CLIMATE TECH

AN OVERVIEW

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Climate change used to be a distant theoretical concern.

Not anymore.

From the historic heat wave in Europe[1] to the wildfires in Australia[2] and California[3], climate change is behind some extreme events with major impacts.

Not only are the past seven years on track to be the warmest on record[4], but global sea-level rise reached a new high in 2021, with continued ocean warming and acidification.

The need for robust climate action is now more pressing.

Consumers are worried about climate change. 69% have changed their product and service choices due to climate change concerns[5].

Governments are devoting some serious work and resources to the fight against climate change. Together with intergovernmental organizations, governments are among the most significant funders of climate action[6].

Corporations are playing a bigger role in the fight against climate change. Hundreds of the world's largest companies are committing to bringing their net emissions to zero[7] and some have already begun to adjust and remodel their operations accordingly. Whether they will all follow through with their commitments remains to be seen.

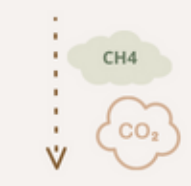
But we can't talk about climate change action and the fight for a sustainable world without talking about climate tech. These new or improved technologies are helping combat climate change, but what exactly are they, how do they work, and what does the future hold?

What Is Climate Tech?

Climate tech encompasses the various technologies focused on reducing greenhouse gas (GHG) emissions, addressing the impacts of global warming and increasing climate resilience.

The term climate tech is purposefully all-embracing to accommodate the wide range of innovations and technologies being used to lower GHG emissions and the many industries in which the tech is being applied.

Yet, despite being a broad term, climate tech applications can be grouped into three groups:



Group 1: Technologies and innovations that **directly reduce or eliminate GHG emissions.**

Group 2: Technologies and innovations that **help us adapt to climate change impacts.**

Group 3: Technologies and innovations that **improve our understanding of the climate**.

These three groups essentially highlight the benefits of climate tech. However, the tech also provides another benefit that may not be obvious at first glance — the ability to monitor and track progress.

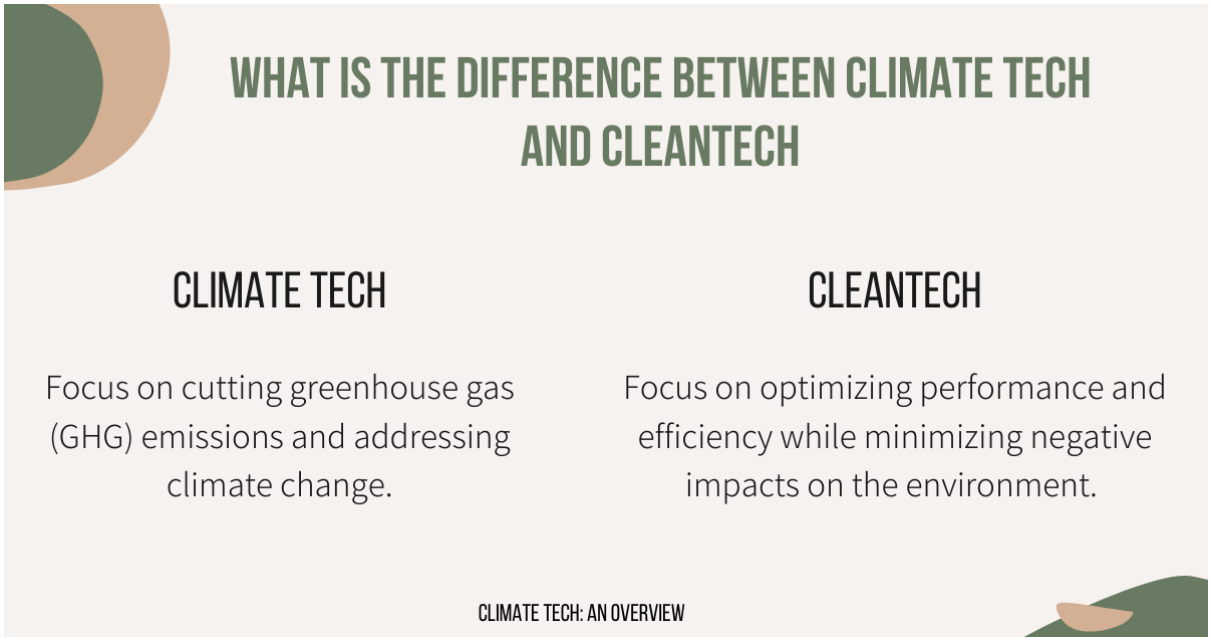
People can create climate action plans and set climate targets, but they still need to quantify, reduce and monitor emissions. The process of bringing these three elements together is complex, error-prone, and time-consuming.

Enter climate tech.

The technology can simplify the process, making it more transparent, efficient and effective.

What Is The Difference Between Cleantech And Climate Tech?

Although people often use them interchangeably, these two terms aren't synonymous.



Cleantech focuses on technologies and business models that increase productivity, efficiency and performance to minimize or eliminate any negative environmental impacts.

Put another way, cleantech reduces environmental impacts through more sustainable use of materials, energy efficiency, and other environmental protection action.

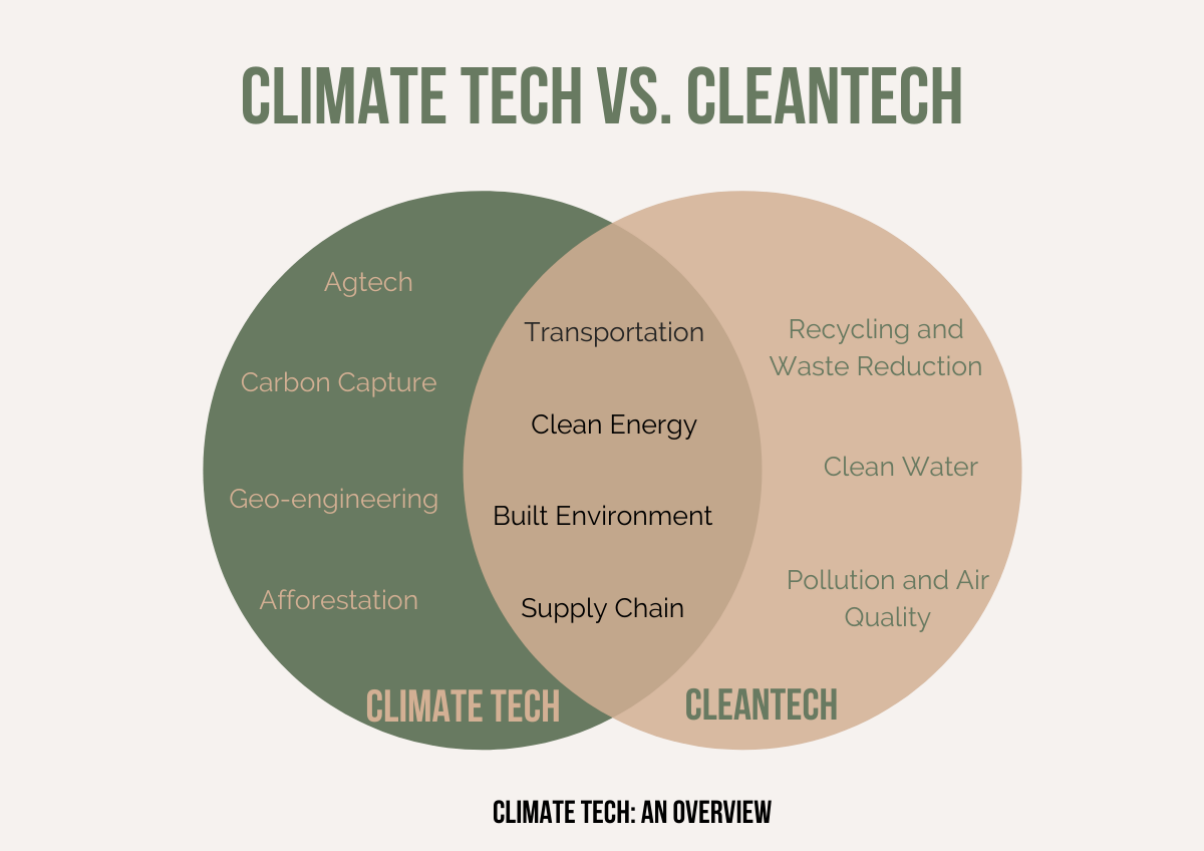
Its applications include clean air and clean energy, waste reduction and recycling, the built environment, transportation, manufacturing, and supply chain improvement.

On the other hand, the climate tech ecosystem comprises solutions that specifically address climate change and reduce GHG emissions. The focus is mainly on mitigating the drivers and impacts of GHG emissions (i.e. climate change).

Take technology that addresses the issue of clean drinking water, for example. Even though this tech falls under cleantech, it wouldn't be considered climate tech because clean water does not, by itself, actively reduce GHG emissions.

Conversely, agtech falls under climate tech rather than cleantech. Agtech solutions focus on developing more efficient, precise and less harmful food production methods that provide significant opportunities for methane reduction and carbon sequestration, both of which help mitigate the effects of GHG emissions. Minimizing impact on the environment is a secondary, albeit still important, benefit.

Still, there's a reason why people often use climate tech and cleantech interchangeably.



There's a big overlap when it comes to areas covered under each term. For instance, clean energy, the built environment, and transportation fall under cleantech, but they also fall under climate tech:

- Clean energy focuses on reducing reliance on fossil fuels that produce greenhouse gases.
- Climate tech in the built environment sector focuses on innovative building materials and improved energy efficiencies that can reduce building energy consumption, and ultimately, GHG emissions.
- Transportation is one of the top GHG emitters globally, and climate tech aims to curb this problem.

In light of this, let's have a look at some real-life examples of the applications of climate tech.

Examples Of Applications Of Climate Tech

Carbon offsetting

Although they cannot replace the need to reduce GHG emissions and phase out fossil fuels, carbon offsets can still help address climate change and promote the use of renewables.

Brand Example: Klima[8]
Solution: Helping people go carbon neutral sustainably by allowing them to make measurable climate action.

Solution Overview: Klima's climate app calculates a person's carbon footprint, then, with the subscription fee, supports verified climate projects that remove or reduce emissions. The app also gives users tips on promoting climate health.

Circular economy

By eliminating waste and pollution, circular economy actions reduce the emissions associated with the production of the materials that go to waste. A switch to a circular economy could ease pressure on virgin materials by 28% and cut GHG emissions by 39%[9].

Brand Example: Refurbed[10]
Solution: Giving people access to highly price-competitive refurbished electronic products that look and function like new products.

Solution Overview: With over 130 refurbishers, the company is promoting the circular economy — reducing electronic good waste, which is often harmful to the environment.

Built environment

Buildings contribute nearly 40% of annual global CO_2 emissions. Building operations generate 28% of the emissions and 11% are from construction and building materials[11].

Brand Example: Metrikus[12]
Solution: Smart building platform for reducing the carbon footprint of building operations.

Solution Overview: Metrikus software analyzes building use, e.g., through energy and indoor air quality monitoring. The software then gives building owners and occupiers insights that help them increase efficiency and improve sustainability.

Food systems

Food production contributes close to 37% of GHG emissions. Furthermore, animal-based foods produce nearly twice the emissions of plant-based foods[13].

Brand Example: Gourmey[14]
Solution: Cultivated meat that reduces dependency on climate-intensive products.

Solution Overview: Gourmey produces lab-grown meat from animal cells, allowing people to enjoy meat without sacrificing planet health. The startup started with cultivated foie gras and now hopes to mass-produce chicken and duck meat products since poultry is the planet's most-consumed meat. The company is also aiming to use a premium distribution strategy to sell its cultivated meat to high-end restaurants.

Financial services

Interest in responsible investing is growing, but the climate impact of ESG funds is not always as good as the marketing may suggest[15]. It's important to improve the flow of money towards companies that are improving the environment while cutting funding for companies that are simply involved in greenwashing gimmicks.

Brand Example: Carbon Equity[16]
Solution: High impact investing that makes it easy for people to invest in climate funds.

Solution Overview: Carbon Equity lowers barriers to private market investing. It aggregates individual tickets to reach the high investment thresholds of top-tier climate funds that have passed a strict climate impact and performance assessment. The startup plans to make investing even more accessible in the future by further reducing the ticket size.

Solutions like Carbon Equity will help make investment more available to climate tech innovations.

Climate risk quantifying

Managing climate risk is key to reducing the risks associated with climate-related hazards, helping to protect the environment as well as people and their livelihoods.

Brand Example: Cervest[17]
Solution: AI-powered climate intelligence platform that allows organizations to quantify climate risk.

Solution Overview: Cervest is ushering in a new era of climate intelligence through machine learning and statistical science. The company gathers data and provides insights on climate risks to assets. What's more, the data spans multiple decades.

EarthScan, its first product, gives governments, enterprises, and NGOs on-demand climate intelligence to make decisions and improve asset resilience. For example, the product can

show the impact of extreme temperatures, droughts and flooding on assets using data that goes back five decades and looks eight decades into the future.

Similarly, asset managers and banks can use EarthCap™, another one of the company's products, to integrate climate modeling research into decision making.

Clean energy generation

While manufacturing and recycling solar power systems produce some GHG emissions, solar is a better energy source compared to conventional fossil fuel energy sources since it produces less life-cycle GHG emissions.

Brand Example: Zolar[18]
Solution: Solar power systems.

Solution Overview: Zolar serves as a single resource for everything people need to install solar power systems. The company's services encompass everything from planning to system installation. Zolar also aims to make solar power system installation accessible to all by allowing customers to rent solar systems, thereby eliminating high up-front costs.

Mobility and transport

The global transportation sector is one of the largest contributors to GHG emissions. Medium and heavy trucks account for 22% of transportation CO_2 emissions, making them the second-largest polluters in the sector after passenger cars[19].

Trucks produce close to half the emissions of passenger cars. Nevertheless, when you consider that there are significantly fewer trucks than cars on the road, you can see just how polluting the trucks are.

Brand Example: Volta Trucks[20]
Solution: Sustainable last-mile logistics.

Solution Overview: The electric vehicle manufacturer is redesigning and electrifying large cargo vehicles used for middle- and last-mile delivery in urban centers. By so doing, the company is eliminating the harmful pollution that causes local air quality problems and climate change.

The applications of climate tech solutions are on the rise.

What are the implications of this growth and what is the climate tech sector's outlook?

The Future Of Climate Tech

Investment in climate tech is booming.

PE and VC investment reached $87.5 billion in 2021, according to a report from PWC[21].

The future looks promising, but there are some lessons to be learned from the past.

A Look At History

A lot of investors will know that it's nearly a decade since what is perhaps one of the worst boom-and-bust cycles in the history of tech investing.

As climate tech gains momentum, many people still remember how cleantech VCs lost their money[22] after over 90% of the startups funded between 2006 and 2011 failed to generate any ROI[23].

Are things any different this time around?

The simple answer is yes, and this is why.

What's Different Now?

The first thing is something alluded to earlier — individuals, companies and governments are taking climate change a lot more seriously today than they did ten years ago. People are ready to support business models that can make a change.

The second is that renewables are now price-competitive with fossil fuels, consequently leveling the playing field a bit more and setting the stage for a global transition to clean energy systems. This shift is creating more market opportunities for businesses that can capitalize on the emerging renewables economy.

Another thing is that many of today's most promising climate tech startups are focusing on software.

The majority of the companies that dominated the first cleantech era did not benefit from the software business model. Think battery, solar panel, biofuel, and electric vehicle startups.

A lot of the startups had to invest a lot of years in product development and they also had to develop large-scale manufacturing strategies, often before determining if their product was commercially viable.

Take Solyndra, for example. The promising startup failed to scale solar module manufacturing in a cost-effective way[24]. Similar to many of the startups at the time, Solyndra was highly capital-intensive, plus it had long and uncertain tech development timelines with not-so-robust unit economics.

The result?

Solyndra shut down and investors lost close to $2 billion.

But something else emerged amid the chaos. The few startups that did survive the previous cleantech era (e.g., Tesla[25] and Nest) had something in common; they were software-centric.

It's companies like these that make up a large proportion of the current climate tech landscape. The startups — for instance, those in the precision agriculture sector — are applying software and machine learning in the fight against climate change.

But There's Still A lot Of Work To Be Done

The climate tech space is looking favorable. Creating viable solutions still requires a lot of work though.

Funding is still one of the big issues as highlighted by the PWC report.

1. Investment in climate tech has become largely stagnant. Of the 15 solutions analyzed in the report, the top five (which make up over 80% of emissions reduction potential by 2050), got just 25% of the climate tech investment between 2013 and 2021.

2. The investment that has been disbursed to date has mainly gone towards tech solutions that account for only 20% of the overall emissions reduction potential.

3. The companies tackling the big emitters are not necessarily attracting the most funding. For example, the built environment contributes over 20% of GHG emissions, but it has received only 4% of climate VC investments.

There's a need for significant and sustained investment in solutions and technologies that will have a more direct impact on GHG emissions.

Additionally, it's been suggested that close to 50% of global CO_2 emissions reductions by 2050 will stem from technologies that are currently in the development or prototype phase. Sustained investment will help accelerate R&D and ensure that the solutions are commercially ready in the near future.

Conclusion

Climate tech is not the answer. It won't miraculously solve all our climate problems on its own.

Nonetheless, it's an enabler. It's one of the tools that will:

- Help us curb emissions
- Put us on track to achieve our climate goals
- Help us transform climate challenges into economic growth opportunities.

Granted, more funding is required across all challenge areas, but the climate tech industry is growing and we'll likely see breakthrough innovations and technologies over the next decade and beyond.

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