

Capturing business opportunities arising from climate change

New business models emerge in anticipation of the impacts of climate change



Climate change is certainly no longer a novel topic and much has been said about its impacts and strategies for mitigation. In this Viewpoint, we focus on how corporates can anticipate the impacts on their business and provide perspectives on how new business models can be envisioned with climate change adaptation in mind to ensure sustainable long-term growth.

The importance of adaptation for corporates

Discourse around climate change today typically centers on mitigation. Mitigation concerns solutions that reduce or even eliminate the causes or impacts of climate change. Although mitigation is rightly a priority in climate change approaches, adaptation is equally important, yet somehow receives less attention. Adaptation solutions assume the inevitability of climate change and make suitable adjustments in response. As such, they provide major opportunities for business by anticipating the changing landscape and developing new business models.

According to some estimates, corporates have the potential to capture US \$26 trillion in opportunities and create 65 million new jobs by 2030 through climate change adaptation. (Source: Inc.) In this Viewpoint, we look at different pathways and business model categories that corporates can consider. We focus on climate change but the same principles around rethinking business models can be applied to other sustainability domains, such as water, air pollution, and food.

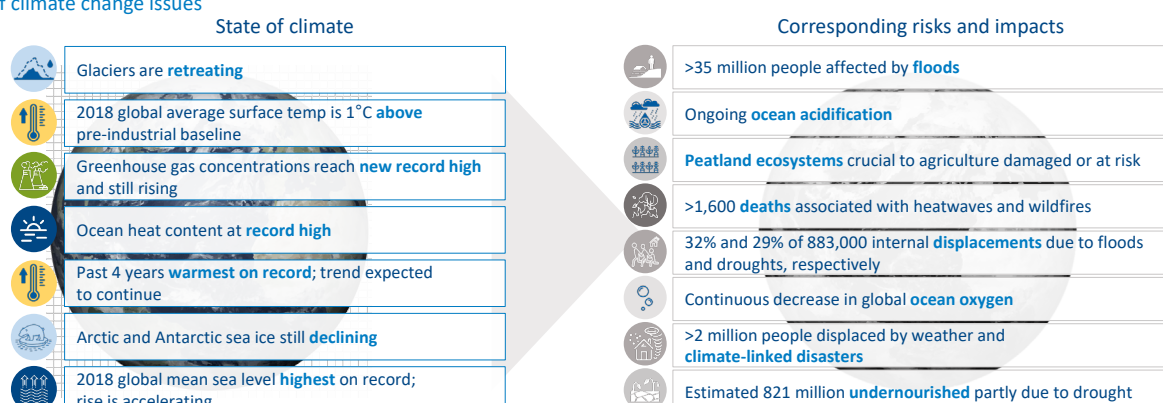
Climate change business gains traction

The case for climate change solutions has never been more urgent given the scale of adverse impacts of human activity on the environment today (see figure below). Growing public concern and major advances in clean technology are leading the way toward new expectations and better responses for tackling climate change in both the public and private sectors.

Regions and countries across the world are rapidly launching initiatives and policies. The European Green Deal, for example, launched in 2019 included several ambitious actions, ranging from achieving net zero emissions by 2050 to accelerating the shift to sustainable and smart mobility. Moreover, US President Joseph Biden has recently recommitted the US to the Paris Agreement through a \$2 trillion plan to fight global warming and reduce carbon emission by 50% in 2030.

In the private sector, corporates are becoming more active in addressing climate change challenges as well through their

Urgency of climate change issues



business activities. This trend is driven not only by corporate responsibility but also by the economic potential of exploiting these challenges for differentiation and long-term value creation.

We have screened more than 200 companies, both startups and established businesses, that have devised new offerings to adapt to climate change issues. Through this evaluation, we have seen an increasing trend of new players innovating to capture new business opportunities as part of climate change adaptation.

Climate-related business opportunities

We can split climate change adaptation opportunities into three types of business (see figure below):

- Climate diagnostic businesses** – collect/use climate change and weather data to support companies and governments in decision-making processes or business-as-usual activities. Typical businesses in this area could be news agencies, specialized consulting companies, and software-as-a-service (SaaS) providers.
- Resilience solution businesses** – offer solutions to prevent abrupt shock or provide compensation for the adverse impacts caused by climate change. As climate and weather data are required inputs for this business domain, businesses in this category include insurance, security, and disaster response as well as those that fall under climate diagnostic.
- Climate response businesses** – address new needs or opportunities generated as a result of climate change. This could refer to new goods and services, new revenue structures, or even new disruptive business models.

Next we describe each category and provide examples of business models and pioneering industry players.

Three potential climate change business types

	Climate diagnostic business	Resilience solution business	Climate response business
Overview	<ul style="list-style-type: none"> Using daily weather data to improve customer sales and reduce costs Effectively promoting digital transformation for customers 	<ul style="list-style-type: none"> Prevention of sudden changes/compensation for damages caused by climate change Accuracy of data analysis is key 	<ul style="list-style-type: none"> Responding to aftermath/long-term impacts of gradual climate change Data is important
Example companies	<ul style="list-style-type: none"> Weathernews, Japan Weather Association 	<ul style="list-style-type: none"> Opti, Understory, Dispatchr 	<ul style="list-style-type: none"> IDE Technologies, Blue Frontiers, Insect Shield
Key customers	<ul style="list-style-type: none"> B2B: retail, agriculture, logistics, construction, etc. B2G: government, etc. 	<ul style="list-style-type: none"> B2C: people in danger of heatstroke, etc. B2B: construction, agriculture, manufacturing, insurance, etc. B2G: government, etc. 	<ul style="list-style-type: none"> Multiple industries: mines, agriculture, fisheries, maritime transport, etc.
Monetization model	<ul style="list-style-type: none"> Fee for providing analysis information Consulting fees SaaS business 	<ul style="list-style-type: none"> Similar to climate diagnostic Insurance and security Implementation of disaster response services 	<ul style="list-style-type: none"> Depends on type of service/product

Source: Arthur D. Little analysis

1 – Climate diagnostic business

There are four main types of players in this category based on how they handle data:

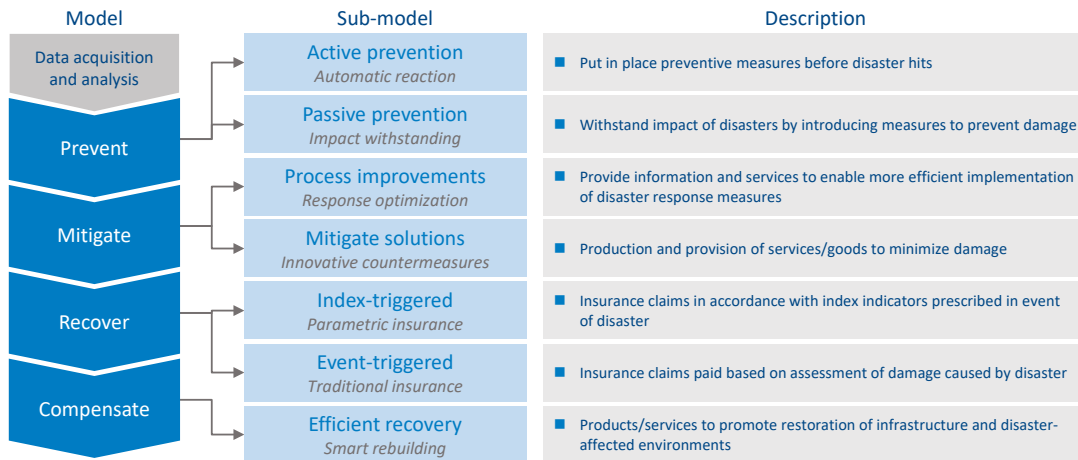
- Collect data** – players that sell climate and weather data or information. Such companies obtain diverse specific data from proprietary or other sources and monetize it through selling. Startups such as Saildrone, VanderSat, and Ambee have actively embraced this model.
- Provide data** – players that make analyses and forecasts based on obtained data. Monetization is through selling forecasts and generating advertising revenue. One example is weather forecasting apps and websites with freemium and/or advertising revenue models, such as Ubimet, a global leader in meteorological forecast services with products designed for insurance, transport, and other sectors. Another source of revenue is from sales of weather monitoring hardware and software.
- Analyze data** – players that provide advanced analysis based on specialized information. Monetization occurs through selling analytical insights and/or consulting services. A good example is aWhere, a US-based company specializing in providing real-time weather data and crop optimization recommendations. Its products have been used in forecasting and anticipating the impacts of weather variability in South Africa and monsoons in India, as well as crop planning in Ghana and Kenya, among many others.
- Utilize data** – players that monetize climate data by providing products, services, and platforms built on data analytics. These companies sell business-to-consumer (B2C) risk analysis services and reports and provide services based on weather information to improve the environment for consumers.

Climate diagnostic businesses exhibit some hallmark characteristics: (1) they manipulate or utilize data as a core offering to customers; (2) sales are typically B2C or business-to-government (B2G); and (3) they rely heavily on advanced digital technologies, such as artificial intelligence (AI), machine learning (ML), blockchain, and others, to optimize operational efficiency and deliver benefits to clients, such as convenience, accessibility and speed.

2 – Resilience solution business

Resilience solution businesses can be broadly divided into four categories: prevent, mitigate, recover, and compensate (see figure overleaf). Typical customers are governments, utilities, and infrastructure or manufacturing companies that cannot afford the risk of unplanned operational shutdowns. Resilience solution services may also be applicable to small commercial and domestic customers, especially in the recover and compensate domains.

Resilience solution business



Source: Arthur D. Little analysis

An interesting trend is the expansion of share of wallet through bundling with insurance instruments. Such business models offer a basic product or service (e.g., disaster risk assessment) and couple it with preventive measures, damage reduction, or restoration guarantees (in other words, insurance). The following examples illustrate the nature of different types of resilience solution business:

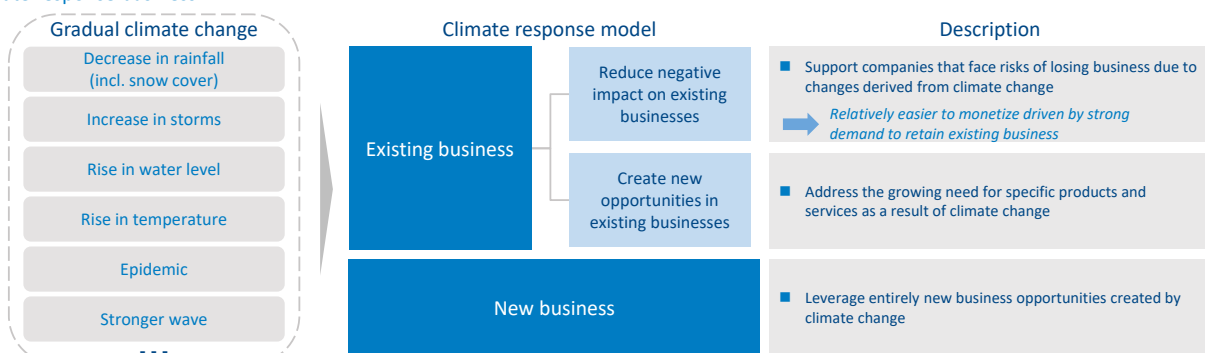
- Prevent** – Kawasaki Geological Engineering, a Japanese company, has utilized technologies such as analytic hierarchy process early warning systems along with other disaster anticipation technologies (e.g., helicopter laser measurement, satellite image processing, and other geomorphic analysis technologies) to preempt and predict floods or landslides.
- Mitigate** – Tractable, a UK-based startup, is an example of a process improvement business model. Tractable specializes in AI solutions to automatically conduct post-disaster damage assessments for insurers. Tractable can accurately assess damages and predict costs at scale, improving analysis and accelerating the claims appraisal experience for the customer.

- Recover** – Understory is a parametric insurance provider that primarily specializes in hail events for auto dealerships. Using Dot, a proprietary weather sensor, Understory can settle insurance claims based on the occurrence of certain weather triggers instead of having to process detailed damage assessments.
- Compensate** – Coral Vita created a for-profit ecosystem restoration business model, providing services to governments, tourism, and hospitality companies to rehabilitate coral reefs. By deploying cutting-edge cultivation methods, Coral Vita has commercialized restoration to address ocean acidification and degradation of natural coral reefs.

3 – Climate response business

Businesses that provide value through managing the aftermath of gradual climate change fall under the third category, climate response (see figure below). These businesses revolve around the maintenance of existing operations impacted by climate change, or the reinvention and creation of new business models. The latter is beyond the scope of this Viewpoint to explore, but one example is Arctic tourism, which to date is a costly and luxury affair out of reach for most tourists. Examples of response services for existing businesses include:

Climate response business



Source: Arthur D. Little analysis

- **Reduce negative impact on existing businesses** – TechnoAlpin has supported European and US ski resorts for years with the manufacturing of snow to extend the shortened ski season. Similar businesses could be identified in other industries, such as agriculture, forestry and fisheries, tourism, food, and energy.
- **Create new opportunities in existing businesses** – “X-as-a-service” business models are evolving rapidly to address changing customer needs as a result of climate change. For example, US-based Reliable Heating & Air offers “comfort-as-a-service” starting at \$49 per month, offering HVAC services and equipment with no up-front, repair, and maintenance costs.

Insight for the executive

Like any megatrend, climate change will inevitably bring about both opportunities for the leaders and challenges for the laggards. As the world focuses on mitigation activities, forward-thinking businesses will already be preparing for adaptation to ensure business resilience and capture new opportunities.

Corporates need to envision their role and place in a world affected by climate change. Categorizations such as the one outlined here can be useful as a starting point for rethinking strategy. For example, data-centric businesses may find their place in the climate diagnostic category, while traditional product retailers could evolve toward more service-based models in the resilience solution and climate response categories. Regardless of category, it is clear that many opportunities exist in the climate change adaptation landscape. Early movers will gain advantage by taking the lead on reinventing their business models.

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Arthur D. Little

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