



Project co-financed by the European
Regional Development Fund

WECAREMED
ToWards thE CARBon offsEtting in MED
EVALUATION REPORT
DELIVERABLE 2.5.1

Dissemination Level: Public

Document Status: Final

September 2022

September, 2022

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Document Information

Project acronym INTERREG MED WECAREMED

Project title ToWards thE CARbon offsEtting in MED

Project website wecaremed.interreg-med.eu/

Programme priority axis Priority Axis 2: Fostering low-carbon strategies and energy efficiency in specific MED territories: cities, islands and remote areas

Programme specific objective 2.2 : To increase the share of renewable local energy sources in energy mix strategies and plans in specific MED territories

Deliverable type Tool

Date of delivery September 2022

Deliverable title

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Version History

Issue Date	Version	Author	Partner
30.09.2022	1.0	E. Lagomarsino, M. Bertolini and F. Pintus, L. G. Greco, C. D'Alpaos, C. Dosi, M. Moretto, D. Melas, S. Kontos, K.Tolia, N. Liora, E. Giama, A. Poupkou, S. Keppas, S. Cheristanidis, P. Kalabokas, S. Solomos, S. Papadogiannaki	CRIEP, AUTH

Interreg MED, project WeCareMed

EVALUATION REPORT - Deliverable 2.5.1

About this deliverable

As part of the project WeCareMed, the Deliverable 2.5.1 aims to summarize the different contributions of CRIEP inside the framework of the project's objectives. Specifically, the current document is structured as follows: the first section provides advices and a practical guidance for the monetary valuation of the carbon emissions produced by Interreg MED projects, reviewing the existing international and European carbon pricing initiatives and considering all the available and accessible time-series of carbon prices. After a careful examination, recommendations are proposed on which one of them should be used as a reference in the WeCareMed project and how often it should be adjusted to closely reflect carbon market trends; section 2 reportes a deep overview on the carbon compensation framework, analysing the main type of carbon offset projects and the related features useful for their evaluation, with a specific focus on past and current offset projects in the MED and ENPI area; given the information collected, section 3 provides practical guidelines for Interreg MED applicants who would like to start the formal process aimed at purchasing carbon credits and compensate their project activities' GHG emissions.

A. Pricing Carbon Emission for Interreg MED Projects

1. Introduction to carbon pricing

Carbon pricing is a policy instrument used to reduce greenhouse gases (GHG) emissions and mitigate climate change. As GHG emitters do not pay for the negative externalities they impose on society, carbon pricing represents a way to correct this market failure by setting a price per each tonne of emissions produced and, thus, incentivizing a cut in the use of fossil fuels and the development of energy-saving and cleaner technologies.

The two main carbon pricing mechanisms are emissions trading systems (ETS) and carbon taxes. An ETS, or cap-and-trade system, sets a limit to the tonnes of emissions allowed at a regional, national, or sub-national level in a given period (quantity control) and, accordingly, a corresponding number of permits (one per each tonne of emissions) are distributed among emitters. The initial allocation of permits is provided for free or through an auction and, subsequently, issuers with a positive net emissions balance can sell their excess permits on the market. By creating supply and demand for emissions permits, an ETS establishes a market price for GHG emissions. A carbon tax, instead, consists in imposing an explicit tax rate on each tonne of GHG emissions (price control) and letting the market forces determine emissions reduction.

Another explicit carbon pricing mechanism is carbon crediting where tradable credits are created from voluntarily implemented emissions reduction or removal activities. Credits can be issued either under international or domestic mechanisms or by independent organizations and their price is determined by their exchange in compliance or voluntary markets, respectively.

Globally, the number of countries that have implemented these carbon pricing mechanisms has grown rapidly in recent years. In

2003, almost no global GHG emissions were priced. Today, the share is 21.5% and growing. Figure 1 summarizes the 65 implemented regional, national, and subnational ETS and carbon tax initiatives. Of particular relevance has been the establishment of the Chinese national ETS that started operating in 2021 and is estimated to cover more than 4 billion tCO₂, accounting for 12% of global carbon emissions.

For what concerns carbon crediting, a new international crediting mechanism is being developed under the Paris Agreement that will replace the two compliance programs established by the Kyoto Protocol (i.e. Clean Development Mechanism and Joint Implementation). The only other mechanisms implemented with a legislative mandate and supporting procedures are placed in Canada (British Columbia, Alberta, and Quebec), California, Colombia, Spain, Switzerland, Kazakhstan, China, Thailand, Korea, Japan, and Australia. Numerous other independent initiatives exist and operate in the voluntary market.

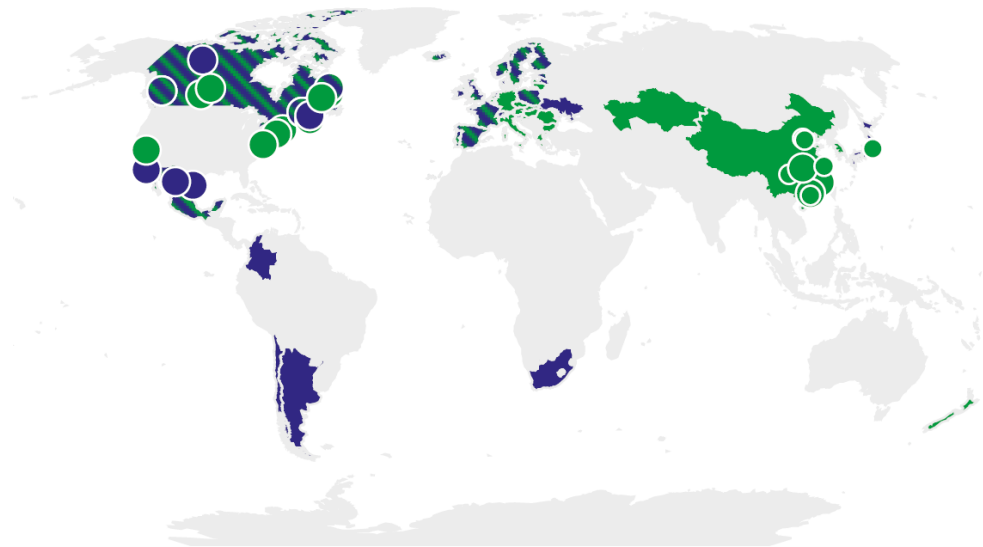


Figure 1: Overview of carbon pricing initiatives in 2021. ETS initiatives in green, carbon taxes in blue.

Source: From The World Bank, "Carbon Pricing Dashboard," last updated Apr. 1, 2021, https://www.carbonpricingdashboard.worldbank.org/map_data.

According to the World Bank's annual "State and Trends of Carbon Pricing" report, the observed carbon prices vary widely among different systems. The latest comparable figures show that in April 2021 ETS prices ranged from US\$ 1.18 in Kazakhstan to US\$ 49.78 in the EU (Figure 2) and carbon tax prices ranged from US\$ 0.08 in Poland to US\$ 137.24 in Sweden. Outside Europe, more than half of the existing carbon pricing systems charge less than US\$ 20.

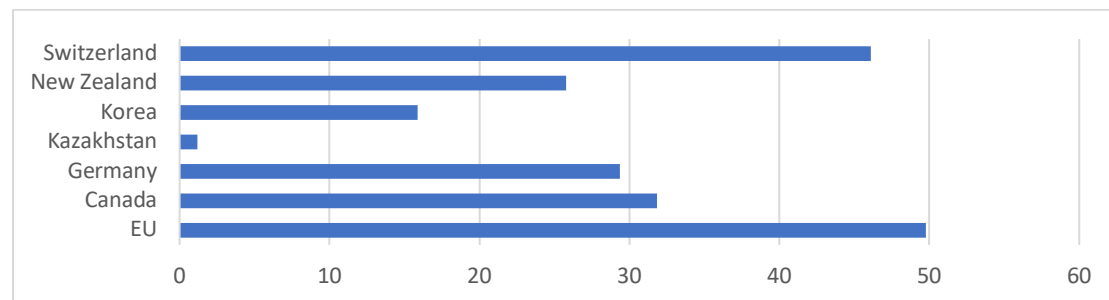


Figure 2: Nominal prices in implemented regional and national ETS initiatives in April 2021 (US\$/tCO₂).

Source: Data from "Carbon Pricing Dashboard" by The World Bank, last updated Apr. 1, 2021. https://www.carbonpricingdashboard.worldbank.org/map_data.

Regarding the prices of carbon credits, data on certificates emissions reduction (CERs) show an average price of US\$ 0.30 in 2020 in the international compliance market, and the "State of the Voluntary Carbon Markets 2021" report by Ecosystem Marketplace indicates an average of US\$ 2.51 in 2020 in the voluntary market.

A major critique of existing carbon pricing systems is that their price is too low to effectively lead to a reduction in GHG emissions consistent with achieving the temperature goal foreseen by the Paris Agreement. In line with classical economic theory, many economists argue that the carbon price should be tied to the social cost of carbon (SCC)— an estimate of the cost of the damages created by emitting one additional tonne of carbon dioxide into the atmosphere— as it represents the economically optimum price at which the associated marginal costs of mitigation would equal the marginal benefit of mitigation. Over the years, the scientific economic literature has proposed numerous SCC estimates based on varying assumptions

and using, typically, integrated assessment models. The U.S. plays a major international role in setting the SCC: the U.S. government began to calculate the SCC in 2010 when the Inter-agency Working Group (IWG) was established. The most recent estimates calculate a value of US\$51 per tCO₂ in 2020 and US\$62 t CO₂ by 2030 (IWG, 2013)¹, but the Biden Administration has recently committed to a comprehensive update by early 2022 (IGW, 2021). Using a different approach, the “Report of the High-Level Commission on Carbon Prices” estimated that achieving the Paris Agreement’s goal would require a global carbon price of at least US\$40-80 per tCO₂ by 2020 and US\$50-100 per tCO₂ by 2030 (High-level commission on carbon pricing, 2017).

Today, the most debated issue on carbon pricing concerns carbon leakages – i.e. in a country with ongoing carbon pricing initiatives, companies could move carbon-intensive production abroad to take advantage of lax standards, or local goods and services could be replaced by more carbon-intensive imports. Along this line, the European Commission has recently published a proposal for introducing a Carbon Border Adjustment Mechanism (European Commission, 2021a) that requires importers of certain goods to purchase certificates covering the total embedded emissions, and the International Monetary Fund has proposed the introduction of an international carbon price floor for big emitters (Parry et al, 2021).

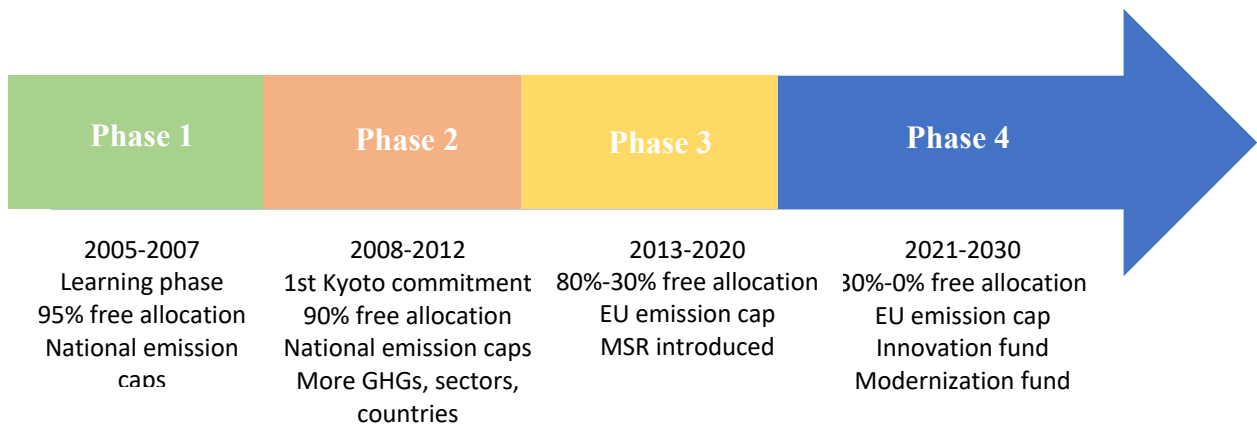
¹ Estimates have been also provided for the social cost of methane and nitrous oxides in 2016 (IWG, 2016).

2. Carbon pricing initiatives in Europe: ETS and carbon taxes

In Europe, ETS schemes and carbon taxes coexist. The EU ETS was launched in 2005 and has just entered its fourth trading period (2021-30). It covers around 43% of the EU's GHG emissions limiting their production for more than 10,400 power and heat plants and manufacturing installations and 350 airlines operating in the European Economic Area (27 member states plus Liechtenstein, Iceland, and Norway). Since 2020, it is linked to the Swiss ETS and, since May 2021, the European Union and the United Kingdom share a Trade and Cooperation Agreement committing to upholding the level of ambition of their climate and environmental policies as at the end of 2020 and adapting them in line with international obligations. In the EU ETS, the European Commission fixes annually a cap on the number of emissions allowances (EUAs-emissions unit allowances- and EUAAs-emissions unit aviation allowances) and the relative shares for each Member State. The last revision of the EU ETS Directive (European Commission, 2021b) established that from the fourth trading period the cap will decrease at an annual rate of 2.2% to meet the emissions reductions foreseen by the Paris Agreement and the EU Green Deal (55% net reduction in GHG emissions by 2030, climate neutrality by 2050).

Each April, installations subject to the EU ETS must return as many emission allowances as the total amount of tCO₂e they have emitted during the year. As it will be described in detail in the next section, within the cap emission allowances can be received for free², bought on an auction, or bought on a secondary market.

² Since the third trading phase, only manufacturing installations can receive free EUAs based on the potential risk of carbon leakage of each sector and emissions performance relative to industry benchmarks. In phase 4, respectively 43% and 75% of EUAs and EUAAs are allocated for free.



The other European ETS mechanism is the UK ETS that started operating in January 2021 following Brexit and, at the moment, is closely following the EU ETS.

In addition to the EU ETS and UK ETS, many European countries implemented carbon taxes initiatives. Finland was the world's first country to introduce a carbon tax in 1990 and, since then, 18 European countries have followed, implementing carbon taxes that range from less than €1 per tCO₂ in Poland (€0.07) and Ukraine (€0.25) to more than €80 per tCO₂ in Sweden (€116.33), Switzerland and Liechtenstein (€85.76).

The scope of each country's carbon tax differs, resulting in varying shares of GHG emissions covered by the tax and varying sectors/industries targeted. Table 1 shows the main characteristics of the carbon taxes implemented in Europe.

Country	Carbon Tax Rate (per tCO ₂ e)	Share of Jurisdiction's Greenhouse Gas Emissions Covered	ETS operators exempted	Year of Implementation
Denmark	Fossil fuels: €24.00 F-gases: €20.17	35%	Partly	1992
Estonia	€ 2.00	6%	Yes	2000
Finland	Transport fuels: €62 Other fossil fuels:€53	36%	No	1990
France	€ 45.00	35%	Yes	2014
Iceland	Fossil fuels: €29.79. F-gases:€16.92	55%	Yes	2010
Ireland	€ 33.50	49%	Partly	2010
Latvia	€ 12.00	3%	Yes	2004
Liechtenstein	€ 85.76	26%	Yes	2008
Luxembourg	Diesel fuel: €34/tCO ₂ e Gasoline: €32/tCO ₂ e All other fossil fuels:€20/tCO ₂ e	65%	No	2021
Netherlands	€ 30.00	12%	Partly	2021
Norway	€ 58.73	66%	Yes	1991
Poland	€ 0.07	4%	Yes	1990
Portugal	€ 24.00	29%	Yes	2015
Slovenia	€ 17.30	50%	Partly	1996
Spain	F-gases: €15	3%	-	2014
Sweden	€ 116.33	40%	Partly	1991
Switzerland	€ 85.76	33%	Yes	2008

Table 1: Carbon taxes in Europe, 2021

Source: Data from “Carbon Pricing Dashboard” by The World Bank, last updated Apr. 1, 2021. https://www.carbonpricingdashboard.worldbank.org/map_data.

3. EU ETS emission allowances: historical volumes and prices

As anticipated, installations subject to the EU ETS can either receive allowances for free (conditional on specific requirements) or buy them on the market. Figure 3 shows the volumes of EUAs freely allocated and auctioned or sold since 2005: the European Commission has been gradually decreasing the number of freely allocated allowances to incentivize emissions reduction.

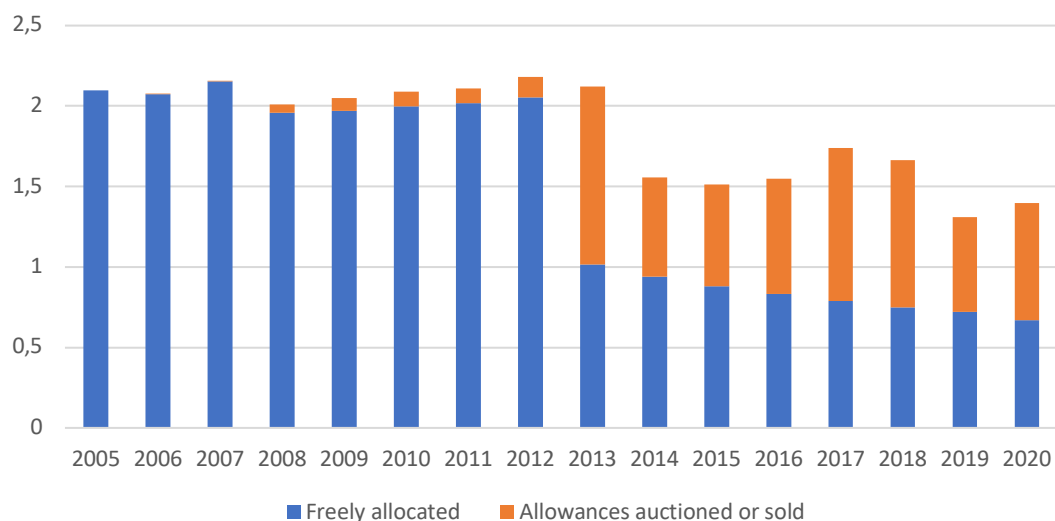


Figure 3: Freely allocated and auctioned allowances in the EU ETS (billions tCO₂e).

Source: Data from “EU Emissions Trading System (ETS) data viewer” by European Environmental Agency, last updated Aug. 5, 2021 (<https://www.eea.europa.eu/data-and-maps/dashboards/emissions-trading-viewer-1>).

The primary market for emission allowances is represented by auctions. According to a calendar fixed by the European Commission, EUAs and EUAs are auctioned on a common transitional auction platform (managed by the European Energy Exchange-EEX), used by 25 Member States, and two opt-out platforms, used by Germany and Poland. Authorized bidders can participate in the auctions (typically 3 per week) specifying the number of allowances and a price for each

bid. The auction format is a single-round, sealed-bid, and uniform-price auction. The clearing price is determined at the end of the bidding windows, and it is the price at which the sum of volumes bid matches or exceeds the volume of allowances auctioned. All bids higher than the clearing price are successful. For each auction, there is a reserve price, i.e. a secret minimum clearing price: if bids are lower than the reserve price or the auctioned volume is not entirely sold, the auction is canceled.

Exchanges and over-the-counter (OTC) transactions represent the secondary market of emission allowances. Allowances can be sold in the form of “spot” contracts, meaning that delivery takes place (almost) immediately, or in the form of derivatives (including futures³, forwards, options, etc.)⁴, which are financial contracts with emission allowances as their underlying assets. Exchanges are based on standardized products (futures and options), provide price transparency, and have a clearing mechanism that reduces counterparty risks. OTC transactions happen directly between the two parties without the supervision of a stock exchange and are based on derivatives (forwards and swaps) that can be customized by participants. Several derivatives exchanges offer standardized emission allowances derivatives contracts: the Intercontinental Exchange (ICE) offers futures and options; the European Energy Exchange (EEX) offers spot, futures, and options; Nasdaq offers EUA futures, including daily futures contracts, quarterly futures contracts for six rolling years and a pre-delivery option for EUA net sellers to fulfill the collateral requirement; CME offers in-delivery month EUA futures and options.

³ In a futures contract, counterparties agree to trade allowances at a certain price on a certain date in the future (the contract’s expiration date). The price is defined on the date at which the futures contract is traded, but the change in ownership of the allowance only occurs after the contract expiration date.

⁴ Trading in allowance derivatives falls under the scope of MiFID and the Market Abuse Directive (IP/14/424).

Table 2 reports the amount of EUAs and EUAAs auctioned, exchanged, and traded OTC in the last four years and shows that trades are mainly concluded via exchanges in the secondary market. When ETS allowances are traded, corresponding adjustments are made on the Union Registry to guarantee accurate accounting.

	2017		2018		2019		2020	
	Mtons	M€	Mtons	M€	Mtons	M€	Mtons	M€
EUAs auctioned	934	5,36	916	14,09	589	14,50	779	19,15
EUAs exchanged	3,83	23,32	5,97	102,39	5,82	145,77	7,31	181,62
EUAs OTC	352	2,18	845	13,74	360	9,12	346	9,02
EUAAAs auctioned	5	34	6	104	6	137	8	179

Table 2: EUAs and EUAAAs traded by segment (excluding options market)

Source: From “Carbon Market Year in Review 2020” by Refinitiv, 2021.

In the EU ETS, the prices of emission allowances are influenced by several supply and demand factors, the structure and regulations of the carbon pricing system itself, and long-term policy expectations of market players. Supply factors include the total allocation of allowances to the EU ETS participants, e.g., higher amounts of free allocations lead to fewer allowances to be purchased and, thus, lower prices. Demand factors include macroeconomic conditions, energy prices, renewable energy generation, and weather conditions. A stronger economy usually results in higher allowances prices – as industrial production increases, associated carbon emissions rise, thus more carbon allowances are needed by operators to cover their emissions. An increase in energy prices or an increase in renewable energy generation, instead, is expected to lead to a fall in prices as it incentivizes firms to switch to cheaper energy sources or reduce emissions. Carbon prices are also affected by unexpected weather conditions: extreme temperature events, as cold winters, increase the need for, carbon emissions eventually leading to an increase in the

price of allowances. Regarding the influence of the EU ETS structure and regulations, new rules - e.g., imposing higher GHG targets, including new sectors, or the intervention of the MSR - influence prices from both demand and supply sides following mechanisms similar to the ones just described. Finally, the carbon price in the secondary market is very sensitive to participants' expectations of future legislative changes.

Figure 4 shows the trend in EUAs' daily spot prices (see Section 5 for analysis and comparison among spot, future, and auction prices time-series). The price of allowances has suffered major variations since its very first phases. After an initial increase in prices due to the stricter caps set at the beginning of the second trading period (2008-2013), allowances prices fell rapidly from mid-2008 due to the global financial crisis. Followed years of price stagnation (with an exceptional increase in 2011 due to the decision to shut down all nuclear plants for maintenance in Germany that led to a rise in demand for fossil fuels) because of overallocation, the development of renewables, and an increase of energy efficiency. At the beginning of the new trading phase in 2013, the EU ETS had accumulated a surplus of about 2 billion allowances and prices reached an all-time low of around €2/tCO₂e. This led the European Union policymakers to initiate a series of reforms that resulted in an amendment of the EU ETS directive in 2018. Among the main changes was the introduction of the Market Stability Reserve (MSR), a price control mechanism that alters auction volumes when the total number of allowances in circulation is above or below predefined triggers, which operated for the first time in 2019. This provoked a rapid increase in prices that was halted only in the first quarter of 2020 because of the effects of the Covid-19 pandemic. Since May 2020 prices recovered and, during the last year, have been growing at an unprecedented trend. The main causes have been the expected tightening of rules and fewer free allocations of the incoming fourth phase of the EU ETS, higher energy demand due to

cold weather, and the increased interest from financial investors that followed the announcement of the new European Green Deal in July 2021. The most recent peaks in prices seem, instead, to be attributable to the record global prices of gas⁵ and the new European Commission’s announcements regarding the “Fit for 55” package (Box 1) of legislative proposals.



Figure 4: Time-series of EUAs spot nominal daily prices in euro.

Source: Data on EUAs spot prices from “Allowance price explorer” by ICAP, last updated 01/12/2021. Spot prices are provided by EEX.

⁵ A Commission’s communication (13 October 202) demonstrates that the effect of the gas price increase on the electricity price is nine times bigger than the effect of the carbon price increase.

Box 1 – “Fit for 55” (European Commission, 2021b)

The “Fit for 55” package proposes a significant revision of the EU ETS. In particular:

- Increase in the EUAs annual rate of reduction from 2.2% to 4.2%
- A separate ETS for buildings and road transport and expansion of current ETS to certain maritime emissions
- Gradual introduction of a carbon border adjustment mechanism (CBAM) starting in 2023 for imports to avoid “carbon leakage” in the affected cement, aluminum, steel and iron, fertilizers, and certain power sectors

To be accompanied by the following measures:

- 55% reduction of emissions from cars by 2030 and 100% emission reduction for new cars by 2035
- Increase of the renewable energy target from 32% to a 40% share
- New 2030 energy efficiency targets of 36% for final and 39% for primary energy consumption
- Implementation of a new energy taxation principle
- Minimum tax rates for motor and heating fuels and electricity
- Climate neutrality for land use, forestry, and the agriculture sector by 2035

4. Carbon credits in the EU

As anticipated, carbon credits represent another carbon pricing mechanism. Carbon credits are financial instruments that should represent a tonne of GHGs removed or reduced from the atmosphere as a result of an emissions reduction project. Carbon offset projects can be produced by various activities, such as reforestation and afforestation, renewable energy development, energy efficiency improvements, clean cookstove distribution, the greening of transportation, the capture and destruction of high-potency GHGs, and carbon capture and storage.

In Europe, carbon crediting initiatives have concerned both regulated and voluntary markets. The main regulated market originates from the Kyoto protocol (Box 2). Indeed, from the first EU-ETS trading period, a link was established between the EU ETS and two Kyoto

flexible carbon crediting mechanisms, namely the “Clean Development Mechanism” (CDM) and the “Joint Implementation”(JI). Participants in the EU ETS could use international credits from these two mechanisms⁶ towards fulfilling part of their emissions reduction obligation. Over the years, tighter limits were imposed on the use of offsets both in terms of quantity and quality in order to safeguard the environmental integrity of the EU ETS system, reduce over-supply, and incentivize domestic emissions reductions. In particular, from 2013 the total use of credits was capped at 50% of the overall reduction of phase 2 and phase 3, newly generated (post-2012) international credits had to originate from projects in the least developed countries, and credits were not to be surrendered directly but exchanged for EU ETS allowances. The Kyoto Protocol and its mechanisms expired at the end of 2020 and the last review of the EU ETS Directive (European Commission, 2021b) established that international credits may no longer be used for EU ETS compliance.

Box 2 – Carbon offset markets of the Kyoto Protocol

Joint Implementation projects (JI): defined by Article 6 of the Kyoto Protocol, allows a country with an emission reduction or limitation commitment under the Kyoto Protocol (Annex B Party) to earn emission reduction units (ERUs) from an emission-reduction or emission removal project *in another Annex B Party*.

Clean Development Mechanism (CDM): defined by Article 12, allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol (Annex B Party) to earn certified emission reductions (CERs) from an emission-reduction project in developing countries.

At the most recent COP26 meeting in Glasgow, a “Paris Rulebook” has been finalized that includes a set of accounting rules and guidelines regarding new carbon crediting mechanisms that will replace the

⁶ Exemptions to the accepted carbon credits are those related to nuclear energy projects; afforestation or reforestation activities; projects involving the destruction of industrial gases.

CDM and JI under the Paris Agreement article 6. After long negotiations, member states agreed also to carry forward CERs created under the CDM if registered after 2013 (approximately 100 million). This last decision has been criticized as many argue that too many CERs will drive down the price of credits and provide an easy way for countries to meet their emissions targets without reducing emissions effectively.

The total volume of international credits traded in the EU ETS amounts approximately to 1.57 billion. Table 3 details the volumes of CERs and ERUs international credits surrendered during EU ETS phase 2 and phase 3.

	Certified Emissions Reductions	Emissions Reduction Units
	Phase 2 (2008-12)	Phase 3 (2013-20)
Stationary installations	1047.94	498.42
Aviation operators	10.96	7.93
TOTAL	1058.9	506.35

Table 3: Summary of international credits surrendered in phase 2 (2008-12) and exchanged in phase 3 (2013-20) by types of operators (in millions).

Source: From “Report on the Functioning of the European Carbon Market in 2020” by European Commission 2021c.

CERs prices have undergone the same trend as EUAs for a long time (see Figure 5). Like EUAs, CERs prices made a free fall after the crisis but they did recover afterward. Indeed, in 2011 it became clear that CERs could only be used to a limited extent in phase 3 (2013-2020) of the EU ETS. Because the EU ETS was the largest buyer of CERs, this led to a large surplus, causing prices to fall well below €1 (€0.37 on the last day of 2020).

The voluntary carbon credits market developed parallelly with the compliance markets. It operates outside regulated schemes and allows various agents –businesses, governments, non-profit organizations, universities, municipalities, and individuals–

purchasing carbon credits voluntarily. The voluntary carbon market includes a wide range of programs, protocols, and standards. Internationally, the main carbon offset programs are Gold Standard, Plan Vivo, and Verra (VCS program). While they share many criteria of the project approval process, each program has different requirements for project validation, verification, and monitoring. These carbon credit programs use carbon offset registries to record each project and the associated credits and remove them when bought to avoid double counting and preventing the credit from being resold. Currently, there are several existing registries, but the World Bank is proposing an internationally unified registry.



Figure 5: EUAs futures and CERs nominal prices in euro.

Source: Data on EUAs spot prices from “Allowance price explorer” by ICAP, last updated 01/12/2021 (spot prices source is EEX). Data on CERs prices from Factor ideas integral services (<https://www.wearefactor.com/it/prezzi-della-co2/2021>).

Most voluntary carbon credits are purchased directly from project developers (OTC) and for this reason information on selling volumes

and prices are hard to find. Most of the available information comes from trades made through brokers, an exchange (like ICE), or retailers. The voluntary market has experienced dramatic growth in the last biennium. Traded volumes hit a record of 239.3 MtCO₂e in the first eight months of 2021. Issuance reached 238.5 MtCO₂e, but the number of retirements fell at 96.7 MtCO₂e resulting in a large surplus of voluntary credits (see Figure 6). As displayed in Table 4, the volume growth has been driven by forestation and land-use projects, but also agricultural and transportation projects have registered an important increase. Most projects come from Asia (56%) and Africa (22%): credits from European projects represent less than 1% of the global voluntary carbon credit transacted.

The price of carbon credits depends on the type of carbon offset project, the carbon standard under which it was certified, the size and location of the project, the co-benefits associated with the project, and the vintage year of carbon sequestration or removal. Table 4 reports the average prices for the different categories of projects: prices range from €5.12 for household devices to €0.89 for transportation projects.

Overall, the most recent voluntary carbon market prices are low (the global average price is €2.85 per tCO₂) and this is mainly due to the excess supply of the market.

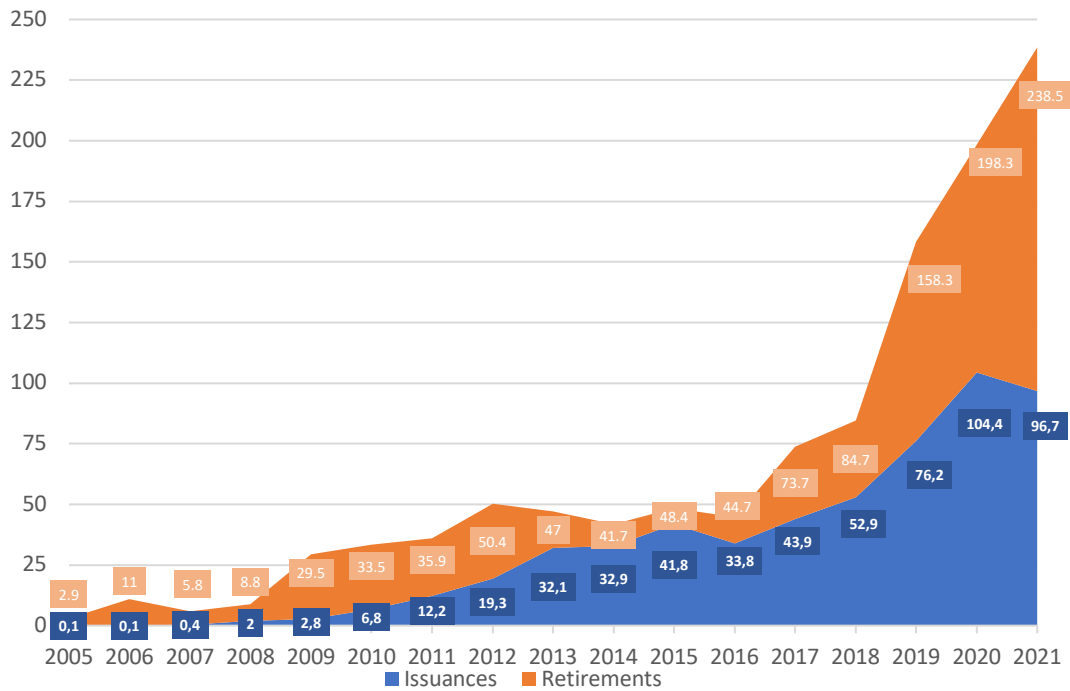


Figure 6: Market Size by Voluntary Carbon Offset Issuances and Retirements, 2004 to 31 August 2021.

Source: Adapted from “State of the Voluntary Carbon Markets 2021” by Ecosystem Marketplace, 2021.

Type of project	2019		2020		2021	
	Volumes (MtCO2e)	Prices (Euro)	Volumes (MtCO2e)	Prices (Euro)	Volumes (MtCO2e)	Prices (Euro)
Forestry and land use	36.70	3.83	48.10	4.98	115.00	4.21
Renewable energy	42.40	1.25	80.30	0.77	80.00	0.98
Energy efficiency/ Fuel switching	3.10	3.47	31.40	0.92	16.10	1.40
Agriculture	-	-	0.30	8.21	3.40	1.21
Waste disposal	7.30	2.23	8.30	2.46	2.70	3.50
Transportation	0.40	1.51	1.10	0.57	2.10	0.89
Household devices	6.40	3.38	3.50	4.41	1.80	5.12
Chemical processes/ Industrial manufacturing	4.10	1.69	1.30	1.69	1.10	2.87

Table 4: Transacted voluntary carbon offset volume and weighted average price by type of project, 2019-Aug.2021.

Source: Adapted from “State of the Voluntary Carbon Markets 2021” by Ecosystem Marketplace, 2021.

5. Carbon prices for the WeCareMed project

The objective of WeCareMed is the development of a tool that provides the carbon footprint of Interreg MED projects in physical and monetary terms. To this aim, CRIEP contributes by identifying the price that can be used to estimate the monetary value of carbon emissions.

As the geographical coverage of the Interreg MED program includes only European countries bordering the Mediterranean Sea, ***the first recommendation of this report is to focus on European carbon markets.***

The review on existing EU carbon pricing initiatives presented above revealed that three potential carbon prices could be considered for valuing Interreg MED carbon emissions, namely the prices of EU ETS allowances (EUAs), the prices of regulated carbon credits (CERs), the prices of voluntary carbon credits (VERs). However, as described above, EUAs, CERs, and VERs price differentials are remarkable. Setting aside CERs because of their uncertain future, VERs prices are currently very low and far from the estimated social cost of carbon figures needed to reach 2050 carbon neutrality. Even though VERs price levels are expected to increase as a result of the new developments of the Paris Agreement and European Green Deal, ***this report recommends using the price of EU ETS allowances as a reference for the estimation of the carbon footprint monetary value.*** Indeed, the EU ETS is a credible and consolidated carbon pricing mechanism and its close link to international and European climatic and environmental policies makes it the best alternative.

The following sub-section is dedicated to:

- i. investigate the time-series of EUAs auction, spot, and future prices and identify which one is best for benchmarking;
- ii. define the time frame of the series that should be considered for the estimation;

- iii. define the frequency with which prices will need to be updated by the WeCareMed tool.

5.1 Analysis of the time-series of EUAs spot, future, and auction prices

Figure 7 displays the time-series of EUAs auction clearing prices and EUAs spot and future daily prices. It is easy to see that primary market prices are closely aligned with secondary market prices: once plotted, the three time-series are almost entirely overlapping. Furthermore, it can be observed that they exhibit violent fluctuations across all the periods considered from prices as low as €2.68 on 17th April 2013 to €72.89 on 30th November 2021.

To further investigate this visual evidence, a sample dataset is considered that includes all the instances in which daily prices were registered for all three series (1,811 observations). The period considered ranges, thus, from 7 January 2013 to 23 November 2021. Furthermore, to analyze volatility more closely, returns are calculated as the difference between the logarithm of prices at time t and $t-1$. Figure 7 displays EUAs spot, future, and auction returns, and Table 5 presents descriptive statistics for the price and returns time-series.



Figure 7: EUAs spot, future, and auction prices.

Source: EUAs auction prices are available three times per week, EUAs spot and future prices are daily. Data on EUAs auction prices from “Emission Spot Primary Market Auction Report 2021” by EEX., Data on EUAs spot prices from “Allowance price explorer” by ICAP, last updated 01/12/2021 (spot prices source is EEX). Data on future prices from Factor ideas integral services (<https://www.wearefactor.com/it/prezzi-della-co2/2021>).

As shown in the last row of the table, the Pearson correlation coefficient is significantly higher than 0.9 for each pair for time-series, indicating strong co-movements in response to new common information. Minimum and maximum values reveal that the changing range of daily EUAs prices is large. Moreover, the huge intraday losses of the EUAs markets are obvious, with maximum losses of 44.66% in the EUA spot market, 43.21% in the future market, and 52.96% in the auction market. The coefficients of skewness and kurtosis indicate fat-tailed and leptokurtic price distributions which suggest that extremely high or low changes in prices are more likely to occur than they would in the case of a normal distribution. Revenues are also negatively skewed which is attributed to the risk associated with high prices. Jarque–Brera test results suggest that the hypothesis of a normal distribution can be rejected at any significance

level, which is consistent with most prior studies (Chevallier, 2010; Kalantzis and Milonas, 2013; Uddin et al, 2018; Viteva et al., 2014).

	EUAs Spot		EUAs Future		EUAs Auction	
	Prices	Returns	Prices	Returns	Prices	Returns
Average	16.48	0.00	16.52	0.00	16.41	0.00
Median	7.89	0.00	7.92	0.00	7.89	0.00
Minimum	2.83	-0.45	2.89	-0.43	2.75	-0.53
Maximum	72.89	0.21	72.91	0.24	69.88	0.24
St. dev.	15.27	0.04	15.29	0.04	15.23	0.04
Skewness	1.531	-1.257	1.530	-1.144	1.530	-1.521
Kurtosis	1.668	17.301	1.665	16.105	1.655	25.417
Jarque- Brera	916.94	23049.17	915.58	19954.74	913.49	49417.08
$\rho_{S,F} = 0.9999$ $\rho_{S,A} = 0.9995$ $\rho_{F,A} = 0.9995$						

Table 5: Descriptive statistics of EUAs spot, future, and auction prices and returns time series. **Source:** Data on EUAs auction prices from “Emission Spot Primary Market Auction Report 2021” by EEX. Data on EUAs spot prices from “Allowance price explorer” by ICAP, last updated 01/12/2021 (spot prices source is EEX). Data on future prices from Factor ideas integral services, accessed 01/12/2021 (<https://www.wearefactor.com/it/prezzi-della-co2/2021>).

Moreover, the plots of returns time-series show that fluctuations exhibit volatility clustering i.e., returns conditional variance strongly depends on previous price performance. This suggests that factors, such as weather conditions, changes to market structure, macroeconomic trends, etc. have an important role in determining price changes.

In light of this analysis, **this report recommends using the daily closing prices on EUAs spot contracts as the reference time-series of prices for the valuation of Interreg MED carbon emissions** (accessible on the EEX website - <https://www.eex.com/en/market-data/environmental-markets/spot-market>). Indeed, while being very close to future and auction prices, EUAs spot prices more closely reflect the current market trends than the former and are more frequent than the latter, thus representing the best price option.

Furthermore, given the complex fluctuations of the series, the unprecedented increasing trend of the last biennium, and the very large number of potential price drivers, forecasting is not recommended for the purpose of the WeCareMed project. For this reason, pricing should be based on observed historical prices: ***this report recommends using as carbon price the simple average of EUAs spot daily prices over the last 2 months available.*** This allows smoothing out price trends by filtering out the “noise” from random short-term price fluctuations (see Figure 8).

Finally, ***this report suggests reviewing the pricing approach after three years*** to check the development of prices and evaluate whether seasonality of some kind can be observed, and prices can be more easily forecasted.

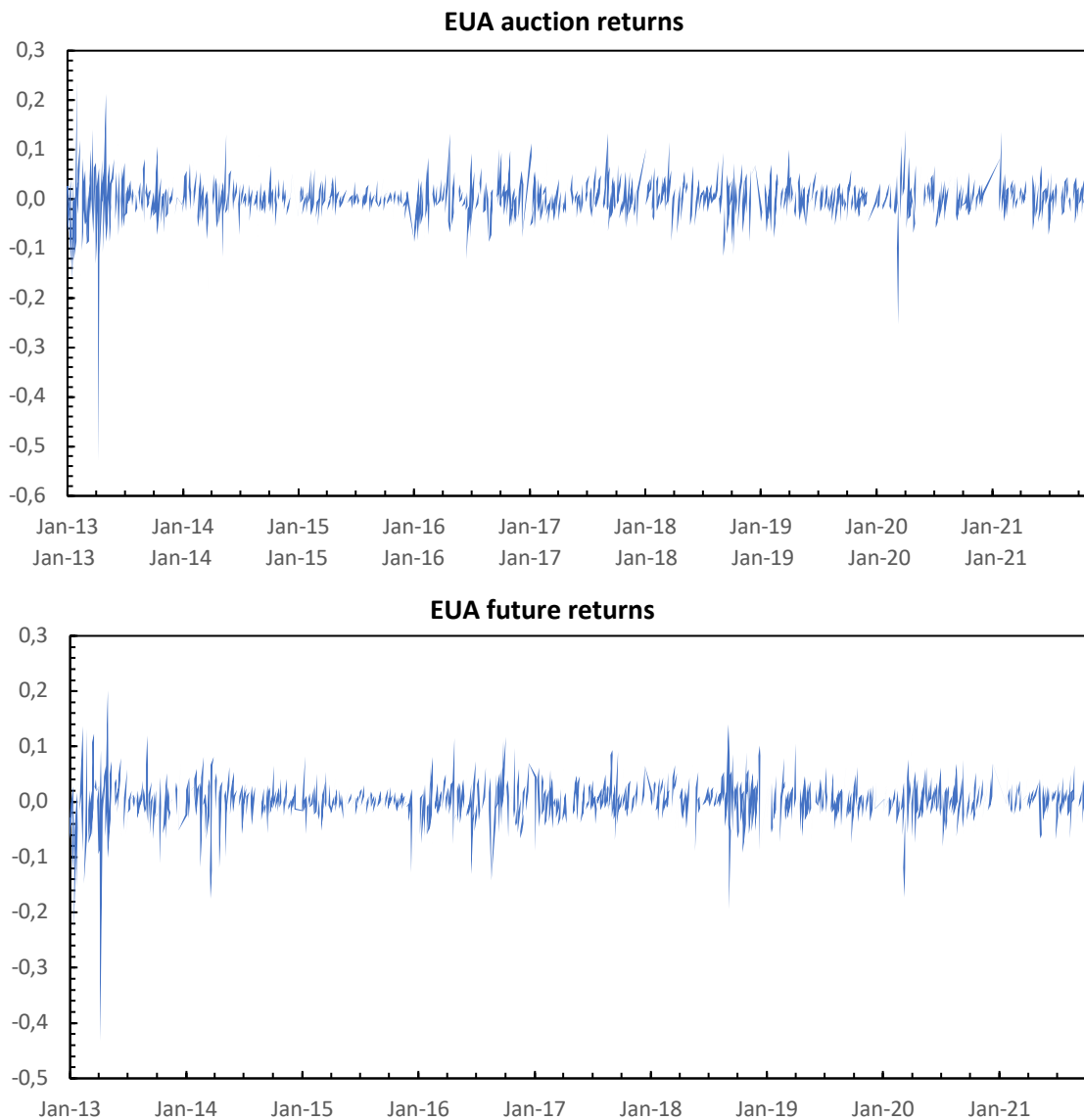


Figure 7: Time-series of EUA spot, future, and auction clearing price returns.

Source: Data on EUAs auction prices from “Emission Spot Primary Market Auction Report 2021” by EEX. Data on EUAs spot prices from “Allowance price explorer” by ICAP, last updated 01/12/2021 (spot prices source is EEX). Data on future prices from Factor ideas integral services, accessed 01/12/2021 (<https://www.wearefactor.com/it/prezzi-della-co2/2021>).

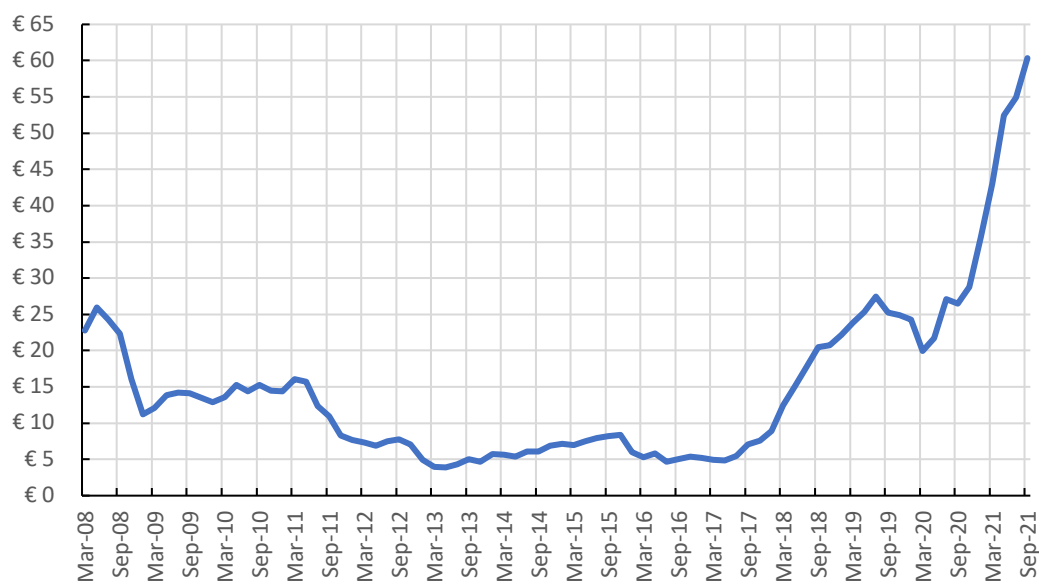


Figure 8: Two-months average of daily closing prices on EU ETS allowances spot contracts.
Source: Data on EUAs spot prices from “Allowance price explorer” by ICAP, last updated 01/12/2021 (spot prices source is EEX).

5.1.1 Additional notes

If the funds to be set aside by each applicant for compensation purposes are evaluated based on a carbon footprint estimated in the application phase, this report recommends updating carbon prices before the opening of each Interreg MED call and keeping them constant throughout the entire application window. In this way, all applicants will be able to observe the same carbon price at all times.

If the funds to be set aside by each applicant for compensation purposes are evaluated based on the actual carbon footprint calculated at the end of each project term, this report recommends updating carbon prices at the moment of the final reporting.

If a comparison between estimated and actual carbon footprint is made, this report recommends using both times the carbon price employed in the application phase. This allows an objective comparison between the estimated and actual carbon emissions avoiding distortions due to price changes.

6. Summary list of CRIEP's recommendations

- 1) Focus on European carbon markets
- 2) Use the price of EU ETS allowances as a reference for the monetary value estimation
- 3) Use the daily closing prices on EUAs spot contracts as the reference time-series of prices for the valuation of Interreg MED carbon emissions
- 4) Calculate and use a simple average of EUAs spot daily prices over intervals of 2 months.
- 5) Review the pricing approach after three years

B. Understanding Carbon Offsetting

1. Introduction to carbon offset projects and carbon credits

The term carbon offset broadly refers to a net reduction or removal of greenhouse gases (GHG) emissions that is made to compensate for emissions that occurred elsewhere. Individuals, businesses, and institutions can offset the residual GHG emissions they were unable to reduce by purchasing carbon offset credits (or carbon credits). A carbon credit is a transferrable instrument certified by governments or independent certification bodies to represent a reduction or removal of one tonne of carbon dioxide equivalent (tCO₂e) from the atmosphere. The purchaser of a carbon credit can “retire” it to claim the underlying reduction.

Carbon offsetting is a relevant instrument to reach the Paris Agreement’s objective of restricting the increase in the global average temperature to well below 2°C above pre-industrial levels. Even though many countries pledged to follow reduction pathways towards net-zero, they will not be able to avoid or reduce some of their emissions, i.e., emissions residuals, that will have to be removed through offsetting.

As GHG mix globally in the atmosphere, it does not matter if the removal or the reduction is made in a different geographical location from where the emission is produced: from a climate change standpoint, the same effect is registered by the termination of an emission-causing activity or by an equivalent reduction in emissions made by an activity located somewhere else in the world. For this reason, the vast majority of offset projects are hosted in developing countries where operating costs are smaller and the positive environmental and socio-economic impacts generated by offset projects are larger.

There are two types of carbon compensation, namely reductions or removals. The former aim at reducing or avoiding GHG emissions compared to a baseline scenario, for example through energy efficiency, renewable energy, or forestation projects. The latter aim at removing GHG emissions by absorbing or capturing the CO₂e, for example through forest management, changes in land use, improved agricultural practices, or technological removal projects.

Offset projects can be divided into categories and types (see Table 1) and can have a small (hundred tCO₂e removed/reduced per year) to a large (millions of tCO₂e removed/reduced per year) scale. It is often the case that carbon offset projects produce social and environmental benefits beyond GHGs reductions or removals. Depending on the project type, these co-benefits can include community employment opportunities, enhanced air or water quality, biodiversity and habitat conservation, improved energy access, and better access to community health and education services.

Box 1 – REDD+ projects

REDD+ (Reducing Emissions from Deforestation and forest Degradation) are projects that aim to contribute to the fight against climate change by preserving forests in specific areas that are considered at risk of deforestation. The plus in the acronym indicates the co-benefits offered by these projects, which may help, for instance, to improve the living conditions of the local population, increase water quality, or preserve biodiversity. They were developed in line with the UN-REDD program launched in 2008 by the United Nations. Carbon credits issued over REDD+ projects are often under scrutiny because there is no way of calculating with certainty the GHG emissions avoided due to the avoided deforestation and, thus, to guarantee that the number of carbon credits issued by a REDD+ project really corresponds to its mitigation impact.

Project category	Project type
Agriculture	Fertilizer - N2O Grassland/rangeland management Livestock methane No-till/low-till agriculture Rice cultivation/management Sustainable agricultural land management Other - Agriculture
Chemical Processes/ Industrial Manufacturing	Nitric Acid Ozone-depleting substances (Article 5) Ozone-depleting substances (US-based) Carbon capture and storage Coal mine methane Other - Chemical Processes/Industrial Manufacturing
Energy Efficiency/ Fuel Switching	Energy efficiency - community-focused (targeting individuals, communities, etc.) Energy efficiency - industrial-focused (targeting corporations) Fuel switching Waste heat recovery
Forestry and Land Use	Afforestation/reforestation Agro-forestry Avoided conversion Improved forest management REDD - Avoided planned deforestation (Box 1) REDD - Avoided unplanned deforestation (Box 1) Soil carbon Urban forestry Wetland restoration/management
Household Devices	Household Devices Clean cookstove distribution Water purification device distribution Other - Household Devices
Renewable Energy	Biogas Biomass/biochar Geothermal Large hydro Run-of-river h Solar Wind
Transportation	Transportation - private (cars/trucks) Transportation - public (bikes/public transit) Other - Transportation
Waste Disposal	Landfill methane Waste water methane

Table 6: Offset project categories and types.

Note: From “Carbon Offset Project Types and Categories” (2018) by Ecosystem Marketplace.

2. Carbon offset programs

To provide quality assurance on projects and credits, several carbon offset programs exist. They perform three basic functions:

- i. Develop and approve standards that set criteria and protocols for the quality of carbon credits;
- ii. Review and monitor offset projects against these standards (occasionally with the help of third-party verifiers);
- iii. Operate registry systems that issue, transfer, and retire offset credits.

Carbon offset programs differ from each other in three main respects. The first is the type of entity administering them: offset programs can be either administered by governmental or intergovernmental entities or by private and independent non-governmental organizations that are often non-profit. The second is their purpose: they can be instituted to allow participants to buy carbon credits to comply with mandatory emissions caps defined by national or international climate policies (compliance programs) or they can be intended for enabling companies, individuals, and institutions to reach voluntary emissions reduction goals independently from any legal requirement but in line with global climate objectives (voluntary programs). The third is the type of standards employed: very different sets of criteria and protocols have been developed over the years, ranging from those limited in scope, such as compliance to the International Organization for Standardization (ISO) standard 14064-2 (see Box 2), to complete ones with rules, requirements, and administrative systems for accounting, quantifying, monitoring, reporting, verifying, certifying, and registering offset projects and credits.

Box 2 – ISO 14064

The international technical standardization body (ISO) has developed a standard ISO 14064 which provides a framework for quantifying, accounting for, and verifying organizations' GHG emission reductions. The ISO 14064 standard is a family of three standards (which can be used separately):

- ISO 14064-1: Specifies the principles and organization-wide requirements for quantifying and reporting GHG emissions and their reduction. It covers the design, development, management, reporting, and verification of an organization's GHG inventory.
- ISO 14064-2: Specifies principles and requirements and provides project-level guidance for quantifying, monitoring, and reporting activities to reduce or eliminate GHG emissions.
- ISO 14064-3: Specifies principles and requirements and guides those who conduct or manage the validation and/or verification of GHG emission reports.

Hitherto, the first and largest international offset program has been the Clean Development Mechanism (CDM) administered by the United Nations Framework Convention on Climate Change (UNFCCC) and created under the Kyoto Protocol. The CDM was a compliance program that offered countries and sectors participating in the Kyoto Protocol the opportunity to purchase international carbon credits, called Certified Emission Reductions (CERs), from offset projects in developing countries to meet their emission reduction targets. Thanks to the “linking directive”, CERs could also be used under the EU Emission Trading System (ETS). Operational since 2006, the CDM registered globally more than 7,849 projects and produced CERs amounting to more than 2.1 billion tCO₂e, most of which traded in the European Union (EU).

The Kyoto Protocol also established a second and minor compliance program called Joint Implementation (JI). Unlike CDM, JI allowed member states to invest in projects based in other developed (Annex I) countries. The tradable units from JI projects were called Emissions Reductions Units (ERUs). The CDM and the JI were the first two programs to propose a set of rigorous rules and protocols for the

certification of offset projects, which included third-party verification and monitoring (see in Box 3 details on their project approval cycle). When the Kyoto Protocol reached the end of its first commitment period in December 2012, CERs and ERUs could still be traded under the Paris Agreement and in the EU ETS, but with some qualitative and quantitative restrictions. However, the most recent European Commission proposal (European Commission, 2021) established that CDM and JI credits can no longer be used to fulfill emission reduction targets under the EU ETS mechanism.

A new international compliance offset program trading is being developed under Article 6 of the Paris Agreement. In particular, Article 6.4 sets out a framework behind the creation of a new compliance carbon offset program managed by the UNCFPP that will replace the CDM. This new program will credit Emission Reductions (ER) that countries can use to reach their nationally determined contributions (NDC), i.e., national climate action plans to cut GHG emissions and adapt to climate impacts. The “Paris Rulebook”, negotiated and finalized at COP26 in Glasgow, provides the accounting rules and defines the functioning of the crediting mechanism behind article 6.4 (UNFCCC, 2021). The main point of criticism on the approved “Paris Rulebook” regards the decision to carry forward CERs created under the CDM if registered after 2013 (approximately 100 million) as many argue that too many CERs will drive down the price of credits and provide an easy way for countries to meet their NDC without reducing emissions effectively.

Box 3: Project approval cycle

The approval process typically consists of three phases:

- i. Validation, to check the eligibility of the project according to some pre-defined criteria.
- ii. Verification and monitoring, to quantify emissions removals or reductions, confirm, and monitor them (with the aid of a third party) over a certain period.
- iii. Issuance and registration, to track information regarding the ownership of the carbon credit and avoid double counting.

Besides the intergovernmental compliance programs just described and a few other governmental compliance programs (e.g., California compliance offset program, Australia ERF, the China GHG Voluntary Emission Reduction Program), a wide range of voluntary programs developed globally, each with their independent administration entity, standards, and “branded” carbon credits. Large volumes of carbon credits have been traded in voluntary markets since 2016, but traded volumes hit a record of 239.3 MtCO₂e in the first eight months of 2021. Some international and national voluntary programs have gained credibility over the years thanks to the rigorous standards they developed, often inspired by the CDM and JI ones, and are advocating for their formal recognition as valuable complements to Paris-aligned reduction pathways.

2.1 CORSIA

The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) is a compliance carbon offset and carbon reduction scheme to lower CO₂ emissions for international flights and reduce the overall aviation impact on climate change. It was developed by the International Civil Aviation Organization (ICAO) in 2016 and asked countries to purchase/retire carbon credits to stabilize their international aviation sector's GHG net emissions at the 2019-2020 level. In November 2021, the ICAO defined the offset programs and type of projects that are eligible for CORSIA (ICAO, 2021) and this has stimulated the creation of standardized contracts for CORSIA-eligible credits, like CBL's Global Emission Offset, S&P Global Platts' CORSIA-eligible credit, and AirCarbon CORSIA-Eligible Tokens.

As of September 2021, 107 countries worldwide pledged to join CORSIA from 1st January 2021, with some key exceptions (China, India, Russia, and Brazil). In the European Union, appropriate amendments are being considered in the EU ETS to implement CORSIA consistently with the EU's 2030 climate objectives, and to increase the share of allowances auctioned under the system for aircraft operators (European Commission, 2021).

CORSIA was expected to create demand for around 3 GtCO₂ in the period between 2021 and 2035, making the aviation sector likely the largest source of demand for international carbon credits. However, the recent ICAO decision, which followed the Covid-19 pandemic, to use 2019 as the baseline for the pilot phase (2021-23) and the reduction of air travel due to the health crises have curbed CORSIA demand for carbon offsets.

3. Carbon offset projects in the MED area

As anticipated above, most offsetting projects are hosted in developing countries because of the lower implementation costs and the many and varied co-benefits that they produce in addition to the climatic ones. The few offset projects hosted in EU member states have been certified by voluntary carbon offset programs, which are either international or European. For what international programs, the two major programs that register and certify offset projects in the EU are The Gold Standard and Verra. They have developed complete standards with ad-hoc registries in line with the CDM ones, and issue verified emissions reduction (VER) and verified carbon units (VCU) carbon credits, respectively. The main difference between them is that the former has a stronger focus on co-benefits that progress the United Nation's Sustainable Development Goals (SDGs) than the latter. See Table 2 on the main characteristics of The Gold Standard and Verra programs. As of December 2021, only 5 projects hosted in the EU have been registered by these two programs.

Program	Foundat. year	Standard	External Auditors	Carbon Credit	Geographical Coverage
The Gold Standard	2003	The Gold Standard	Designated Operational Entities (Box 4)	VER	International
Verra	2007	Verified Carbon Standard	Accredited VCS auditors	VCU	International

Table 7: Main characteristics of The Gold Standard and Verra programs.

For what concerns European programs, the two main offset programs are based in Spain and are managed by the Spanish Government. In particular, the Spanish Ministry for Ecological Transition and Demographic Challenge manages a national voluntary registry of carbon emissions and offset projects. Spanish companies not covered by the EU ETS can report their annual level of emissions and invest in the registered offset projects. Specific rules are set for offset projects that can only belong to the reforestation or afforestation type. As of December 2021, 149 projects have been registered for this program. Since 2011, the Spanish Government is also in charge of the Carbon Fund for a Sustainable Economy (FES-CO₂), a national mechanism that supports domestic offset projects (forestation projects, carbon sinks projects, and energy innovation projects) based in Spain. Projects that apply to the Carbon Fund must first pass a valuation phase and then, once selected, are monitored in their emissions reduction by a third-party validator. Conditional on verification, the carbon credits they generate are purchased by the Spanish Government.

The other voluntary offset program operating in the EU is the one managed by CE.SI.SP (Inter-University Centre for Product Sustainability Development). CE.Si.S.P. is a university facility working in the field of applied research on reducing GHG impacts and on product sustainability. Offset projects are validated by third-party auditors based on their conformity to ISO14064-2 and credits are issued and kept on an independent registry (Eco2Care). As of December 2021, this program has registered 12 projects of different categories, and all located in Italy.

The in-depth survey on carbon offsetting conducted in preparation for this report did not reveal any other offset program that certifies projects located in the EU.

Box 4 - Accredited external validators

A designated operational entity (DOE) is an independent auditor accredited by the CDM Executive Board (CDM EB) to validate project proposals or verify whether implemented projects have achieved planned greenhouse gas emission reductions. The last updated list of the 69 accredited DOEs is available at the following link: <https://cdm.unfccc.int/DOE/list/index.html>.

DOEs are used by The Gold Standard program to get independent third-party validation and verification assessments (the same DOE cannot be used for both validation and verification). Verra validators are, instead, accredited by the Verra Board itself and can carry out both validation and verification for the same project.

4. Carbon credits purchasing options

The purchase of carbon credits can be made at different stages of the project's "lifecycle" and with various arrangements:

1. Over-the-counter, by negotiating directly with the project developer. This can be done either before the start and the validation of the project (through a contract called "Emission Reduction Purchase Agreements"), or once the relative carbon credits are issued and registered;
2. On a trade exchange;
3. Via a broker. Brokers procure offset credits and then transfer (or retire) them on clients' behalf. Brokers can make it easier to identify a mix of offset credits from different project types and facilitate large or small transactions. Some brokers sell offset credits from projects they have invested in, in addition to projects developed by others;
4. Via a retailer. Retailers can provide access to offset credits from a range of different projects thanks to their account on carbon offset program registries and they can retire credits directly on the purchaser's behalf.

It should be noted that the volumes of voluntary carbon credits traded on an exchange are very limited. Most voluntary carbon credits transactions occur over-the-counter (making it hard to obtain information on market prices).

For buyers looking to acquire only a small number of credits (e.g., small companies or individuals), the most feasible option for purchasing offset credits is often to go through a retailer. For buyers looking to acquire large volumes of credits, the most feasible options are either opening an account in the registry of one carbon offset program, which typically requires an annual fee of around \$500, or purchasing them through a broker.

5 Main issues connected with carbon offsetting

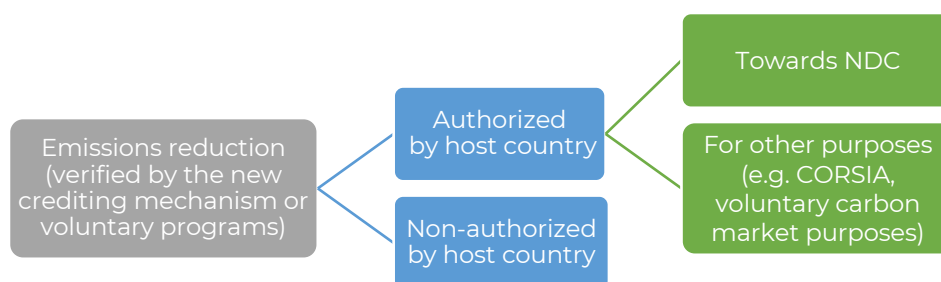
5.1. Double Counting

Double counting is a risk that occurs when a country selling a carbon credit claims the underlying emissions reduction for itself, while at the same time the country buying the credit also claims the same emissions reduction.

Under the Kyoto Protocol, double-counting was less of an issue because the number of countries with emission targets was small, and offset projects were either made in developing countries without commitment to reduce emissions or through a registered exchange of emission units. In the Paris Agreement era, the risk of double-counting raised because the number of countries that pledged emission reduction targets globally is 190.

As anticipated, the recent “Paris Rulebook” on Article 6 developed at COP26 provides accounting rules and guidance on trades between countries committed to climate targets. In particular, it makes clear that the country where the ER is generated must remove this ER from its overall emissions budget (corresponding adjustment) if another

country uses it to reach its NDC. However, the “Paris Rulebook”, with reference to Article 6.4, specifies that the corresponding adjustment is required only if the host country authorizes an ER to be used towards (a) an NDC or (b) for other international mitigation purposes. Thus, point (b) seems to contain an implicit reference to the voluntary carbon market and to indicate that voluntary offset programs will generate authorized and non-authorized ER. More explicit guidelines for voluntary carbon offset programs and on non-authorized emissions reduction are still missing.



5.2 Quality of offset projects and carbon credit use

One of the main concerns regarding carbon offsetting is that carbon credits may not represent actual GHG reductions. The quality of offset projects depends on the standards employed to evaluate them. As mentioned, a wide array of different standards exists, and this fragmentation leads to a considerable lack of transparency. The International Carbon Reduction and Offset Alliance (ICROA) is a non-profit initiative that aims at promoting best practices in carbon management and offsetting to support voluntary climate mitigation efforts and, among the various existing standards, endorses only those developed by CDM, JI, UK Woodland Carbon Code, Verified Carbon Standards (Verra), and The Gold Standard⁷ (see Box 5 on

⁷ The ICROA endorses also other standards of U.S. and Australian programs, but in line with the purpose of this report we only considered international or European standards.

ICROA basic standard requirements).⁸ Thus, projects certified using standards different from the ones just mentioned should be perceived as riskier in terms of environmental integrity.

Furthermore, carbon offsetting is often criticized because organizations may use carbon credits to continue to pursue high-emitting activities instead of making actual investments towards reducing their carbon footprint.

During the last COP26 meeting, there have been heated discussions over the fact that carbon offsetting can easily lead to greenwashing due to the use of low-quality offsets or/and abuse in the use of carbon credits by the private sector. It also emerged a serious concern regarding the integrity and quality of the voluntary carbon market and the need for standardization and a global carbon credit registry.

Box 5: Basic ICROA principles for offset projects

All carbon credits shall be in accordance with the following principles:

- **Real:** all emissions reductions and removals shall be proven to have genuinely taken place.
- **Measurable:** emissions reduction and removals must be real and quantifiable.
- **Permanent:** emissions reductions and removals should be permanent for at least 100 years.
- **Additional:** offset projects must generate carbon reductions over-and-above business-as-usual and regulatory requirements.
- **Independently verified:** all emission reductions and removals shall be verified to a reasonable level of assurance by an independent third-party verifier.
- **Unique:** each carbon credit must correspond to a single ton CO₂e.

⁸ The ICROA has also an accreditation program for businesses that deliver carbon reduction and offset services.

6. Other forms of carbon compensation

Other forms of carbon compensation initiatives exist that cannot be considered part of the voluntary carbon market as they do not issue carbon credits. Even though they typically establish some forms of standards, in most cases these are not disclosed. Most of these initiatives concern afforestation/reforestation programs and are developed by non-profit organizations. They sometimes sell “branded” certificates, which represent a removal/reduction of carbon emissions, but rarely keep registries.

It is difficult to ascertain the quality of these compensation initiatives, especially when the criteria they use to evaluate projects are not transparent. However, in some cases, they are sponsored by credible and renowned organizations, and this can be interpreted as a signal in favor of their integrity.

7. Carbon offsetting for WeCareMed projects

7.1 Basic implementation idea and related issues

The idea behind WeCareMed is that applicants to the Interreg Med program set aside a sum equivalent to the monetary value of their predicted carbon emissions to be invested in offset projects hosted in the MED area.

From an implementation standpoint, the original WeCareMed plan was for each applicant to invest discretionally the funds dedicated to carbon offsetting on one or more offset project/s and provide factual evidence of the investment in conjunction with the proposal submission. A list of available offset projects was intended to be made available to applicants as a reference and to be updated regularly by dedicated Interreg MED staff.

Even though this implementation approach is the best short-term option available given the current time constraints (the first call for Interreg MED projects is due in a few months), several critical issues are likely to emerge:

- A. If applicants can discretionally choose among all available offset projects in the MED area, there is a high risk of investments made in low-quality projects that do not lead to effective emissions reductions. The main reasons are:
 - Applicants may not be informed on the characteristics of offsetting programs and standards, thus not being able to discriminate among alternative projects;
 - Conflicts of interest instances might arise if applicants have personal reasons to invest in a project over another.

- B. Applicants are going to face operational problems when attempting to invest in offset projects:

- Given the small volumes of emissions that each applicant is asked to offset, applicants will encounter practical problems in the purchasing phase. Applicants will not be able to (or will not find it convenient to) access voluntary carbon market platforms or trade exchanges (they need to be accredited and purchase large volumes). Also, direct purchases from developers would be too time-consuming, require negotiation expertise, and it is often not a viable option for small investments. For these reasons, they will tend to invest in projects that are easy to find and finance (i.e. other compensating initiatives);
- If the list of projects provided is not updated daily, applicants may not be able to find some of the listed projects or may not be able to see new investment opportunities.

7.2 CRIEP's proposed solutions

A. Short-term solution

Provide applicants guidelines on carbon offsetting and a list of available projects with an indication of the level of riskiness of the project. Provide also a list of accredited carbon offsetting brokers/retailers.

List of offset projects for WeCareMed and guidelines

A list of the available offset project hosted in regions included in the Interreg Med program and their characteristics as of December 2021 is attached to this document.

Offset projects are divided into four categories:

- i. projects certified by international voluntary programs
- ii. projects certified by governmental voluntary programs
- iii. projects certified by independent programs with transparent standards and third-party validation
- iv. other compensation initiatives.

Guidelines on carbon offsetting for applicants with ICROA accredited brokers and developers are also attached to this document.

B. Long-term solutions

1. Hire a dedicated accredited broker/developer for the Interreg MED program via a call for bids. The broker will be put in contact with the applicants and invest funds for them in offset projects located in the MED area.

2. Centralize offsetting investments in the hands of the Interreg MED Managing Authority (MA). The Interreg MED MA will be in charge of collecting funds from the applicants and creating an Interreg MED offsetting fund. The Interreg MED MA will invest these funds in selected offset projects on the applicants' behalf. The investment in offset projects can be made:

- Through an accredited broker who is hired through a call for bids. The broker/retailer builds a curated portfolio of rigorously vetted, high-integrity carbon reduction and removal projects hosted in the MED area;
- By developing ad-hoc projects for the Interreg MED program. With the help of an accredited project developer hired through a call for bids, the Interreg MED MA invests in the development of offset projects in the MED area. The advantage of this approach is that it is possible to define the type of projects to support. The main disadvantage is that this approach requires time for its implementation;
- By hiring a certifier/starting a voluntary certification program and opening a call for bids for offset projects in the MED area. The Interreg MED MA becomes the administrative body of the new certification program and keeps a registry for EU-VER carbon credits.

CRIEP intends to further develop the two long-term proposals in a dedicated report to be completed by the end of the project.

C. Carbon Offsetting Guidelines for Applicants

This last section of the deliverable is aimed at providing carbon offsetting guidelines for future Interreg MED applicants, in order to formally instruct them about both the theoretical and practical key points concerning carbon offsetting measures and how to develop them to compensate the projects' GHG emissions.

Specifically, we first present and explain, in the form of a synthetic Q&A, the concepts whose understanding we consider to be key to develop an efficient awareness about compensation initiatives and offset projects. Afterwards, we focus our attention on more practical aspects: considering the different type of offset projects available on the market, we illustrate the several necessary steps an entity should follow in case of interest in purchasing carbon credits.

1. Key concepts and guidelines

What is carbon offsetting?

Carbon offsetting refers to a net reduction or removal of greenhouse gases (GHG) emissions that is made to compensate for emissions that occurred elsewhere.

Reductions aim at reducing or avoiding GHG emissions compared to a baseline scenario, for example through energy efficiency, renewable energy. Removals aim at removing GHG emissions by absorbing or capturing GHG emissions, for example through forestation projects or technological removal projects.

Why offset carbon emissions?

Carbon offsetting is an essential instrument to reach the Paris Agreement's objective of restricting the increase in the global average

temperature to well below 2°C above pre-industrial levels. Moreover, it allows to remove some emissions -emissions residuals- that cannot be reduced otherwise and, eventually, reach the European Union's target of net-zero by 2050.

Which carbon emissions should be offset?

Offsetting must only concern those GHG emissions that cannot be reduced or avoided by the individual/firm/organization producing them.

How can individuals/firms/organizations offset?

Individuals/firms/organizations can offset by investing in offset projects. In exchange for their investment, they receive carbon credits (1 carbon credit= reduction/removal of 1 tonne of CO₂e) that certifies the effective reduction/removal.

What are offset projects co-benefits?

Offset projects may produce social and environmental benefits beyond GHG reductions or removals. Depending on the project type, these co-benefits can include enhanced air or water quality, biodiversity and habitat conservation, community employment opportunities, improved energy access, and better access to community health and education services. These co-benefits are in line with some of the United Nations sustainable development goals.

What is greenwashing?

Carbon offsetting is considered greenwashing when individuals, firms or organizations do not prioritize in-house emissions reductions or

invest in low-quality carbon credits that do not represent effective GHG emissions reductions.

How to assess the environmental integrity of offset projects?

The quality and integrity of offset projects depends on the offset program that certifies them. There is a wide range of programs, each with its administrative entity, standards (criteria and protocols), verification and monitoring procedures, and registry. Some programs have standards that are more complete than others and, for this reason, are considered more trustworthy.

Which offset programs are more trustworthy/are high-quality?

The International Carbon Reduction and Offset Alliance (ICROA) is an international non-profit initiative that aims at promoting best practices in carbon offsetting to support voluntary climate mitigation efforts. The ICROA has endorsed the standards of certain international programs (VERRA, Gold Standard, American Carbon Registry, Climate Action Reserve, UK Woodland Carbon Code, ERF of the Australian Government).

What about other carbon compensation initiatives?

Other forms of carbon compensation initiatives exist, such as afforestation/reforestation programs. These initiatives do not issue carbon credits and, often, do not disclose their quality standards or keep registries. For this reason, the effective sequestration of CO₂ is not guaranteed.

Are there offset projects in the MED area?

Currently, the number of offset projects in the MED area is limited, but it is expected to increase over the next years. A list of available projects is attached to this document.

2. Practical Advice: how can individuals invest in offset projects?

Most investments in offset projects happen over-the-counter, that is via direct negotiations with the project developer. These negotiations are made on offset program platforms. A more convenient approach for investing funds in offset projects (especially in the case of small transactions) is to do it via a dedicated broker/retailer. The ICROA provides a list of accredited brokers that can build a portfolio of rigorously vetted, high-integrity carbon reduction and removal projects (The updated list is available at this link: <https://www.icroa.org/organisations>):








- CARBON SINK: <https://www.carbonsink.it/en/sustainable-development-strategies/carbon-neutrality>
- FORLIANCE: <https://forliance.com/climate-solutions/carbon-offsetting>
- CLIMATE NEUTRAL GROUP: <https://www.climateneutralgroup.com/en/a-to-zero-co2/offsetting/>
- ECOACT: <https://eco-act.com/service/voluntary-carbon-offsetting/>
- 3DEGREES: <https://3degreesinc.com/services/carbon-credits/>

As argued, in order to provide a practical step-by-step advice to future applicants, we tried to investigate some of the technicalities behind the acquisition of carbon credits according to the different type of programme and categories we selected in the offset market. In the following, therefore, we are going to focus on specific categories of projects and present the necessary steps to start the purchasing process. The programs considered are: the Verra Registry, the Gold Standard Registry, the Spanish Governmental Offset Projects, the Italian Independent Offsets projects and the pool of residual projects we call Other Carbon Compensation Initiatives.

2.1 Gold Standard Registry

- [Gold Standard](#) suggests that individuals and businesses may purchase carbon credits via their marketplace. However, here there is a very small number of projects to choose from.
- Therefore, for larger-scale purchases, they recommend reaching out to the project developers directly to make a purchase. This procedure is the most feasible for the projects guaranteed by the [Gold Standard Impact Registry](#).
- Let us take an example from GS Registry which is also available for WECAREMED. For the project “[SEKEM TREE PROJECT](#)”, the developer’s name can be easily found on the GS Registry. You may find further information inside the list of Certification Documents, such as the “GOLD STANDARD VALIDATION REPORT FOR A/R REGISTRATION BASIC INFORMATION”.


SEKEM TREE PROJECT

GS ID 4894		PRODUCT  PER	1905 ISSUED	1520 ASSIGNED	ESTIMATED SDG IMPACTS   	PROJECT TYPE  Other	STATUS  Gold Standard Certified Design
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PROJECT DEVELOPER	SEKEM for Land Reclamation (SLR)	DESCRIPTION	Land use and forest Afforestation/Reforestation (A/R)
METHODOLOGY	Afforestation/Reforestation GHG Emissions Reduction & Sequestration Methodology	CREDITING PERIOD	Feb 01, 2016 – Feb 01, 2036
STANDARDS VERSION	Gold Standard for the Global Goals	ANNUAL ESTIMATED CREDITS	5,000
PROJECT SCALE	Micro scale	PROJECT TYPE	Other

2.2 Verra Registry

- Likewise, on the [Verra Registry](#), you may find all the information about the developer and how to contact the people in charge.
- On the project's page you will see additional files, such the Project Description, where you can find the mails to contact. Here an [example](#) of a carbon compensation project in Tunisia.



TATAOUINE SOLAR PHOTOVOLTAIC PLANT IN TUNISIA

The project activity involves installation of a 9.98 MW Greenfield solar power project in Tataouine Governorate, Tunisia. The project will be connected to the National Electrical Grid of Tunisia, which is mainly dominated by thermal/fossil fuel based power plant. The total installed capacity of the project activity is 9.98 MW, and the estimated average annual net electricity supply is 21.928 GWh/year. The project will displace an equivalent amount of power generation from fossil fuel combustion and reduce approximately 14.376 tCO₂e anthropogenic emissions of greenhouse gases (GHG's) per annum. A 30 day public comment period was held for this project from 16 October to 17 November. No comments were received during the public comment period

PROJECT SUMMARY

ID
1963

State/Province
Tataouine Governorate

VCS

Proponent
SEREE

VCS Project Status
Registered

Estimated Annual Emission Reductions
14376

VCS Project Type
Energy industries (renewable/non-renewable sources)

VCS Methodology
AMS-I.D.

VCS Project Validator
RINA S.p.A (RINA)

Crediting Period Term
1st, 14/03/2020 - 13/03/2030

VCS PROJECT DESCRIPTION: VCS Version 3

TATAOUINE SOLAR PHOTOVOLTAIC PLANT IN TUNISIA

Document Prepared By (South Pole Carbon Asset Management Ltd.)

Project Title	Tataouine Solar Photovoltaic Plant in Tunisia
Version	01
Date of Issue	22/08/2019
Prepared By	Jane Duan
Contact	Physical address: Technoparkstrasse 1, 8005 Zurich, Switzerland Telephone: +41 43 501 35 53 Email: j.duan@southpole.com Website: https://www.southpole.com

1.3 Project Proponent

Organization name	SEREE
Contact person 1	Federico Pugliese
Title	Chef de Département Energies Renouvelables
Address	Eni Tunisia Immeuble IRIS - Rue du Lac de Côme - Berges Du Lac - 1053 - Tunis
Telephone	+216 71166245
Email	Federico.Pugliese@eni.com
Contact person 2	Margherita Zappelloni
Title	Energy Solutions Environmental Manager
Address	20097 Piazza Boldrini 1 San Donato Milanese (MI) - Italy
Telephone	+39 02 520 62814

v3.3 3

VCS PROJECT DESCRIPTION: VCS Version 3

Email margherita.zappelloni@eni.com



1.4 Other Entities Involved in the Project

Organization name	South Pole Carbon Asset Management Ltd.
Role in the project	Project Consultant
Contact person	Jane Duan
Title	Project Manager
Address	Technoparkstrasse 1, 8005 Zurich, Switzerland
Telephone	+41 43 501 35 53
Email	j.duan@southpole.com

2.3 Spanish governmental offset projects

- To begin the purchasing process of credits from Spanish governmental offset projects, you must directly contact the project's developer.
- You may find all the certified projects on the Spanish Ministry for Ecological Transition and Demographic Challenge ([MITECO](#)). Also, at the end of this document, many examples of initiatives are provided.
- For instance, for the project "[PROYECTO DE FORESTACIÓN Y PLAN DE GESTIÓN DE UNA PARCELA EN LA MINA DE PORTOMÉ](#)", one can easily notice the name of the promoter at the beginning of the file and find the email at the bottom of the second page.

	GOBIERNO DE ESPAÑA	MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO	
REGISTRO DE HUELLA DE CARBONO, COMPENSACIÓN Y PROYECTOS DE ABSORCIÓN DE DIÓXIDO DE CARBONO			
PROYECTO DE ABSORCIÓN			
PROYECTO DE FORESTACIÓN Y PLAN DE GESTIÓN DE UNA PARCELA EN LA MINA DE PORTOMÉ			
TITULAR:	<u>PORCELANOSA S.A.U.</u>		
Código:	2021-b002	Tipo de proyecto:	Cambio de uso

	GOBIERNO DE ESPAÑA	MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO	
DOCUMENTACIÓN PRESENTADA AL REGISTRO:			
<ul style="list-style-type: none">➤ Documento acreditativo del uso del suelo de la parcela a 31/12/1989 y del uso previo al proyecto: Ortofoto PNOA 2018 y Corine Land Cover 1990 y 2018.➤ Documento acreditativo de que el proyecto se ha puesto en marcha: Fotografías del resultado de las obras.➤ Documentos acreditativos de que se cumple con la legislación aplicable a dicho proyecto: Convenio entre Portomé (ostenta los derechos de extracción minera) y Porcelanosa.➤ Sistema de aseguramiento de la permanencia del proyecto en el tiempo: Convenio entre Portomé (ostenta los derechos de extracción minera) y Porcelanosa.➤ Certificación del Registro de la Propiedad u otro documento acreditativo de que el solicitante posee los derechos sobre las absorciones generadas en la parcela: Ficha descriptiva del Catastro			
Datos de contacto: JESÚS DAVID SÁNCHEZ LABRADOR Email: jdavid@bosquessostenibles.com Teléfono: 666812676			

2.4 Italian independent offset projects

- In the section “List of projects” at the end of this document, you can find a link either for the developer’s site or the [VER eCO2care Registry](#).
- Either way, potential investors are supposed to directly **send an email to the entity** in charge of the project. For instance, for the project “[Valle Lagunare - Val Dogà, Caposile-Venezia](#)” developed by [Blue Valley](#), there is a brief description of the purchasing process. While in the VER eCO2care website you can find the email to contact.

Come funziona?

Primo step

Assicurarsi di aver calcolato l'impronta di carbonio legata alle attività aziendali e prendere i [contatti](#) con Blue Valley.

Secondo step

Blue Valley procede alla verifica dei valori comunicati dall'azienda e valuta la disponibilità di crediti di carbonio.

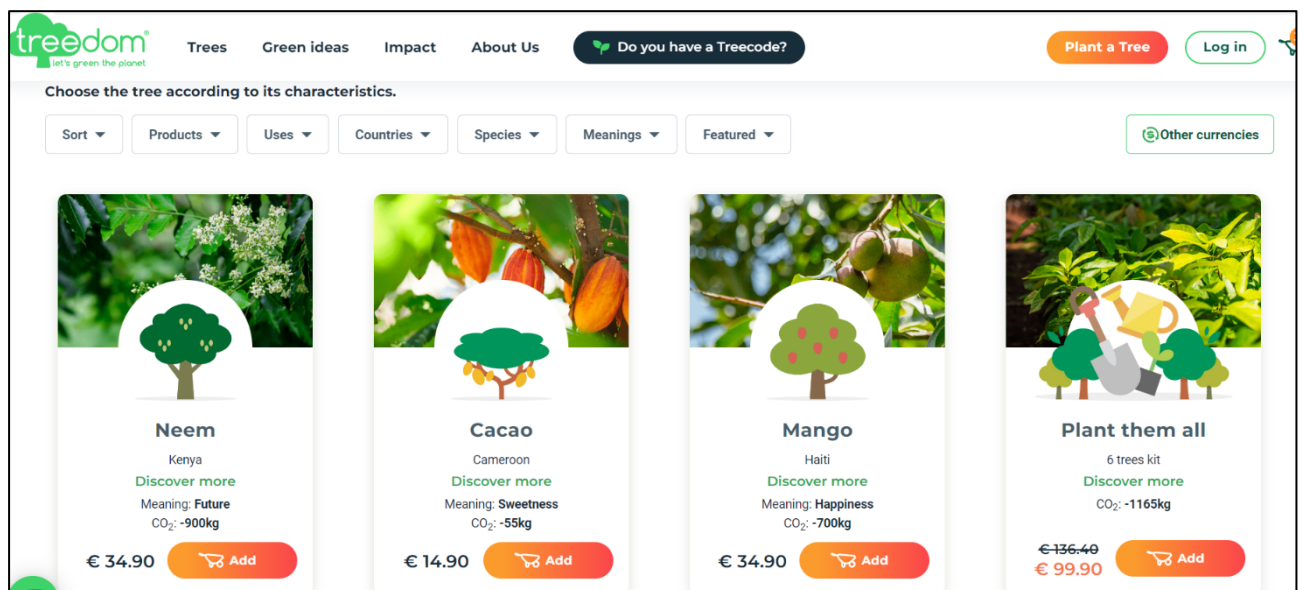
Terzo step

Entro un mese dall'avenuto pagamento, Blue Valley procede al rilascio del certificato di conformità dell'avenuta compensazione.

Progetto Derovere  <p>Riforestazione di una campo di graminacee, sito a Derovere, ad uso agricolo intensivo con una foresta di bambù al fine di massimizzare la captazione di gas serra e la protezione del suolo da rischi idrogeologici e di erosione</p>		DOCUMENTI CORRELATI PDD/PIN VER Validation Report Validation Conformity Statement																	
TABELLA RIASSUNTIVA PROGETTO <table border="1"> <thead> <tr> <th>Anno di registrazione</th> <th>Tipo di progetto</th> <th>Paese</th> <th>Validatore</th> <th>VER registrati</th> <th>VER ritirati</th> <th>VER opzionati</th> <th>VER disponibili</th> </tr> </thead> <tbody> <tr> <td>2021</td> <td>Afforestation and reforestation</td> <td>Italia</td> <td>Istituto Tecnologico Europeo di Certificazione s.r.l.</td> <td>69650</td> <td>0</td> <td>32916</td> <td>36734</td> </tr> </tbody> </table>		Anno di registrazione	Tipo di progetto	Paese	Validatore	VER registrati	VER ritirati	VER opzionati	VER disponibili	2021	Afforestation and reforestation	Italia	Istituto Tecnologico Europeo di Certificazione s.r.l.	69650	0	32916	36734	CONTATTO PROGETTO Proponente: Francesca Capano SOCIETA' AGRICOLA GAIA S.R.L. VIA NAZIONALE N°7 88069 Squillace (Catanzaro) Italia Email: societaagricolagaia srl@gmail.com	
Anno di registrazione	Tipo di progetto	Paese	Validatore	VER registrati	VER ritirati	VER opzionati	VER disponibili												
2021	Afforestation and reforestation	Italia	Istituto Tecnologico Europeo di Certificazione s.r.l.	69650	0	32916	36734												

2.5 Other carbon compensation initiatives

- Investing in compensation projects through acknowledged initiatives such as [Treedom](#) and [Plant for the Planet](#) is much more straightforward.
- They give buyers the opportunity to choose from many different projects around the world. Hence, one can select not only from MED and ENPI areas but also from South America, Africa, and South Asia. Moreover, the purchase usually takes **less than 5 minutes**.
- The main shortfall is that such projects are more **feasible for small donations** rather than larger offset initiatives.



3. List of Offset projects in the MED Area

Offset projects in the MED area									
Project Name	Host Country	Developer Country	Type of project	Offset program	Auditor/ Validator	Registry	State	Available	Website
International independent offset projects									
Golden Union Fitting Retrofit	No	Greece	Energy Efficiency - Transport Sector	Gold Standard (ICROA)	Gold Standard accredited validator	Gold Standard	Listed	No	https://registry.goldstandard.org/projects/details/3197
Anaerobic digestion	Cyprus	Cyprus	Destruction of methane	Verra (ICROA)	Tuev Sued Industrie Service GmbH (Tuev Sued)	Verra	Registered	No	https://registry.verra.org/app/projectDetail/VCS/888
Anaerobic digestion	Cyprus	Cyprus	Recover the methane emissions from animal manure	Verra (ICROA)	Tuev Sued Industrie Service GmbH (Tuev Sued)	Verra	Registered	No	https://registry.verra.org/app/projectDetail/VCS/956
Vjosë-Nartë A/R	Albania	Italy	Agriculture Forestry and Other Land Use	Verra (ICROA)	Spanish Association for Standardisation and Certification (AENOR)	Verra	Under validation	No	https://registry.verra.org/app/projectDetail/VCS/2547
Spanish governmental offset projects									
Bosque orange ejulve	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	No	https://www.miteco.gob.es/images/es/2021-b040_tcm30-532400.pdf

Restauracion forestal y creacion de sumidero forestal en dos aguas (valencia)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b023_tcm30-530674.pdf
Bosque satorisan 2.0	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b026_tcm30-529547.pdf
Finca el arreaque	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b010_tcm30-529552.pdf
Proyecto de forestación y plan de gestión de una parcela en la mina de portomé	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b002_tcm30-529549.pdf
Bosque natural world	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2020-b029_tcm30-523099.pdf
Crisnova	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b017_tcm30-520716.pdf
Actuaciones para la recuperación del bosque de ribera en los márgenes del río segura en el entorno de la planta potabilizadora	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2020-b021_tcm30-513823.pdf

de aguas de murcia									
Bosque endesa. Doñana	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2020-b008_tcm30-513806.pdf
Bosque satorisan	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	No	https://www.miteco.gob.es/images/es/2020-b009_tcm30-513807.pdf
Repoblación forestal en el monte "la capellanía"	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2018-b003_tcm30-501980.pdf
Absorbemos co2 en ejulve (teruel)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b007_tcm30-497376.pdf
Torres ecológic, s.l.u. (riudabella)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2015-b007_tcm30-180081.pdf
Absorbemos co2 en montoro (teruel). Sylvestris	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b008_tcm30-497379.pdf
Absorbemos co2 en vall d'ebo. Sylvestris	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b006_tcm30-489665.pdf

Bosque caixabank en ejulve (teruel)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b005_tcm30-489619.pdf
Bosque eurofred en ejulve (teruel)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b004_tcm30-487585.pdf
Bosque eurofred en artana (castellón)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b003_tcm30-487587.pdf
Absorbemos co2 en montserrat. Sylvestris	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b002_tcm30-489618.pdf
Vereda molino san vicente	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2018-b004_tcm30-452723.pdf
Proyecto de absorción de eurofred en la vall d'ebo (alicante)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	No	https://www.miteco.gob.es/images/es/2017-b011_tcm30-425914.pdf
Operación co2. Espai natura muntanya d'alinyà	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2016-b006_tcm30-382430.pdf
Proyecto de absorción de co2 de la fundación aquae en zona incendiada en pego (alicante)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2016-b005_tcm30-180828.pdf

Reforestación de eurofred en zona incendiada del parque natural de la muntanya de montserrat (barcelona)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	No	https://www.miteco.gob.es/images/es/2/016-b004_tcm30-180498.pdf
Torres & earth - montllolat	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/015-b008_tcm30-180107.pdf
Restauración forestal en la finca sa duaia-es recó	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/016-b010_tcm30-180536.pdf
Torres & earth - pierola	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/015-b006_tcm30-180550.pdf
Bosque caixabank payments & consumer. Montserrat	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b102_tcm30-540092.pdf
Bosque co2gestion "la carballeda"	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b109_tcm30-534356.pdf
Bosque co2gestion "tierra de campos"	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b129_tcm30-535774.pdf
Bosque chiruca iv	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b003_tcm30-538755.pdf

Bosque chiruca iii	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/019-b001_tcm30-487590.pdf
Bosque chiruca ii	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/017-b010_tcm30-438315.pdf
Bosque chiruca	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/015-b005_tcm30-180477.pdf
Eccoforest manzanares 2	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/022-b028_tcm30-542234.pdf
Bosque fastighetsbyran 1	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b183_tcm30-540123.pdf
Bosque fastighetsbyran 2	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b184_tcm30-540128.pdf
Bosque viewnext aldeatejada	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b224_tcm30-539814.pdf
Ecco-forest	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b063_tcm30-533602.pdf
Bosque airbus	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/020-b018_tcm30-513808.pdf

Bosque alimerka	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b014_tcm30-537917.pdf
Bosque acqueae valderrey	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2018-b007_tcm30-485653.pdf
Bosque autoctono de absorción de c02	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b045_tcm30-542216.pdf
Bosque caixabank montserrat	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2018-b005_tcm30-532077.pdf
Repoblación forestal en el mup nº 134 "orzaduro". T.m. San martín del pimpollar	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2015-b001_tcm30-449639.pdf
Bosque acr	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2022-b029_tcm30-539817.pdf
Arzádegos 2020	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b049_tcm30-530715.pdf
Arzádegos 2019	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b048_tcm30-530677.pdf
Arzádegos 2017	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b047_tcm30-530676.pdf

Arzádegos 2013	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b046_tcm30-530675.pdf
Restauración forestal en el monte de utilidad pública nº176 "corconte, dehesa y soto". T.m. Campoo de yuso	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2014-b001_tcm30-179984.pdf
Mijares project (avila)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Not yet	https://mail.google.com/mail/u/1?ui=2&ik=52d1af57fa&attid=0.4&permmsgid=msg-f:1739402543635311492&th=18239965ceb2b84&view=att&disp=inline
Alquibosque	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2022-b002_tcm30-542217.pdf
Amicoszeroco2	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b149_tcm30-538756.pdf
Alcoroches	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2018-b009_tcm30-485654.pdf
Absorbemos co2 en torremocha de jarama (madrid).	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2020-b010_tcm30-509307.pdf

Absorbemos co2 en torremocha de jarama (madrid). Sylvestris									
Proyecto de absorción mvmc de doade 2019. Ayuntamiento de sober (lugo)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b222_tcm30-540134.pdf
Bosque capitán denim	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b016_tcm30-530427.pdf
Bosque co2gestion "ribera de duero"	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b130_tcm30-537338.pdf
Bosque co2gestion "tierra de rueda i"	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b135_tcm30-539811.pdf
Bosque co2gestion "tierra de rueda ii"	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b136_tcm30-539812.pdf
Bosque co2gestion "tierras de berlanga"	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/021-b134_tcm30-539819.pdf
Bosque consuegra	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2/020-b001_tcm30-508724.pdf

Bosque de los sueños	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/buscador_proyectos.aspx
Bosque del petróleo de la lora	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2020-b002_tcm30-520717.pdf
Bosque endesa teruel	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b099_tcm30-534355.pdf
Bosque mutualidad de la abogacía ejulve	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b150_tcm30-537919.pdf
Bosque ferrovial torremocha de jarama ii (madrid)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b115_tcm30-534358.pdf
Bosque eulen	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2017-b005_tcm30-382434.pdf
Bosque ohla	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b156_tcm30-539813.pdf
Bosque normagrup	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b079_tcm30-531433.pdf

Bosque telefónica	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b212_tcm30-538762.pdf
Bosque ros roca – el bruc	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2021-b120_tcm30-537336.pdf
Bosque reforest	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2022-b019_tcm30-542220.pdf
Campgaia	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2018-b002_tcm30-449625.pdf
Callaghan o2. Fase ii	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2020-b007_tcm30-529546.pdf
Creación de una superficie forestal en retortillo de soria (soria)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2022-b017_tcm30-539815.pdf
Creación de una superficie forestal de pino piñonero en cubo de la solana (soria)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2022-b020_tcm30-542211.pdf
Convenio forestal entre la junta vecinal de gibaja y sniace	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2019-b019_tcm30-520726.pdf

Comunidade de montes veciñais en man común de o viso	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2020-b006_tcm30-509306.pdf
Bosque endesa. La atalaya	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/images/es/2017-b006_tcm30-382427.pdf
Fdi-compensa co2 en san sebastián de los reyes	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
¡Reacciona! Sumidero de carbono de hellín	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
Repoblación del monte público “los llanos” en el término municipal de monachil (granada)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
Viñuelas absorbe co2	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf

Renaturalización sostenible del antiguo vertedero de valdellozo	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
Galicia rexenera 2021: san miguel de tabagon (o rosas)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
Galicia rexenera 2021: a pedra torta (caldas de reis)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
Repoblación forestal monte de utilidad pública nº 60 "valle de iruelas" - fase 1 (t.m. El barraco)	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
Absorbemos co2 en la umbría. Ejulve	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf
Huella verde, sumidero co2	Spain	Spain	Afforestation and reforestation	Miteco (Spain)	No	Miteco (Spain)	Issued	Yes	https://www.miteco.gob.es/es/cambio-climatico/temas/mitigacion-politicas-y-medidas/proyectos-preinscritos_tcm30-479334.pdf

									tigacion-politicas-y-medidas/proyectos/preinscritos_tcm30-479334.pdf
Italian independent offset projects									
Valle Lagunare - Val Dogà, Caposile-Venezia	Italy	Italy	Agriculture	CESISP	Bios srl	Eco2care	Issued	Yes	https://www.bluev.it/
Valle laguranre Rosolina	Italy	Italy	Agriculture	CESISP	Bios srl	Eco2care	Issued	No	http://www.eco2care.org/Dettagli_Progetto.aspx?Id_Progetto=19
Abbattimento biogas sistema geCO2	Italy	Italy	Waste handling and disposal	CESISP	Rina spa	Eco2care	Issued	Yes	http://www.eco2care.org/Dettagli_Progetto.aspx?Id_Progetto=2
Bambù Monte Milone	Italy	Italy	Afforestation and reforestation	CESISP	Bureau Veritas	Eco2care	Issued	Yes	http://www.eco2care.org/Dettagli_Progetto.aspx?Id_Progetto=19
Piantumazione di bambù	Italy	Italy	Afforestation and reforestation	CESISP	Istituto Tecnologico Europeo di Certificazione s.r.l.	Eco2care	Issued	Yes	http://www.eco2care.org/Dettagli_Progetto.aspx?Id_Progetto=28
Progetto Derovere	Italy	Italy	Afforestation and reforestation	CESISP	Istituto Tecnologico Europeo di Certificazione s.r.l.	Eco2care	Issued	Yes	http://www.eco2care.org/Dettagli_Progetto.aspx?Id_Progetto=29

4. List of Offset projects in the ENPI Area

Independent offset projects in the ENPI area										
Project Name	Host Country	Developer Country	Type of project	Offset program	Auditor	Registry	Crediting Period	Annual estimated emission reductions (tCO ₂ e)	State	Website
GROUPED SOLAR PROJECT IN JORDAN CLEAN	Jordan	United Arab Emirates, Switzerland	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	LGAI Technological Center, S.A. (Applus+)	Verra	01/12/2019 - 30/11/2029	39475	Registered	https://registry.verra.org/app/projectDetail/VCS/2016
ENERGY EFFICIENCY PROJECT IN THE RAMLA CEMENT PLANT IN ISRAEL	Israel	Israel, India	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	Det Norske Veritas Climate Change Services AS (DNV)	Verra	CREDITING PERIOD HAS EXPIRED, 01/06/2006 - 31/05/2016	8165	Registered	https://registry.verra.org/app/projectDetail/VCS/38
OFFIS TEXTILE LTD. FUEL SWITCH, ISRAEL	Israel	Israel, Uruguay	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	Det Norske Veritas Climate Change Services AS (DNV)	Verra	CREDITING PERIOD HAS EXPIRED, 01/06/2006 - 31/05/2016	9243	Registered	https://registry.verra.org/app/projectDetail/VCS/39

TATAOUINE SOLAR PHOTOVOLTAIC PLANT IN TUNISIA	Tunisia	Tunisia	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	RINA S.p.A (RINA)	Verra	14/03/2020 - 13/03/2030	14376	Registered	https://registry.verra.org/app/projectDetail/VCS/1963
WASTE GAS-BASED COGENERATION PROJECT AT ALEXANDRIA CARBON BLACK	Egypt	Egypt	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	Det Norske Veritas Climate Change Services AS (DNV)	Verra	03/05/2022 - 02/05/2029	26597	Registered	https://registry.verra.org/app/projectDetail/VCS/854
200 MW KOMOMBO SOLAR PV POWER PROJECT IN EGYPT	Egypt	Egypt	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	KBS Certification Services Pvt. Ltd.	Verra	01/04/2021 - 31/03/2031	340821	Registered	https://registry.verra.org/app/projectDetail/VCS/2046
BENBAN SOLAR PV PROJECT PLOT 42_4	Egypt	Egypt	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	4K Earth Sciences Private Limited	Verra	20/08/2019 - 19/08/2029	34914	Registered	https://registry.verra.org/app/projectDetail/VCS/2008
BENBAN SOLAR PV PROJECT PLOT 43_4	Egypt	Egypt	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	4K Earth Sciences Private Limited	Verra	08/09/2019 - 07/09/2029	83683	Registered	https://registry.verra.org/app/projectDetail/VCS/2007
BENBAN SOLAR PV PROJECT PLOT 3_1	Egypt	Egypt, UK	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	4K Earth Sciences Private Limited	Verra	27/08/2019 - 26/08/2029	85879	Registered	https://registry.verra.org/app/projectDetail/VCS/2003

OUARZAZATE IV CONCENTRATED SOLAR POWER PROJECT	Morocco	Morocco	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	VCS Validation/Verification Body	Verra	04/07/2018 - 03/07/2025	150272	Registered	https://registry.verra.org/app/projectDetail/VCS/2036
OUARZAZATE III CONCENTRATED SOLAR POWER PROJECT	Morocco	Morocco	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	Earthood Services Private Limited	Verra	06/11/2018 - 05/11/2025	406293	Registered	https://registry.verra.org/app/projectDetail/VCS/2005
OUARZAZATE II CONCENTRATED SOLAR POWER PROJECT	Morocco	Morocco	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	Earthood Services Private Limited	Verra	25/04/2018 - 24/04/2025	406293	Registered	https://registry.verra.org/app/projectDetail/VCS/2004
OUALIDIA 1&2 WIND PROJECTS.	Morocco	France, US	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	Earthood Services Private Limited	Verra	01/01/2020 - 31/12/2029	54114	Registered	https://registry.verra.org/app/projectDetail/VCS/1989
FOUM EL OUED WIND FARM PROJECT	Morocco	Morocco, India	Energy industries (renewable /non-renewable sources)	Verra (ICROA)	SGS United Kingdom Ltd. (SGS)	Verra	01/03/2013 - 28/02/2023	141991	Withdrawn	https://registry.verra.org/app/projectDetail/VCS/1062
WEST BAKR WIND FARM PROJECT	Egypt	Egypt (promoted by Lekela Egypt Wind Power BOO (S.A.E.))	Wind - Displacement of GHG emission for energy consumption	Gold Standard (ICROA)	Gold Standard accredited validator	Gold Standard	13/11/2021 - 12/11/2026	688021	Listed	https://registry.goldstandard.org/projects/details/2584

SEKEM TREE PROJECT	Egypt	Egypt (SEKEM for Land Reclamation (SLR))	Land use and forest Afforestation/Reforestation (A/R)	Gold Standard (ICROA)	Gold Standard accredited validator	Gold Standard	01/02/2016 - 01/02/2036	5000	Gold Standard Certified Design	https://registry.goldstandard.org/projects/details/1721
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5. Other carbon compensation initiatives

Other carbon compensation initiatives											
Name initiative/ company	Country	For profit?	Host Country	Adoption certificate	Type of project	Registry	Scale	Third party validator	Sponsor	Price per tree	Website
ReforestACTION	France	Yes	Portugal Spain France	No	Reforestation	No	International	Ecocert Environment	UN ecosystem restoration	3\$	https://www.reforestation.com/en/
GreenCyprusCom	Cyprus	No	Cyprus	Yes	Reforestation	No	National	No	Department of Forests of the Republic of Cyprus	25 €	https://greencyprus.com/en/
Treedom	Italy	Yes	Italy Croatia	Yes	Afforestation and reforestation	Yes	International	No		From 16€	https://www.treedom.net/en/
Tree Nation	Belgium	No	Spain Portugal France	Yes	Afforestation and reforestation	No	International	No	UNEP	From 2€	https://tree-nation.com/
Plant for the planet	Germany	No	Spain Italy	Yes	Afforestation and reforestation	Yes	International	Conafor, PNK	UNEP, UN ecosystem restoration	9 €	https://a.plant-for-the-planet.org/faq

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