

AIN•CAPITAL — reports



Soil organic carbon monitoring market

in partnership with

moljar

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Market overview:

The estimates of the global market by various research agencies:

- according to [Mordor Intelligence](#), in 2020 the carbon management system market was valued at \$10.93b and it is projected to be worth \$19.83b by 2026. The market for carbon credits could be worth upward of \$50b in 2030;
- according to [Allied Market Research](#), in 2020 the global emission management software market size was valued at \$10.4b and is projected to reach \$43.6b by 2030;
- according to [KBV research](#), in 2020 emission management software market size value was \$7.7b, and is forecast to reach \$25.43b in 2027;
- according to [Farmonline](#), as of 2021 the global carbon market was valued at \$369b.

Market analysis has allowed us to determine the top-5 soil organic carbon (SOC) monitoring companies in the world and the top-11 companies headquartered in Australia or operating in the Australian market.

Global market

According to [Mordor Intelligence](#), North America accounts for the largest market share, and according to [KBV research](#), the region would continue to be a dominant market, achieving a market value of \$9.94b by 2027.

The top-5 carbon management software companies in the world are [Simple Solutions](#) (Australia), [IBM Corp](#) (USA), [Engie Impact](#) (USA), [GreenStep Solutions](#) (Canada) and [SAP](#) (Germany). As of February 2022, EV of Simple Solutions is \$6.36m, IBM Corp - \$159.5b, Engie (parent organization, in 2019 Engie [launched](#) its subsidiary Engie Impact) - \$60.39b, SAP - \$145.99b. GreenStep Solutions hasn't disclosed its financial data.

Simple Solutions has its own platform [CarbonView](#), Engie Impact - its carbon intelligence platform [Ellipse](#), while GreenStep Solutions offers [EcoBase Solutions](#) for the calculations by using regional, national, and international emissions factors.

In October 2021 the U.S. Department of Agriculture ([USDA](#)) [announced](#) investing \$10m in a new initiative to sample, measure, and monitor soil carbon on Conservation Reserve Program ([CRP](#)) acres to better quantify the climate outcomes of the program. USDA partners will conduct soil carbon sampling on three categories of CRP practice types: perennial grass, trees, and wetlands.

Recent developments of top-5 companies:

- in November 2021, Simple Solutions [signed](#) a five-year partnership with Australian energy consultancy [Choice Energy](#), which specializes in utility cost reduction for businesses and private customers and manages over 4.5k customer accounts across Australia and New Zealand. Under the terms of the five-year agreement, Choice will offer "CarbonView-SME" to its customers as a service, the platform will be available to all Choice clients from January 2022;
- the U.S. General Services Administration made a contract with IBM Corp to install efficient and smart building technologies in 50 of the state and federal government's highest energy-consuming buildings. In January 2021 IBM [joined](#) the Massachusetts Institute of Technology (MIT) cross-industry climate change-tackling consortium, a cross-industry initiative geared toward accelerating the development pace of climate change-tackling technologies and innovations. In October 2021 IBM [launched](#) the Environmental Intelligence Suite. This suite aimed to assist enterprises to streamline and automate the management of environmental risks and start the operations of underlying processes that include carbon accounting and reduction, to fulfill environmental objectives;
- Engie has [partnered](#) with Abu Dhabi energy department on a tech-driven sustainability project in January 2021 to help rehabilitate the emirate's mangrove habitats. This initiative uses specialized, custom UAE-built drones and rigging to plant thousands of mangrove seeds near the Mirfa power plant in Abu Dhabi and monitor their growth over the year. They are vital in the storage of blue carbon – the term for carbon captured by the world's oceans and coastal ecosystems, including seagrasses, mangroves, and salt marshes;
- GreenStep Solutions and the Tourism Industry Association of Canada ([TIAC](#)) [launched](#) the Sustainable Tourism 2030 Pledge in June 2021 that encourages both national and international tourism businesses and destinations to continuously improve their sustainability performance between now and 2030;
- [Döhler](#), a provider of technology-based natural ingredients, ingredient systems, and integrated solutions for the food and beverage industry, [collaborated](#) with SAP in May 2020 to run a co-innovation engagement to carry out a pilot project named "Climate 21". As part of the pilot program, the SAP Product Carbon Footprint Analytics ([launched](#) in June 2020) was installed for its products.

All in all, in recent years, private companies have [launched](#) a variety of agricultural carbon market programs, most of which engage with voluntary carbon markets. Most programs assist participants in producing, verifying, and selling carbon offsets in a carbon marketplace.

Carbon markets:

A carbon market is an economic framework that supports the buying and selling of environmental commodities that signify GHG emission reductions or sequestration. There are also [Compliance Carbon Markets](#), which typically support a regulatory program that requires GHG emission reductions. Examples include:

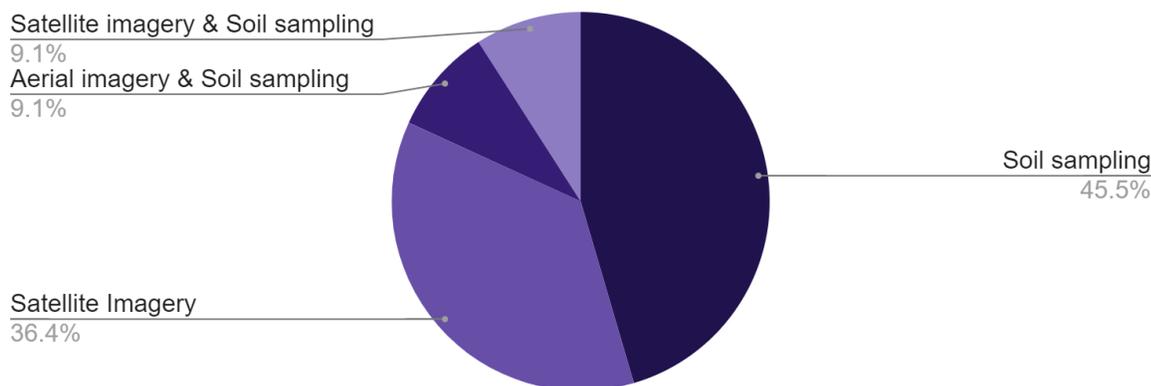
- [California Cap-and-Trade Program](#) which covers approximately 80% of the state's GHG emissions. In the auction held in August 2021, the settlement price was \$23.30/metric ton of carbon dioxide equivalent. As of September 2021, the state has approved and issued approximately 225m offset credits;
- [Regional Greenhouse Gas Initiative \(RGGI\)](#) which applies to CO2 emissions from electric power plants. In RGGI's September 2, 2021, auction, the clearing price was \$9.30/ton of CO2;
- [European Union Emissions Trading System \(EU-ETS\)](#) - a cap-and-trade program that covers emissions from the electricity sector, selected energy-intensive industries, and domestic aviation. In September 2021 EU-ETS emission allowance price was \$70/metric ton.

Australian market

During the research, 11 companies were analyzed: [GreenCollar](#), [Regrow](#) (ex-Flurosar), [Cloud Agronomics](#), [Carbon Sync](#), [Carbon Asset Solutions](#), [Deep Planet](#), [Carbon Neutral](#), [Precision Agriculture](#), [SelectCarbon](#), [FarmLab](#), [Hummingbird technologies](#). The 8 of the 11 companies are headquartered in Australia, 2 - in the US, 1 - in the UK. The companies were established between 2001 and 2018, the largest amount was founded in 2018 - 3 companies. The known staff of the companies varies from 5 to 83 employees, the median is 23 employees.

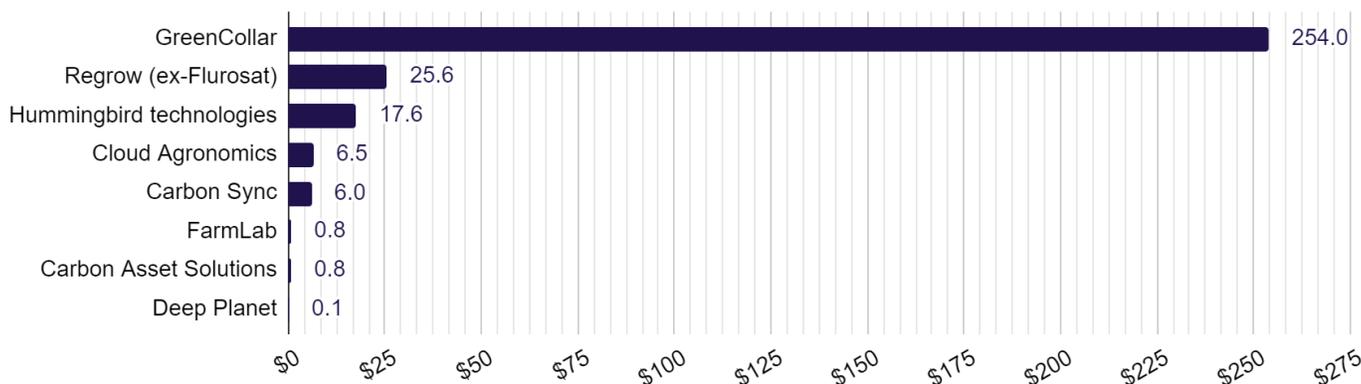
The traditional method of analyzing carbon content in soil is physical sampling. Mapping the spatial variability of carbon content and stocks is also possible using spatial models that include environmental covariates derived from satellite imagery and radar systems. Out of 11 companies 5 use the soil sampling method exclusively, while 4 rely on analyzing data from satellite imagery, and another one (SelectCarbon) - uses a combination of both: firstly, satellite imagery is used to quantify carbon areas and carbon storage itself is then estimated on these areas by a simulation model or direct measurement, depending on the carbon methodology. Another provider, Cloud Agronomics, proposes to [use](#) hyperspectral aerial imagery to eliminate the need for soil sampling. Their aircraft flies at 8k ft measuring a swath of farmland that is 1,500 m across. The company claims that the error of their method is less than 10% compared to manual soil testing.

The distribution of analysis methods for selected companies:



Only 2 companies have disclosed their revenue: Flurosar (since 2021 - Regrow) - **\$153k** in 2017, Deep Planet - **\$275.6k** in **Q1'2021**. As for funding, 8 out of 11 companies are known to have received investments from \$0.13m (Deep Planet) to \$254m (GreenCollar), the median is \$6.25m. The total sum of investments is \$311.42m.

Known total funding (in millions):



GreenCollar has received the most investments out of the top companies in 2020 and 2021 from [Kohlberg Kravis Roberts](#) (Sep'2021: [AUM](#) - \$459b) and [Ontario Teachers' Pension Plan](#) (Sep'2021: [AUM](#) - \$173m).

Recent developments of top-11 Australian companies:

- 3 companies have their own platforms: [Cloud Agronomics](#), [VineSignal](#) (Deep Planet focuses on viticulture), [FarmLab](#), the latter is also used by Precision Agriculture;
- for July 2020 GreenCollar has [secured](#) contracts to supply approximately 65m Australian Carbon Credit Units ([ACCU](#) issued represents one tonne of carbon dioxide equivalent (tCO₂-e) stored or avoided by a project) to be issued and delivered to the Emissions Reduction Fund. The Company is also an initiator of the development of a [Reef Credit Scheme](#), which enables a market-based solution for land managers to undertake projects to improve the water quality of the Great Barrier Reef in Australia;
- in December 2021 Regrow [undertook](#) a new licensing arrangement with [CSIRO](#), Australia's national science agency, which developed a carbon abatement calculator called [LOOC-C](#), which helps producers understand the environmental benefits of implementing sustainable practice changes on their farms. LOOC-C will be available for eligible producers through Regrow's FluroSense platform as part of the company measurement, reporting, and verification offering in Australia.

Current demand:

In 2021 Australian Government Technology Investment [released](#) the Low Emissions Technology Statement, which is released under the Technology Investment Roadmap. The roadmap is the cornerstone of [Australia's Long-Term Emissions Reduction Plan](#) to meet net-zero emissions by 2050.

The Australian government is the biggest buyer for ACCUs under the ERF scheme, but [demand](#) from private entities and financial institutions has surged and is likely to remain strong.

Soil carbon sequestration [was](#) one of the initial 5 priorities in the Australian government's emission reduction technology [roadmap](#), with over \$200m set aside in the 2021-22 Federal Budget to improve and protect Australia's soils.

Demand for new developments in the technology of SOC monitoring is directly linked to the high costs of traditional soil sampling and testing. The Australian Farm Institute [indicated](#) the costs for soil carbon projects as seen in the table below.

Project costs for soil carbon projects:

Item	Cost
General soil test	\$110 per sample
Leco soil carbon test	\$44 per sample
Initial accreditation	\$3000 (one-off cost)
Legal advice (contract)	\$2000 (one-off cost)
Annual statement preparation	\$1000 per year
Annual insurance	\$500 per year
Soil sampling	\$780 per day labor costs (operator collecting four samples per hour and working 6.5 hours per day) \$30 per sample

As of August 2021 in Australia soil sampling across a 1 ha farm can cost up to [\\$11](#). There are no subsidies and farmers or project developers have to bear these costs.

The prices for carbon soil testing of laboratories in Western, Southeast Australia, Tasmania, and New South Wales were analyzed. The price range is between \$9,45-47,23, with an average price of \$28,35 (GST not included), depending on the state and the laboratory that performs the testing ([1](#), [2](#), [3](#)).

According to the Technology Investment Roadmap for 2020, one of the [goals](#) to achieve low emissions technologies is to set soil carbon measurement under \$3 per ha per year.

In contrast to this, Simble Solutions, which employs satellite imagery analysis to determine soil carbon content, [prices](#) the subscription to their [CarbonView](#) platform in the range of \$71-179 per month.

As for the global market, since the U.S. has the largest market share of the carbon market, the prices for carbon soil testing of laboratories in several states: California, Utah, and Tennessee were analyzed. The price range is between \$4-60, with an average price of \$35, depending on the state and the laboratory that performs the testing ([1](#), [2](#), [3](#), [4](#)).

The impact of COVID-19:

With the continued global rise of COVID cases, many business enterprises and organizations have limited or completely shut down their operations during the COVID-induced lockdown. Also during this period, there was also a reduction in the availability of staff and workers on-site to maintain full productivity. These factors have prevented the application of the emission management software industry from developing, and consequently, the emission management software market has slowed down during the pandemic.

At the same time, increasing global focus toward creating more sustainable means of production was reflected in global carbon emission rates. According to the [study](#), published by International Energy Agency ([IEA](#)), approximately 31.5 gigatons of CO₂ was produced during 2020, this was a 5.8% decline (largest drop since World War II) - the decline in emissions of almost 2b tons of CO₂.

Additionally, with the introduction of quarantine measures further development of analysis techniques that can be executed remotely has become a priority. At the beginning of quarantine in 2020, several U.S.-based labs [have limited](#) testing of samples to those that are deemed priority or essential to agriculture. The usage of satellite imagery eliminates the need for personnel to physically travel to the fields to take measurements or collect samples and reduces contact.

Market players:

Global top-5 (full description):

- [Simple Solutions Limited](#) - an Australian public company (ASX:[SIS](#)), founded in 2009, has [24](#) employees. Simple develops a platform [CarbonView](#) for carbon calculation, which uses satellite images. The company declares that they have [48](#) customers;
- [IBM Corp](#) - an American company that was founded in 1911, has a total of [524k](#) employees. The company develops computer hardware and software as well as its platform [Carbon Performance Engine](#) to operationalize carbon accounting;
- [Engie Impact](#) - a [subsidiary](#) of an American company [Engie](#), that was founded in 2019 and has a staff of [1k](#) employees. In September 2021 Engie [launched](#) its carbon intelligence platform [Ellipse](#);
- [GreenStep Solutions](#) - a Canadian company that was founded in 2008 and employs [15](#) people. It develops a carbon software [EcoBase Solutions](#) that calculates emissions. The company has a division [GreenStep Sustainable Tourism](#) that provides assessments, programs, and certifications to help tourism destinations and businesses measure and improve their sustainability performance. The company declares that they have [3k](#) customers;
- [SAP SE](#) - a German company founded in 1972 with 121k employees. In June 2020 SAP [launched](#) its Carbon Footprint Analytics product, which delivers carbon emission insights for a company's products by plant, profit center, or cost center. Based on SAP S/4HANA, SAP Analytics Cloud and SAP Cloud Platform, the application delivers transparency on the carbon emissions of a product across the entire value chain, including production, raw materials, energy use, and transport. Producers can also integrate data from product databases and third-party solutions to analyze and understand the emissions breakdowns.

Australian top-5 by investment (full description):

- [GreenCollar](#) - an Australian company that was founded in 2008, has [83](#) employees. GreenCollar works with landowners to identify and develop land-based carbon projects, such as forest protection and land restoration at scale by using the method of soil sampling. Since 2020, the company has [received](#) \$254m in investments. The company [offers](#) a free assessment of carbon potential;
- [Regrow \(ex-Flurosat\)](#) - an American company, founded in 2016, that employs [60](#) people. Provides the platform for precision agriculture where carbon measurement via satellite imagery is available. Regrow was formed in February 2021 after the [merger](#) of Australian Flurosat and Dagan, a U.S. company. Since 2017, the company has [received](#) \$25.6m investments;
- [Hummingbird technologies](#) - a British company founded in 2015, and has [67](#) employees. The company analyzes remote sensing data to help farmers identify early problems in their crops such as crop health, disease risk & detection, weed mapping, and yield prediction as well as canopy coverage, plant counting, size, and biomass estimation, with the objective of optimizing inputs and maximizing efficiency by using the method of satellite imagery. Since 2016, the company has [received](#) \$17.6m in investments. The company declares that they have ~100 customers and 54.8 ha surveyed;
- [Cloud Agronomics](#) - the company was founded in 2018 in the U.S., has [16](#) employees. Cloud Agronomics uses hyperspectral aerial imagery to measure carbon in the soil. They are focused on the U.S., but there is a head of Australia according to their website. An Australian entity was [registered](#) in December 2021. Since 2019, the company has [received](#) \$6.5m investments;
- [Carbon Sync](#) - the company was founded in 2017 in Australia, has [5](#) employees. Carbon Sync provides carbon project development: takes base soil samples, develops a project and registers it with the Clean Energy Regulator ([CER](#)). Since 2020, the company has [received](#) \$6m in investments.

M&A trends:

In 2020 [Royal Dutch Shell Australia](#) bought [Select Carbon](#) as it seeks to reduce its emissions and expand its low-carbon and renewable energy business. The value of the deal was not disclosed. This is not the first purchase in the Australian energy sector of Shell - in November 2019 the company [bought ERM Power](#) for \$441m (now Shell Energy Australia), [February 2022](#) - an online electricity retailer [Powershop Australia](#). Shell's [target](#) is to become a net-zero emissions energy business by 2050 according to the UN Paris Agreement on climate change.

In 2021 Australian crop science company FluroSat acquired the U.S.-based soil health startup Dagan and [created](#) a new company, Regrow. To date, Regrow's total [funding](#) is \$25.6m, of which FluroSat previously raised \$8.6m in equity and grant funding led by Microsoft's M12 venture capital fund.

In July 2021 Carbon Syn [announced](#) a collaboration with [ScanWorld](#) to develop prototype products that assist soil carbon monitoring.

Regulation:

The main regulator of carbon footprint policy is the CER - Australian independent statutory authority responsible for:

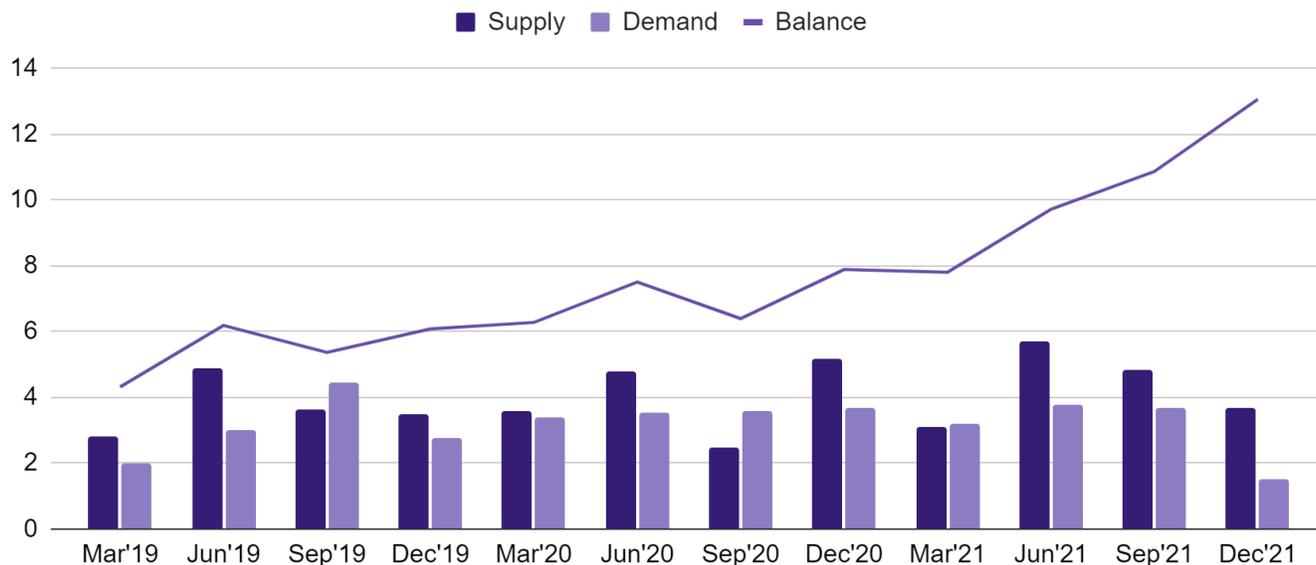
- developing the technical rules (methods);
- making emissions reduction purchases on behalf of the Government;
- administering the Emissions Reduction Fund (ERF).

If an Australian company wants to reduce the number of greenhouse gasses they produce and take actions that save carbon, then CER, through its ERF fund, offers to earn ACCU for every tonne of emissions reduced or saved by the project. Businesses may sell ACCU for income to the Australian Government through an auction and/or to other businesses.

It is not necessary to secure a contract with the Regulator to participate in the ERF. A business can register its project and commence earning ACCUs without bidding at an auction or decide to start their projects and participate in an auction later.

According to the latest quarterly report published by CER, a supply of 4.8m ACCUs was added to Australian National Registry of Emissions Units ([ANREU](#)) accounts during Q3 2021, while the total demand from ERF contract deliveries and voluntary cancellations totaled 3.7m units. The balance of ACCUs held in the ANREU increased for the second consecutive quarter to a record 10.9m units, up 12% on the 9.7m ACCUs held at the end of Q2 2021. The total amounts of supply and demand of ACCUs throughout 2019-2021 can be seen on the graph below.

ACCU supply and demand balance (in millions), by quarter, 2019 to 2021:



In July 2021 the ACCU price grew to a record high of [\\$22.00/t](#), and the price is [tipped](#) to jump to \$50 by 2030. [According](#) to CER, supply from registered projects has increased significantly from 15.4m total ACCUs issued by the end 2014-15, to 68.8m ACCUs by 30 September 2019. Total ACCUs issued in 2018-19 (13.7m) was 1.5m higher compared to 2017-18 (12.2m). This is the highest level of ACCU issuances in a financial year to date.

RESTRICTED USE WARNING

Full text

Summary

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This review was composed using the proprietary research process developed and employed by Moljar. Initially, research is conducted on social media websites and in news articles available online. Representatives of Moljar then identify main countries of business activities for the target and search the government public record websites for those jurisdictions such as business entity register, property ownership, court records etc. Next, the closest associates of the target are reviewed. In addition to providing a comprehensive description, Moljar is focused on finding possible sources of negative information, weak points and drawbacks. These can be used during business negotiations, M&A deals, candidate screening for employment to executive positions etc.

We search for information in various online sources, double-check it and summarize it for you to use in your business to check partners, employees or contractors.

Moljar has a HUMINT department that conducts anonymous interviews to supplement the online sources with data provided exclusively to us by people with first-hand knowledge of the matter.

Sometimes we use information provided to us by anonymous consultants.

If the target is a person, the aforementioned sources may include but are not limited to: associated court cases, arrests and accusations; affiliations such as family, friends or business partners; income sources, assets and involvement in corruption scandals; publicly announced plans that were not executed; rumors, information deleted from social network profiles, message history; political and religious views, prejudice towards select groups of people; hobbies and habits; health problems; childhood activities; sexual preferences, marital history, committed adulteries etc.

A comprehensive list of sources we use to get you the full information on a person.

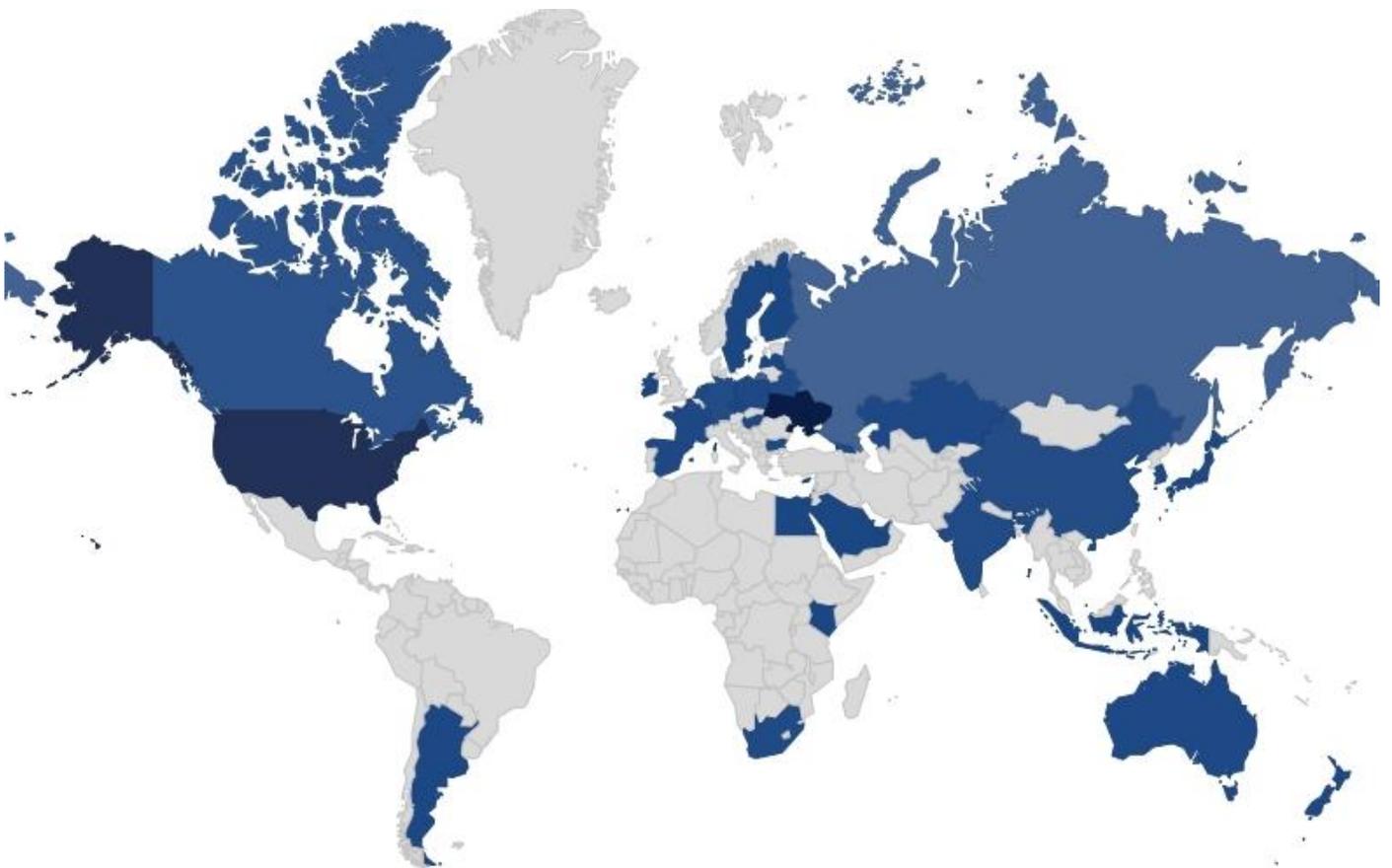
For corporate organizations the sources are identified as: involvement in litigation and/or contract compliance difficulties; staff reductions, departure of executives, questionable new hires; employee feedback, elements of corporate culture; discrepancies in announced plans and their results; major business model changes; funding sources: M&A deals, lines of credit, transfer of intellectual property rights; corporate plagiarism etc

The sources we refer to in order to complete a company's profile.

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Our areas of expertise



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