

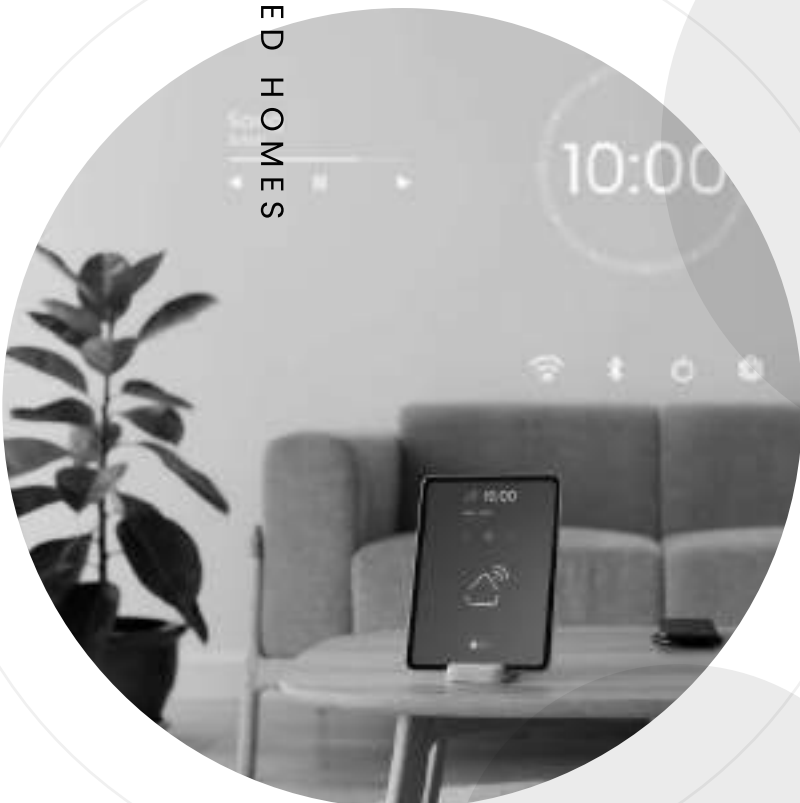
Climate and the Connected Home Ecosystem

How environmental insights can personalize the connected home experience

CLIMATE DATA



CONNECTED HOMES



Content

01	Executive summary
02	The connected home ecosystem
03	Understanding the connected home market
04	Climate's impact on the connected home ecosystem
05	Climate data as a problem-solving catalyst
06	The importance of reliable data in boosting further innovation
07	Conclusion

Executive summary

While consumers seek connected home solutions to enhance comfort, there is a growing sentiment that further personalization is needed to maximize both comfort and efficiency.

As more consumers buy connected home products to enhance comfort, the market evolves to uncover new challenges and solutions.

Climate becomes one such challenge which can also serve as the solution. Climate-aware connected homes have the potential to transform the way we experience and interact with our living spaces. In this whitepaper, we analyze the impact of the changing climate on the connected home ecosystem and present **three key trends** driving the case for integrating climate data into the connected home ecosystem.



Shifting consumer sentiment
towards sustainable choices



Rising health and safety concerns



The role of rising emissions from
devices

The connected home ecosystem

A connected home is an integration of devices, services, and applications that enables home automation to streamline tasks, personalize comfort and save energy and money.

Connected homes devices



HVAC
systems



Smart
thermostats



Smart air
purifiers



Connected home
controllers & apps



Connected
home hubs

Connected homes services



Maintenance
and repair



Data
management

Connected homes platforms



Smart homes
controller apps



Understanding the connected home market

Consumer adoption is at an all-time high

The dream of a connected home is rapidly becoming a reality. By 2025, an astonishing **21 billion devices** will be linked to the internet worldwide.

This increase in consumers adopting connected home devices can be explained by many factors, chief among them being convenience—these devices solve lifestyle challenges and enhance quality of life at the same time, making them an attractive offering.

With increasing disposable incomes and the advancing capabilities of AI and

32%

of Americans have purchased one or two connected devices.

13 and **21**

average number of device types and devices in an American household. ^[1]

[1] Deloitte connected consumer survey 2023

voice-assisted technologies, even previously price-sensitive demographics are showing interest in these devices, particularly in **emerging APAC** ^[2] markets where the allure of novel technology is a significant motivator.

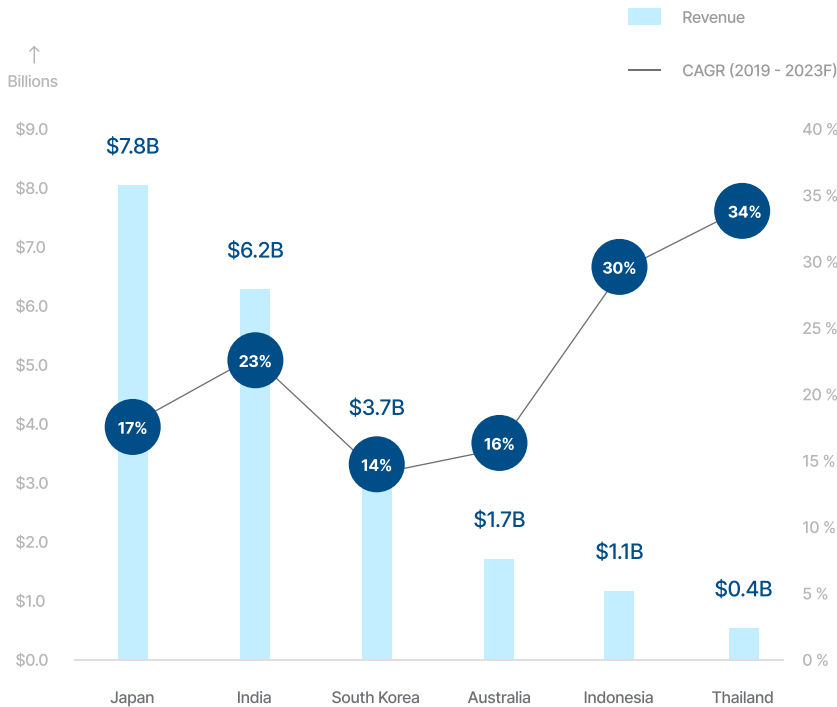


Fig 1 : Revenue and growth in the APAC devices market

In addition, the widespread availability of smartphones and internet connectivity, is fueling the demand for connected smart home products, as evidenced by substantial investments in fiber-to-the-home (FTTH) technology and expanding 5G coverage.

In light of these trends, one can expect growing numbers of smart-appliance users which can transform connected home devices from an innovation to a basic utility.

\$43 billion

The expected market value of connected devices in APAC in 2023.

€83.1 billion

The projected investment in FTTH technology from telcos by 2025.

[2] The Rise of the Connected Home in Asia Pacific 2020, Think with Google

However, reaching full potential depends on solving consumer pain points

Growing product adoption in this sector has reflected in significant YoY growth, especially in the North American region. Several estimates suggest that the market is projected to grow from roughly \$93.98 billion in 2023 to \$338.28 billion by 2030 at an approximate CAGR of 27.07%.

Despite the promising growth outlook, there are several challenges that market players must address to gain maximum growth. Numerous consumers [remain unfamiliar](#) ^[3] with the value propositions of connected devices, while early adopters struggle to get a truly seamless experience with their devices.

New offerings in the market are helping the industry relieve some of these pain points through emerging technologies, however, amidst the consumer challenges being solved, the effect of climate change is being overlooked.

\$14 trillion

Economic value added to the global economy through connected homes by 2023.

[3] McKinsey & Company, There's No Place Like A Connected Home



Climate's impact on the connected home ecosystem

The changing climate is also changing the connected home ecosystem in a substantial way. Increase in temperature ^[4], pollen count and severe weather events have altered what consumers expect out of their devices—both in terms of how it impacts the user and the environment at large. Here are the biggest climate challenges we have identified:

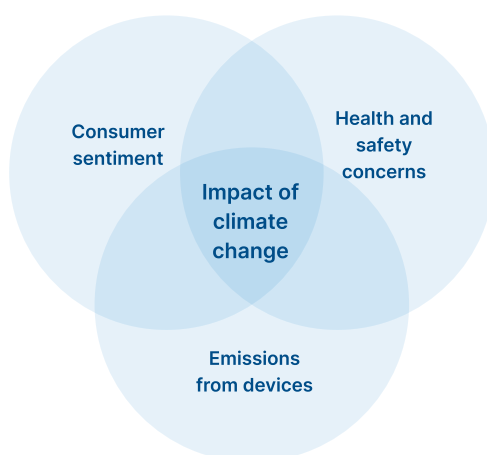


Fig 2 : Areas within the connected home ecosystem where the effects of climate change are pronounced

[4] NASA Earth observatory, World of change: Global Temperatures

1. Shifting consumer sentiment towards sustainable choices

Recent analyses have revealed the target demographic (millennials and GenZ)'s growing intention of making sustainable purchases — especially with their devices.

These cohorts express a strong desire for sustainable and eco-friendly devices which result in economic efficiency.

Energy saving potential plays a key role in the buyer journey

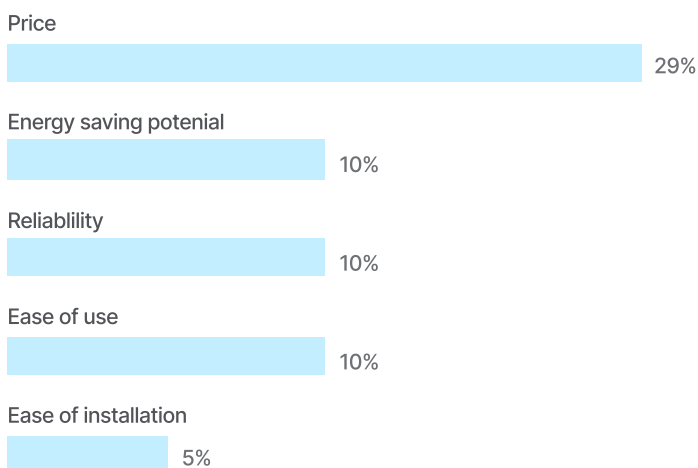


Fig 3 : Percentage of thermostat owners who listed trait as top three buying influence [3]

In addition to environmental impact, there is growing climate anxiety as a result of the increasingly changing environment.

Uncertain climate events like choking smoke clouds, heat waves, cold waves and high pollen counts has left the consumer in need of accurate information on how these events are affecting their health and well-being.

The [National Association of Realtors](#) reports that younger consumers prioritize energy conservation, consider heating and cooling costs, and look for other environment-friendly features before making a purchase.

[3] McKinsey & Company, There's No Place Like A Connected Home

2. Rising health and safety concerns

2023 broke temperature records worldwide. The upcoming years are already predicted to break temperature records, putting the 1.5 °C limit under jeopardy. These rising temperatures have exacerbated issues like air quality more than ever. On other hand, [pollen levels have increased](#) ^[5] – leading to a significant increase in cases of allergic rhinitis and asthma.

One of the major aspects in the future of connected homes is going to be the focus on indoor air quality and the well-being of occupants. Most present-day users are concerned about how these signs of climate change affect them and their loved ones in their daily life, this is a need that connected home solutions must look to fulfil. ^[6]

3. The role of rising emissions from devices

Emissions generated by connected devices is on an incline – especially in the landscape of rapid urbanization.

Consequently, efficient building management systems will play a significant role in achieving net zero emissions by 2050.

Many players in the connected home industry, including Samsung, have announced plans to create net-zero homes. Such initiatives are expected to become more common as companies strive to reach ambitious net-zero goals.

1/3rd

of global greenhouse gas emissions come from buildings. ^[7]

[5] Harvard T.H. Chan School of Public Health, Allergies are getting worse with climate change

[6] EY Future consumer index, 2023

[7] IEA, Energy systems, Buildings

A large portion of this responsibility falls under HVAC systems as they account for approximately 40% of a building's energy usage.

Despite progress HVAC systems are still far from energy efficient. Between 2017 and 2018 the energy intensity for space heating improved by 2%, and reduced for space cooling by 2.7% ^[8].

It is here where integrating climate solutions becomes a viable option. Emerging innovations in climate can assist players in the industry to make the best of the growing momentum and solve these challenges.



[8] Santamouris and Vasilakopoulou (2021)

Climate data as a problem-solving catalyst

Climate data acts as a way to solve these challenges and seamlessly fit into the connected home ecosystem . Going forward, data integrations opens up new ways of a significant catalyst for new ways of personalizing the connected home experience.

Climate data can help you adapt to the **shifting consumer behavior**

- Show real-time disaster alerts
- Give real-time forest fire alerts
- Recommend health suggestions based on ambient AQ and pollen

Climate data can help you protect **occupant health and safety**

- Optimize HVAC ventilation rates
- Regulate indoor temperature based on outdoor climate
- Enable predictive device maintenance

Climate data can help you **manage emissions** and achieve net zero goals.

- Create climate triggered workflows
- Recommend designated climate zones
- Display allergen and pollutant information

These applications are some of the many ways in which climate data can transform the status quo of connected home devices including HVAC equipment, thermostats, smart appliances and more. Doing so requires not just accurate data but data that can yield hyper-personalized insights and can integrate across systems.

The importance of reliable data in boosting further innovation

Amidst a changing climate, it's imperative for businesses to invest in climate-aware connected solutions to swiftly adapt to evolving consumer demands. Real-time information on temperature, humidity, air quality, and UV index improves the overall well-being of occupants, increasing their productivity and satisfaction.

For instance, integrating climate APIs like air quality and pollen in HVAC has multiple positive outcomes - reduced energy usage and improved occupant comfort through temperature and ventilation automation.



Air Quality



Pollen



Weather



Forest Fire



Natural Disaster

"In the past, construction of buildings was very sensitive to the weather, to the climate, to where the wind is blowing, and to what happens in winter and spring. Somehow over time this was lost because now all buildings are made from concrete: we have heating, air conditioning, and we do not really care about the weather outside. But in the past five to ten years, because we have sensors, we have moved back to a time when we can construct a building that is sensitive to what is happening outside. By making use of the weather elements, we are able to have buildings that are just as comfortable but at the same time have a much lower carbon footprint."

Kok Yam Tan
Former Deputy Secretary
of Smart Nation and
Digital Government Office,
Singapore

Conclusion

Climate change poses both a challenge and an opportunity for the connected homes industry. Integrating climate data with connected home devices can address climate mitigation and adaptation, offering innovative solutions for building climate resilience.

This whitepaper delved into the rise of connected homes and justified how climate change is impacting innovations in connected home products, driven by rising emissions, health concerns, and preferences for sustainable and eco-friendly living.

All of these factors converge at climate data, highlighting the importance of integrating climate data for next-generation connected homes to innovate around use cases that benefit both consumers and manufacturers.

To learn more about integrating climate data with connected homes, you can contact our experts at contactus@getambee.com or [schedule a call](#) with them.