild climate and very fertile soil.

Belonging to the Rutaceae family, subfamily Aurantioideae, genus Citrus, citrus fruits are a very important source of phytonutrients or bioactive molecules. The nutritional importance of citrus fruits was already known at the end of the 18th century, when large quantities of the fruit were shipped on ships to prevent scurvy, a disease caused by a lack of ascorbic acid (vitamin C).

It is a water-soluble vitamin, which cannot be synthesised or accumulated in the body, but must be taken regularly through the diet. The recommended daily intake of vitamin C for an adult is 100 mg per day in males and about 80 mg in females, while for pregnant women and nursing mothers the recommended ration increases to 100 mg per day and 130 mg per day respectively. As well as dissolving in water, vitamin C is sensitive to high temperatures, so it is completely lost when cooked in water. Therefore, the main sources of vitamin C, apart from citrus fruits, are fresh vegetables (fruit and vegetables) such as: kiwis, strawberries and red fruits, peppers, tomatoes, broccoli, cabbage, Brussels sprouts, spinach etc...



February 2022



Vitamin C is essential for human health as it helps neutralise free oxygen radicals responsible for oxidative stress, a form of chemical stress responsible for damage to the body's cells and, consequently, for many human diseases and the physiological process of ageing. Vitamin C also improves intestinal absorption and thus the bioavailability of non-haem iron, contained in plants. Antioxidant, cholesterol-lowering, antiviral and anti-carcinogenic properties have also been attributed to other phytochemicals that are very abundant in citrus fruits, known as terpenoids, which are responsible for the plants' defence strategy.

Carotenoids, which provide the orange-red colour to fruit and vegetables, are powerful antioxidants with therapeutic effects in a number of diseases including cardiovascular disease and osteoporosis, but also act against inflammation and cancer.

Another class of bioactive molecules that citrus fruits are rich in are polyphenols, in particular flavonoids and anthocyanins. The effects of flavonoids include mainly antithrombotic, anti-ischemic, antioxidant and vasorelaxant, as well as anti-inflammatory activities. Anthocyanins are pigments not only endowed with antioxidant capacities, but also able to influence the expression of proteins involved in the regulation of inflammatory processes and related to tumour progression.

Closely linked to its proven antioxidant power is its anti-inflammatory and immunostimulant action, as it is involved in fundamental processes for defence against external pathogens. It is no coincidence that, in the context of the COVID-19 pandemic we are currently experiencing, vitamin C has often been 'invoked' for its preventive or even curative effects on SARS-CoV-2 pneumonia. To date, there is no robust scientific evidence in favour of vitamin C supplementation as prevention and treatment for COVID-19.

On the other hand, it is well known, as supported by various authoritative scientific studies, that the evolution of the disease is linked to hyperinflammation and respiratory distress in affected patients; in other words, the most serious complications of COVID-19 are due to a storm of cytokines, i.e. molecules that play the role of communication signals between the cells of the immune system, with a pro-inflammatory action.

A healthy, balanced and varied diet, rich in foods with the properties described for vitamin C, can, in general, contribute to significantly lowering inflammatory markers and providing the body with bioactive compounds with anti-inflammatory and immunostimulating properties. Not so much the individual food, but the combinations of various foods (nutritional patterns) that we introduce into our bodies can stimulate specific metabolic pathways and functions within the body.

Scientific evidence suggests that, in particular, fruit, vegetables and legumes contain high amounts of health-promoting molecules, being an incredible reservoir of functional molecules, as well as vitamins and minerals.

In this context and in the light of this evidence, the importance of taking adequate amounts of vitamin C on a daily basis is clear, especially at this time of year and in view of the current health emergency, as their consumption respects the seasonality of the vitamin, which enhances the benefits described.





## Rising bills, the 20 ENEA tips to save money and help the environment

As every year, the 18th February marks the World Day of Energy Saving and Sustainable Lifestyle. Never as in this moment, in which the themes of sustainability and attention to the environment play a key role in everyday life, it is important to take part in the change by choosing a sustainable lifestyle. Here are some small waste-eliminating tricks. Watch out for stand-by and fridge!

*Editorial Board*



Against expensive bills and energy waste, on the occasion of the World Energy Saving Day of 18 February, ENEA presents a guide in 20 points to save on consumption and help the environment. The guide contains tips on good practices to be applied and mistakes to be avoided by the Energy Efficiency Department of the Agency: 10 tips relate to the efficient use of heating (Decalogue heating) and another 10 the 'intelligent' use of energy. But not only. Just a few daily behaviors to save up to 10% on the bill: for example turn off the lights and heating when we leave home, do not open the windows if there is the thermo on and turn off the PC if we do not use it. It is also important not to exceed the temperature in the house, or over 20 degrees.

Among the most effective moves to cut consumption (and expenses) LED bulbs, with which you can get an energy saving of about 85%. Even high energy class appliances are an effective antidote to high energy costs: the difference in spending between having a refrigerator + washer + dryer + dishwasher + oven + heat pump in the home of high energy class and the lowest energy class is up to 40%.



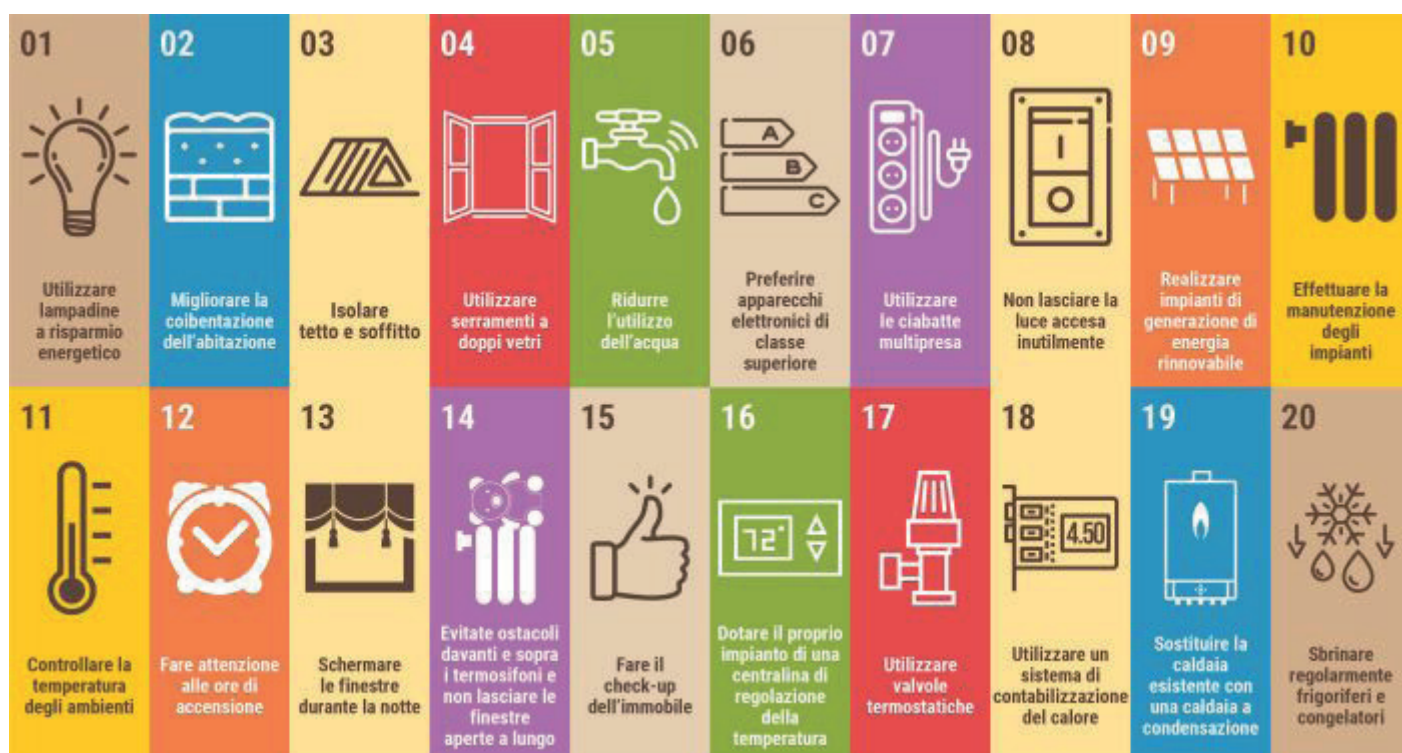
February 2022



Attention also to small gestures such as shielding the windows during the night with blinds, shutters or curtains to reduce heat loss and turn off the stand by: in fact, those that seem harmless lights can weigh up to 10% on the bill if left on all the time.

“For this it is good to use special devices such as standby stops,” explains Nicolandrea Calabrese, head of ENEA Laboratory of Energy Efficiency in Buildings and Urban Development. “But even more incisive actions are possible – he adds – as the maintenance of the plants, the check-up of the building (energy diagnosis), the control and constant regulation of the temperature of the environments up to more structural interventions to improve the insulation. An intervention, this, for which there are several incentives that make it economically more sustainable.

Among the mistakes to avoid, forgetting to defrost fridge and freezer: if they accumulate too much ice, consumption runs; in the same way, pay attention to clothes hanging out to dry on the radiator or the sofa in front of the radiator and the lights on when you leave a room.



Other cost-cutting solutions concern the type of boiler: condensing models allow to save up to 22% of methane gas compared to traditional ones (in an apartment of 130 square meters) while thermostatic valves on radiators allow to obtain a saving of about 13% of methane gas consumption.



## Calicanto, the winter flower soaked in color, perfume and history

*Katia Sepe*

Calicanthus is a symbol of protection and strength. Its uses and benefits make it a shrub with many beneficial properties: from psychological to purifying. Native to China, it is easy to grow as an ornamental variety. Let's find out what it is all about.



Calicanthus is a shrub native to China belonging to the calycanthaceae family. The shrub gives winter blooms (regardless of the climatic conditions) and from this comes its Greek name "Chimonanthus" literally "winter flower". The main characteristic of the flower is the intense scent, delicate and intoxicating, perceptible directly on the plant. If the flowers fall or are cut away, the particular fragrance will be removed. The most common species of calicanth, resistant and rustic, is the chimonanthus praecox: its waxy flowers – of yellow colour externally and red-purple inside – bloom well before the plant has begun to produce the leaves. The shrub is therefore seemingly dry, in February-March, but covered with many and fragrant flowers in the shape of a bluebell.

### Calicanto: legends and symbologies

It is said that a small robin, after a long and tiring flight, sought shelter from the cold and a place to rest – among the branches – but no tree wanted to help him. Exhausted and cold, the stubborn robin tried to rest on a small branch of calicanto that, with amazing kindness, offered him shelter and warmed him with

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February 2022





his last yellowed leaves. The Lord, to reward the generous little tree for the beautiful gesture, let fall on its branches a rain of bright and fragrant stars that soon turned into flowers. Since that day the calicanto gives intoxicating and showy blooms to anyone who meets him in winter. Because of this narrative, in the language of flowers and plants, calicanth is a symbol of affection and protection.

Another legend tells the story of a dying child with a final wish: to hold a flower between his small and fragile hands. No plant responded to his mother's desperate and tireless cry for help, except for the calicanto. Its gems opened and a beam of light swept away the naked branches on which appeared many, extraordinary, buds. The child – with the yellow and fragrant flower – recovered from his illness. Therefore, in addition to protection and affection, the calicanto symbolizes tenacity in hostilities and the ability to respond forcefully to the challenges of life, sometimes cold and raw: just like the flower of the calicanto that does not fear frost and gives everyone its lively bloom, so we too can overcome adversity and "blossom" at any time.



### Properties and benefits of Calicanto

Calicanto is rich in plant hormones and acts as a natural tonic able to generate a state of well-being and sparkling energy. The scent alone helps against stress and fatigue restoring serenity and good vibes. The dried flowers of calicanto, together with ginger and lemon balm roots, can be used to prepare purifying





and relaxing herbal teas. Be careful not to mix the seeds with the flowers as the latter are poisonous and extremely dangerous if ingested.

The plant is effective against problems related to the winter season, therefore its essential oil is a practical remedy against redness and irritation from frost. In addition, a few drops of calicanto oil in the radiator diffusers improves the quality of sleep and makes the awakening, as much as possible, less oppressive!



### Cultivation and care

Calicanto, because it is rustic, does not require special care and can be easily cultivated. It requires drained soils to avoid water stagnations. It is essential to provide, cyclically, organic substances (compost) so that it can develop in a luxuriant way. The exposure must be balanced between areas of shadow and those of light: the calicanto does not fear frost, so it should not be placed in places excessively sunny. No need for large watering. In summer it is possible to intervene with moderate water supplies according to the degree of dryness of the soil, in winter the typical rainfall of the season is often sufficient. Among the treatments to be repeated periodically, it is recommended the pruning operation – of excessively dry or extended branches – in not particularly humid days in order to speed up the healing of the wounds made with the cut. The calicanth can be cultivated both in pot and in the garden, but due to its ample shrubby conformation, it is preferable to plant it in the garden so that it can exhibit, in an optimal way, its growth potential.

“You think it’s all over, but then there’s always a robin singing.”

Paul Claudel

February 2022



## “Screen in Green”: the ecological transition comes to TV

The Italian Ministry of Ecological Transition has launched a competition - organised together with the Fondazione Sardinia Film Commission and the Premio Solinas - which is awarding screenplays for shorts, TV series and feature films with a strong environmental connotation.

*Editorial Board*



The call for entries for the ‘Screen in Green’ competition is now online on the website of the Italian Ministry of Ecological Transition. This is a film and audiovisual competition set up at the instigation of the Ministry for Ecological Transition to promote environmental issues in writing for television and film and is open to all young people aged between 18 and 30. Short films, series subject or for a feature film: there are three categories of the competition. The aim is to graft green content onto television productions, and to do this, we start with the writing process, stimulating and promoting the choice of themes for fiction that have a strong environmental connotation.

A professional jury will evaluate the works and select winners in each category. The short film scripts will then be submitted to audiovisual producers for production. The deadline for participation is the 28th February. The competition has been organised by the Fondazione Sardegna Film Commission with the support of the Premio Solinas and will be promoted with the collaboration of Green Cross Italia. “Screen in green” is part of the various education and information initiatives on ecological transition.

For info write to: [filmcommission@regione.sardegna.it](mailto:filmcommission@regione.sardegna.it)

Here is the announcement of the competition: [https://www.mite.gov.it/sites/default/files/archivio\\_immagini/comunicati/SCREEN%20IN%20GREEN%20-%20rev%20dec%202021.docx.pdf](https://www.mite.gov.it/sites/default/files/archivio_immagini/comunicati/SCREEN%20IN%20GREEN%20-%20rev%20dec%202021.docx.pdf)

February 2022



# Separate collection: how to dispose expired medicines

*Editorial Board*

Expired medicines are harmful to the environment and human health. Find out how to properly dispose of them in our article in collaboration with SmartRicicla



Expired medicines cannot be sent for separate collection because they are dangerous urban waste and must be disposed in a different way. The mistake that many commit, out of laziness or misinformation, is throwing expired medicines into the unsorted waste. To properly dispose of them, however, you will need to collect them and deliver them to a collection center or more simply to the pharmacies or medical clinics where the appropriate bins are located.

It is very important to correctly separate expired or advanced medicines from other wastes because they can cause enormous damage to the environment and human health. The medicine residues reach the purification plants, surface waters, drinking and groundwater. Contrary to popular belief, drug molecules are difficult to degrade and persist for a long time, accumulating and generating chemical pollution that in the long run can significantly alter the balance of the aquatic ecosystem.

For humans, the risk associated with the intake of contaminated drinking water is very unlikely, given the efficiency of the water purification systems. However, prolonged exposure over time to these substances could lead to an increase in allergies or to a lower effectiveness of antibiotics. In particular, the residues of

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February 2022





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antibiotics that end up in rivers also fight the bacteria useful for the aquatic ecosystem; moreover, coming into continuous contact with antibiotics, the bacteria become stronger and stronger, which facilitates the development of dangerous strains resistant to the active ingredient.

The first rule to properly dispose of expired medicines is to differentiate the packs in which the drugs are contained, before throwing them: separate the blisters and plastic or metal packs from the paper box and the package insert, inserting them in the usual collection containers differentiated for plastic and metal and for paper. Empty glass bottles are placed in the glass bells. Only in the event that there is a residual liquid medicine, it must be kept inside its own bottle and thrown into the container in the pharmacies. Removing the packaging increases the space in the container for other expired medicines and paper, plastic, metal and glass are correctly differentiated.

In collaboration with SmartRicicla we have compiled a list of the elements that must be placed in the special bins for the collection of expired medicines present in pharmacies:

### WHAT YOU CAN CONFER

- syrups;
- tablets and tablets;
- bottles with medicine residues;
- ointments;
- injection vials;
- disinfectants;
- syringes, being careful to cover the needle with its cap.

### MUST BE CONFERRED SEPARATELY

- packaging – often made of paper and must be disposed of with it, as well as the package leaflet;
- empty blisters, tubes and sachets – once the drug has been used, the package must be disposed of in the appropriate containers depending on the material it is made of.
- supplements – they are not real drugs and therefore should not be placed in pharmacy binders. The box (in the paper), the blister (in the plastic) and the integrator (in the undifferentiated) can be differentiated.
- blisters and bottles – if they still contain the drug, they must be disposed of in the pharmacy.
- syringes, thermometers, disinfectants and the like must be disposed of according to the rules of your town.

February 2022





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