

Smart Home Market Dynamics Report – 2021

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The Omdia logo consists of a stylized 'O' symbol followed by the word 'OMDIA' in a bold, sans-serif font. The 'O' symbol is a thick, curved line that forms a partial circle on the left side. The letters 'OMDIA' are in all caps and are positioned to the right of the 'O' symbol.

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Introduction

Scenarios and situational analysis

- This report assesses numerous smart home industry scenarios and presents alternate paths the smart industry may take based on device and industry trends. Unlike other smart home reports from Omdia, this report is mostly qualitative and hypothetical, with scenario-based forecasts through 2030 in the accompanying Excel workbook. Additionally, this report includes historical imports and exports (based on HS codes) for devices such as thermostats and door locks.
- In addition to trends-based scenarios, this report also assess the current and future impact of various smart home devices including long-term growth potential.
- The road to 2030 won't be a linear path for the smart home. This report aims to identify and explore the factors that could influence the final trajectory of the market.

Smart home scenarios

Four scenarios for broader smart home adoption



Smart home remains siloed

Market declines

- Matter continues to be delayed and has minimal impact for consumers. Implementation for B2B applications is fragmented.
- Home builders and apartment complexes limit installations of smart home tech.
- Due to privacy concerns, use of AI remains limited



Smart homes become actionable

Growth mostly flat

- Matter becomes ubiquitous, but brands do not focus on use cases and specific value propositions.
- Devices are no longer siloed but for full features, native apps are still required.
- Dashboards in the home provide additional insights about energy and water usage.



Smart homes are smarter and private

Low double-digit growth

- Consumers and B2B partners can buy any device, and it works with any platform without the need for a native app.
- Smart apartments are commonplace, and almost all new homes have basic smart home technology installed as a standard.
- Devices process mostly locally, voice assistants are embedded on more devices, NLP occurs locally, and security cameras are local with minimal cloud use.



Smart home becomes mainstream

High double-digit growth

- All homes combine device data and electrical and water usage as part of integration schemes with utilities to provide actionable intelligence.
- Radars replace analog sensors.
- AR and proactive digital assistants lead seamless integrations of devices in a household.
- AI and computer vision enhance user experiences and improvement in capability.
- Neighborhood-wide networks allow users to expand smart home/IoT technology beyond home.

Scenario 1: Smart home remains siloed

- In this scenario, the demand for and appeal of smart home technology begins to fade. Although high-end homes designed by the likes of Control4 and Crestron will continue to be opportunities for smart home brands, the mass-market desirability of these solutions will stagnate.
- This scenario could come to pass if a few mega trends are dismissed or delayed indefinitely. A few of these trends include Matter, adoption by adjacent industries, and AI.
- First, the implementation of Matter will be critical for the longevity of the smart home market. According to recent consumer surveys from Omdia, the biggest barriers to adoption are use cases and price point, not interoperability. In fact, confusion about how devices integrate was last on the list of why consumers have not purchased smart home technology. Nonetheless, Matter is crucial for the smart home market because it will theoretically allow brands to focus on use cases and integrations that will convince consumers of the value of smart homes. Moreover, Matter will facilitate new channels. Smart apartments and single-family home builders are two channels that should receive a boost from Matter because it removes smart home silos. This means, builders or property managers will be able to build smart home solutions with no concerns over ecosystem (Apple, Amazon, Google, etc.). However, if Matter is further delayed or the implementation does not meet expectations, then the value proposition of these new channels will be diminished.
- Second, adjacent channels will have a profound impact on the adoption of smart home technologies. More than 1 million single-family homes and multifamily housing units are built each year in the US alone. As these channels embrace smart home technology, that could equate to over 10 million device shipments annually for just these two channels in the US. Consequently, the importance of emerging channels cannot be overlooked, and if adjacent industries are not able to incorporate smart home devices, the market will be limited for all channels in the future, including retail.
- A continued rise in privacy concerns regarding AI in the home could have a negative impact on smart home technology. Today, most devices and platforms rely heavily on the cloud, meaning most of the processing is not done locally. If laws are put in place to reduce technologies such as facial recognition, audio analytics (smart speakers), outdoor cameras, etc., then this will negatively affect the future possibilities of the smart home market. While it's crucial for smart home brands to follow best practices for privacy and cybersecurity, overzealous standards and regulations could hinder future growth.

Scenario 2: Smart homes become actionable

- In this scenario, Matter is widely adopted by brands, but these brands keep advanced features behind paywalls or in native apps. This means that full features and functions of the devices require a dedicated app, going against the multi-admin and integration purpose of Matter. So, although devices can work with any platform, those features are often limited.
- Despite strong efforts, brands have not been able to create compelling use cases for smart home products. Although builders and property managers install smart home technology, mass adoption is not in the forecast for non-early adopters.
- Although the smart home market remains siloed, brands and service providers have embraced dashboards and partnerships, which allow utilities to provide better services to consumers. More specifically, programs such as time of use (TOU) and demand response become ubiquitous, and various pricing schemes can be created for consumers that enroll in programs to help with energy demand during peak times. Moreover, there will have been more complex integrations of solar, large appliances, and electric vehicle (EV) charging, which can reduce consumption but also qualifies users for federal rebates and subsidies.
- Overall, this scenario presents a vision of smart home solutions that have remained mostly siloed but have become more actionable for consumers. Rather than focusing on digital assistants, smart speakers, and security cameras, the home becomes more autonomous and AI driven, encompassing not only lighting and voice but dashboards for water, energy, and other use cases.

Scenario 3: Smart homes are smarter and private

- In this scenario, brands work more closely together, and use cases are the primary motivator for brands, not RMR of video cloud storage or revenue from advanced analytics. Also, devices work seamlessly across platforms, meaning a device with the Matter logo can work with Amazon, Google, Apple, SmartThings, etc.
- Because of the uptake of Matter, builders and property managers have fully embraced smart home technology, and there are a few newcomers as well, including insurance companies. For consumers, this means that smart home technology is unavoidable.
- To make smart homes more secure, many brands have started embracing locally driven AI and machine learning. This means security cameras rely less on the cloud, and smart speakers and digital assistants are embedded in more things, from the microwave and oven to the washing machine and clothes dryer. Natural language processing (NLP) has evolved to understand commands on device, with minimal requirement for cloud integrations.
- Owing to the rise of Matter devices, blockchain principles are used for onboarding, OTA updates, and the dismantling of products, reducing the effects of hackers.
- Overall, growth is 20–30% annually in this scenario as brands focus on use cases and benefits to consumers. In turn, this has led to more opportunities in new channels such as insurance. Moreover, the extensive use of local AI encourages more sensors in the home, driving better experiences for consumers.

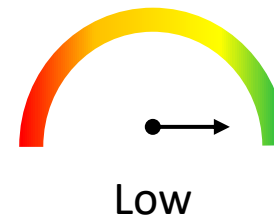
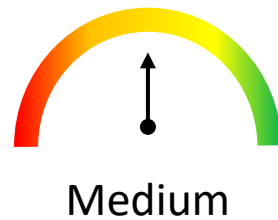
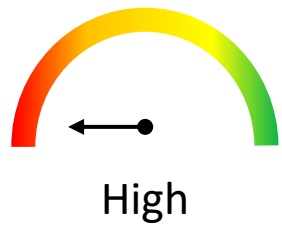
Scenario 4: Smart home becomes mainstream

- In this scenario, brands have excelled at integrating various use cases and pillars of the smart home, from security and energy to water and air quality. In addition, fewer sensors are needed in the home owing to the proliferation of radar-based technologies. This has led to more accurate smart home automations and generated new use cases for aging in place (senior care).
- Digital assistants are more proactive and have evolved to not require a wake word. Instead, various radars, computer vision, and audio analytics are used to determine whether a user is talking to a smart speaker/digital assistant versus someone else in a room.
- Robotics are introduced to the smart home, providing an enhanced experience compared to stationary devices, such as smart speakers. These robots serve multiple purposes, including companionship, as educators for kids, as security systems, or as healthcare associates that can monitor the wellbeing of the elderly or sick.
- Due to more analytics at the edge, computer vision, radars, and AI are embedded in more places around the home, such as the refrigerator, oven, and microwave or in bedrooms for accurate sleep tracking.
- Brands are also able to expand use cases by utilizing wireless technologies such as Amazon's Sidewalk and ultra-wide band (UWB). This allows consumers to do more while away from home and extends use cases for brands and service providers.
- Overall, this is the best-case scenario for the smart home market. It will require dedication and perseverance for brands and service providers that are compelled to create siloed ecosystems of proprietary devices and solutions. By emphasizing integrations, use cases, privacy, and security, the smart home has potential to reach the masses, evading the stigma of being a gimmick or toy.

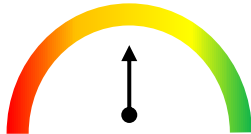
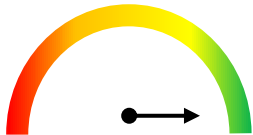
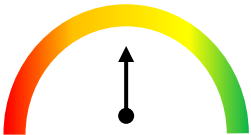
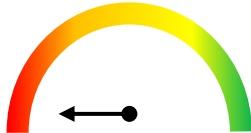
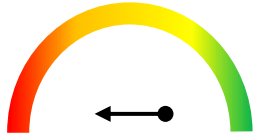
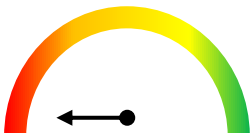
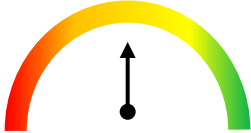
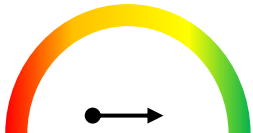
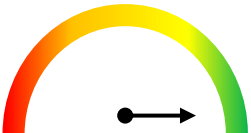
Smart home situational analysis – Trends

Impact of various smart home situations and trends

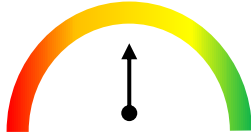
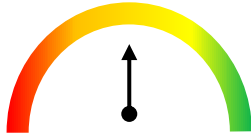
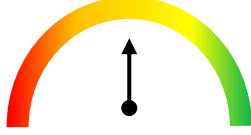
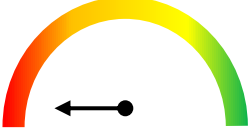
- **Seriousness:** The absolute impact (**high**, **medium**, **low**)
- **Urgency:** How quickly the issue needs to be addressed (**high**, **medium**, **low**)
- **Potential:** Whether the issue will be more significant in the future (**high**, **medium**, **low**)



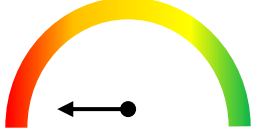
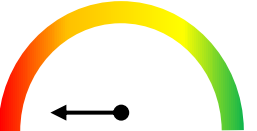
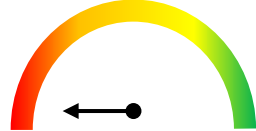
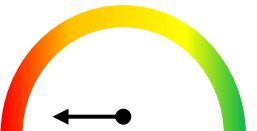
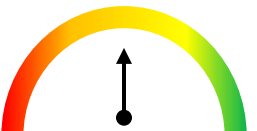
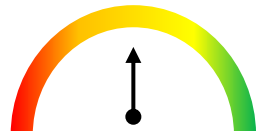
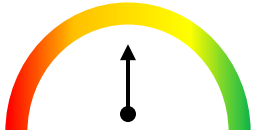
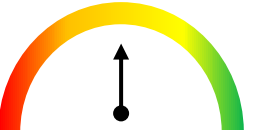
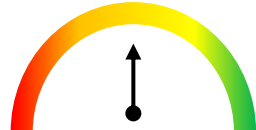
Smart home situations: Integrated assistants, edge-based solutions, and COVID-19

Issue	Description	Seriousness	Urgency	Potential	Remarks
Integrated digital assistants	More devices, such as appliances, have embedded and dedicated assistants for controlling features	 Medium	 Low	 Medium	Although smart home devices may get their own dedicated voice control, this won't replace multifunctional smart speakers.
Edge-based solutions	Less reliance on the cloud	 High	 High	 High	Although edge systems can improve privacy and security, these solutions will likely cost more (at least in the short term) and reduce RMR opportunities.
COVID-19	Impact from COVID-19 restrictions and purchasing trends	 Medium	 Low	 Low	COVID-19 had minimal impact on broader smart home. The pandemic sped up adoption by MDUs and adjacent industries. Consumers are likely to consider air quality and health products.

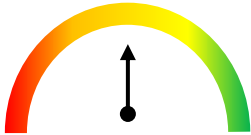
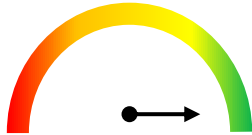
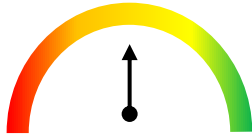
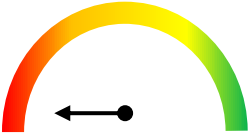
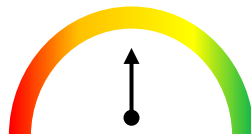
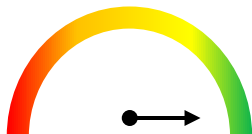
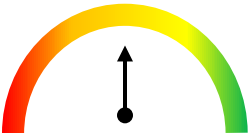
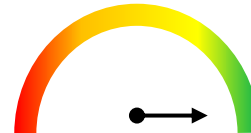
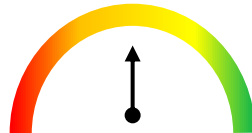
Smart home situations: 5G, DIY, and multi-modal solutions

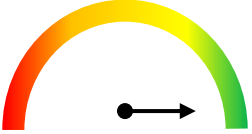
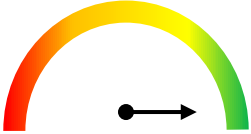
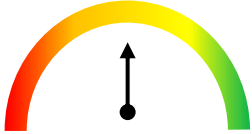
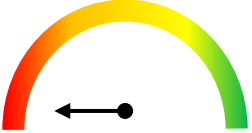
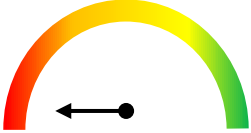
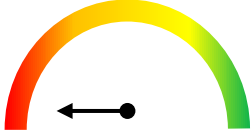
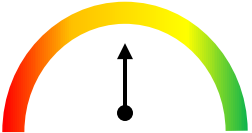
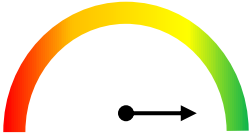
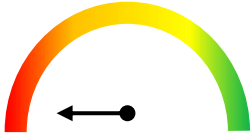
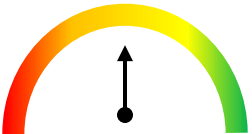
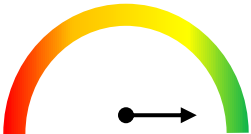
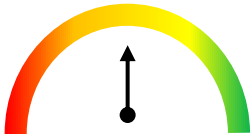
Issue	Description	Seriousness	Urgency	Potential	Remarks
5G	Faster speeds could prompt new devices and use cases	 Medium	 Low	 Low	Although 4K security cameras could benefit from 5G, other use cases are not obvious. For the smart home, 5G is a long-term trend at best.
DIY emergency response features	Brands including Amazon and Arlo release low-cost emergency response solutions	 Medium	 Low	 Medium	This trend has greater implications for professional security monitoring due to the ultra-low cost. While it may not replace a central monitoring station, these offerings are compelling.
Multi-modal, embedded solutions	Integrating multiple use cases into a single product	 Medium	 Medium	 High	Brands such as Masonite are looking to disrupt the door market by integrating multiple solutions into the door itself. Level Home introduced a game-changing dead bolt that is completely hidden.

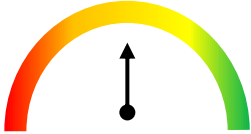
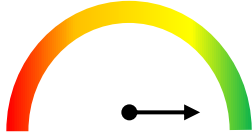
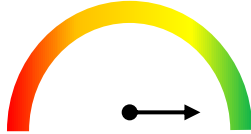
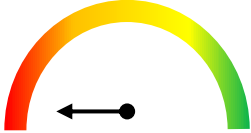
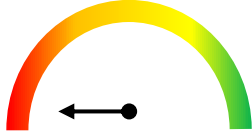
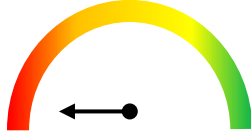
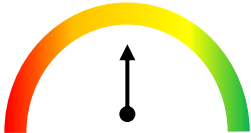
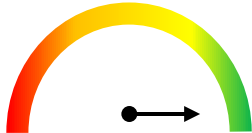
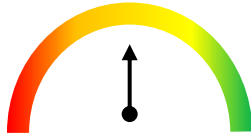
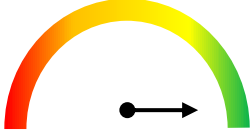
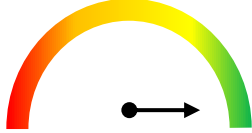
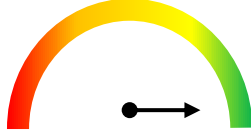
Smart home situations: Radars, wireless technologies, and AI

Issue	Description	Seriousness	Urgency	Potential	Remarks
Radar-based systems	Nearly unlimited use cases	 High	 High	 High	Although a potential privacy nightmare for consumers, radar-based systems have infinite opportunity, including sleep tracking, occupancy, and fall detection.
Wireless technologies	New wireless technologies like Sidewalk and existing tech like UWB and Thread	 High	 Medium	 Medium	Expanding smart home use cases beyond inside the home requires wireless technology such as Sidewalk. Thread will gain share due to Matter, and UWB has been proposed to supplement or replace Bluetooth in door locks.
AI and expanded pillars of professional security systems	Security solutions from the likes of ADT and Vivint are no longer just intruder systems	 Medium	 Medium	 Medium	Using AI to reduce false alarms is a relatively new trend. Although Alarm.com is not the first, with Ambient Insights, it is the latest example of using advanced tech to reduce false alarms and improve use experience. These platforms are also embracing broader use cases, such as water, energy, security, and air quality.

Smart home situations: MSOs, security devices, and outdoor technologies

Issue	Description	Seriousness	Urgency	Potential	Remarks
MSOs	MSOs like Comcast, Orange, and Deutsche Telekom continue to innovate around the smart home	 Medium	 Low	 Medium	Only a few MSOs have successfully deployed a smart home solution that integrates with the existing portfolio. Moreover, MSOs have been inconsistent with offerings, sending mixed signals to consumers.
Security devices as a crux of the smart home	Security devices such as cameras and intrusion sensors have been central to smart homes	 High	 Medium	 Low	Although security devices have been the anchor for smart home solutions, Omdia expects that consumers and brands will begin to gravitate towards novel use cases, with less reliance on security to drive and retain users.
Outdoor technologies	Complementing the inside of the home with outdoor accessories is a growing trend	 Medium	 Low	 Medium	With the introduction of Sidewalk and Apple's AirTags, opportunities outside of the home are expanding. Brands such as Ring and Philips Hue have also focused on moving beyond the interior of homes with outdoor lighting accessories. Nonetheless, this trend is regionally based.

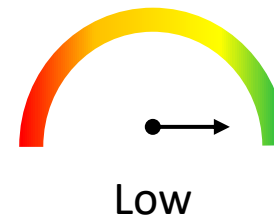
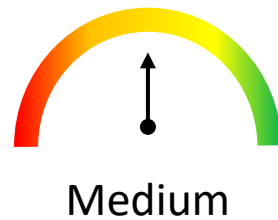
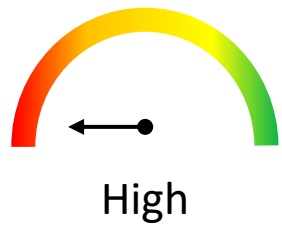
Issue	Description	Seriousness	Urgency	Potential	Remarks
Insurance companies	Insurance providers are in a unique position to provide smart home technology	 Low	 Low	 Medium	Despite interest and motivation from insurance companies, few providers have announced dedicated smart home platforms. While the focus would likely be on water leaks, security, and fire, the upfront cost to insurance companies and the impact on claims are barriers.
Smart apartments	Property managers, investors, and owners are beginning to embrace IoT	 High	 High	 High	Although mostly a North American trend as of mid-2021, there is untapped opportunity with apartment complexes. With more than 20 million existing apartments in the US, the long-term opportunity is with retrofits.
Aging in place (senior care)	Monitoring seniors at home has been an ongoing talking point, but adoption has been sparse	 Medium	 Low	 High	Although there are limited case studies for aging-in-place technologies deployed B2C, the market opportunity is vast. Omdia remains optimistic about the future of at-home senior care solutions.
Utilities	Using IoT to help manage grids is not a new trend, but the role of smart homes is becoming clearer	 Medium	 Low	 Medium	Though mostly a European trend as of mid-2021, utilities in Europe are highly-engaged and interested in offering independent smart home platforms and in some cases, ones fully integrated with energy generation and distribution.

Issue	Description	Seriousness	Urgency	Potential	Remarks
Retail	Online retail plus brick and mortar represent the biggest channel for the smart home	 Medium	 Low	 Low	The retail channel will represent more than 80% of worldwide smart home device shipments until at least 2025.
Home builders	New home construction should be a target for all smart home brands	 High	 High	 High	Globally, 26 million devices are forecast to be installed as part of new home construction in 2025, up from 1.7 million devices in 2020.
Tradesperson (HVAC specialist, plumbers)	Niche and highly variable based on region	 Medium	 Low	 Medium	Tradespeople working with HVAC and other home services are in a unique position to educate and persuade consumers. This channel is small, but the opportunity is nascent.
High-end specialist (Crestron, Control4)	Although this is incorporating more consumer and DIY brands, the opportunity is narrow	 Low	 Low	 Low	Despite the high cost of these custom installations, the number of devices installed per home is much higher relative to other channels. Omdia forecasts there will be about 41 million smart home devices installed globally through this channel.

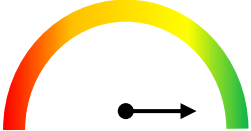
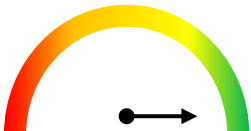
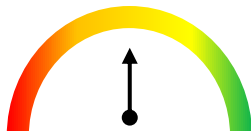
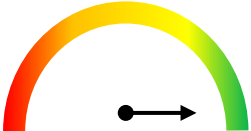
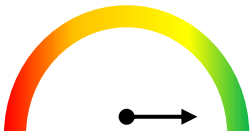
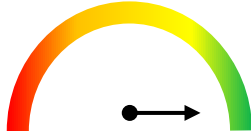
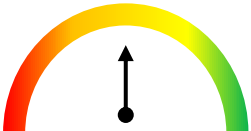
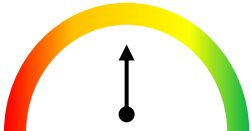
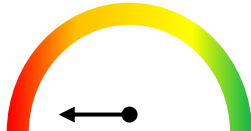
Smart home situational analysis – Devices

Impact of smart home devices

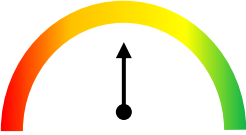
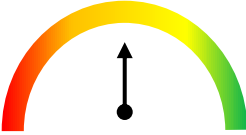
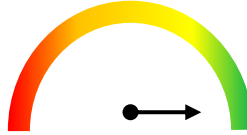
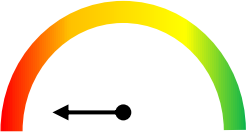

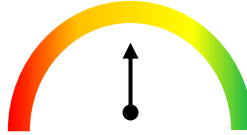
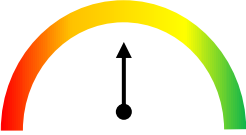
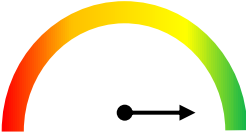
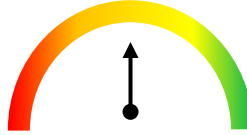
- **Seriousness:** The absolute impact (**high**, **medium**, **low**)
- **Urgency:** How quickly the issue needs to be addressed (**high**, **medium**, **low**)
- **Potential:** Whether the issue will be more significant in the future (**high**, **medium**, **low**)

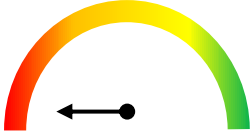
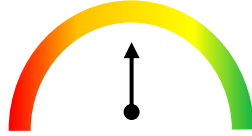
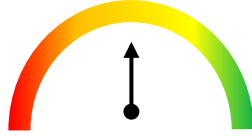
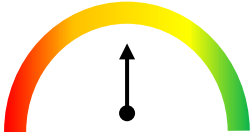
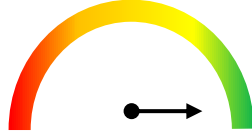
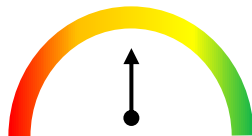
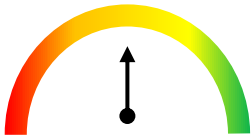
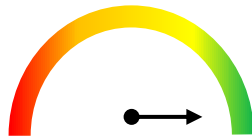
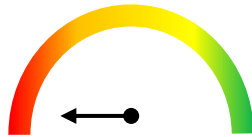


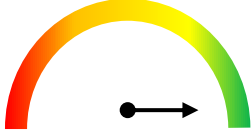
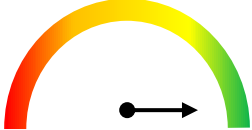

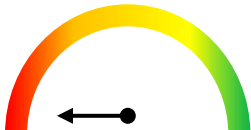
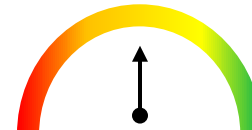
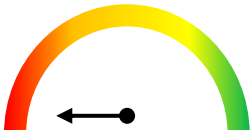
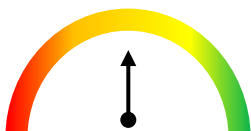
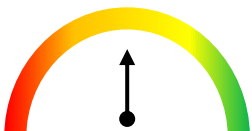
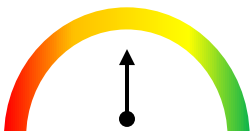
Smart home device impact: GDOs, smoke detectors, and door locks

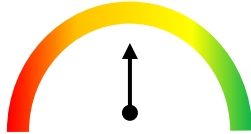
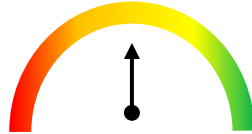
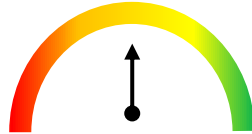
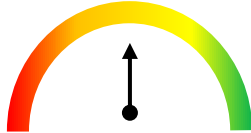
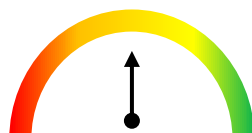
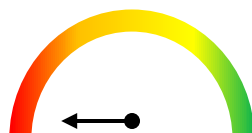
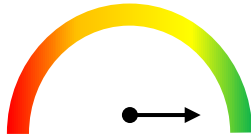
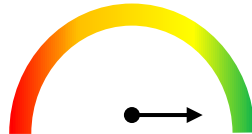
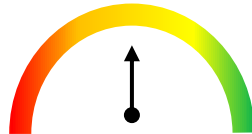
Device	Description	Seriousness	Urgency	Potential	Remarks
Garage door operators (GDOs)	Takeover devices attached to existing garage door operators or embedded (Chamberlain, Genie)	 <i>Low</i>	 <i>Low</i>	 <i>Medium</i>	GDOs do not often make headlines, but brands such as Chamberlain are looking to do more with these operators by embedding cameras and other sensors. Because home builders are installing more smart home tech, the long-term potential is positive.
Connected smoke detectors	Smoke detectors with advanced features (e.g., Nest Protect, First Alert OneLink Safe & Sound)	 <i>Low</i>	 <i>Low</i>	 <i>Low</i>	Although these smoke detectors offer convenient features, most smart speakers can now detect the sound of a smoke detector and alert homeowners, meaning these high-cost products are less useful.
Electronic door locks	Door locks that use Bluetooth, Wi-Fi, Zigbee, Z-Wave, etc.	 <i>Medium</i>	 <i>Medium</i>	 <i>High</i>	Single-family home builders and MDUs will present the most opportunity for door locks over the next five years. The flexibility of these devices will also drive adoption as consumers are presented with more use cases and designs (e.g., August, Schlage, and Level Home).


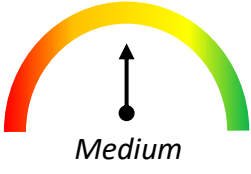
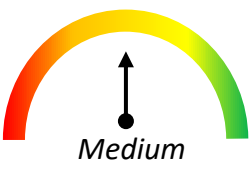
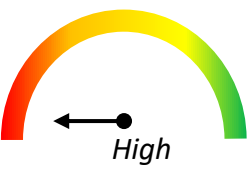
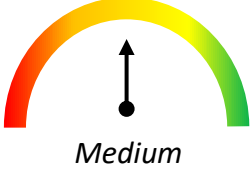
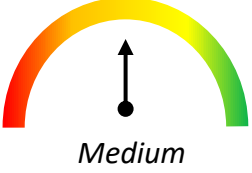
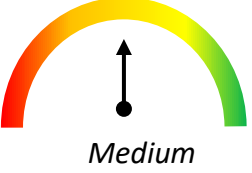
Smart home device impact: Cameras, doorbells, and intruder alarms

Device	Description	Seriousness	Urgency	Potential	Remarks
Consumer security cameras	Security cameras from brands such as Arlo, Swann, Nest, and Wyze	 <i>Medium</i>	 <i>Medium</i>	 <i>Low</i>	Security cameras are a pillar of the smart home. Driven by innovation in analytics and features, cameras continued to evolve and increase penetration. Nonetheless, saturation is imminent, and low-cost cameras with low or zero fees are on the rise.
Video doorbells	Dominated by Ring, video doorbells are a new technology relative to security cameras but are more limited than cameras	 <i>High</i>	 <i>Medium</i>	 <i>Medium</i>	Most often, homes will have only one video doorbell, while a home could have five or more security cameras, depending on its size. This alone lessens the outlook of video doorbells; however, doorbells remain one of the most popular security devices for homes today.
Intruder alarm sensors	Motion and open/close contacts that use Zigbee or Z-Wave and are non-proprietary sub-GHz	 <i>Medium</i>	 <i>Low</i>	 <i>Medium</i>	These sensors are most common with DIY projects. Although some traditional brands (JCI, Resideo, etc.) offer open protocol sensors, these are mostly tailored for companies such as Abode and SimpliSafe. Due to the continued influence of DIY security, the opportunity for these sensors is robust.

Device	Description	Seriousness	Urgency	Potential	Remarks
Smart speakers	Smart speakers from Amazon and Google have reshaped consumer electronics and the smart home.	 High	 Medium	 Medium	Smart speakers have had the most profound impact on the smart home relative to all other devices. Nonetheless, the industry is evolving. Smart speakers now have screens and will soon be more mobile. Also, more devices will come with digital assistants dedicated to that device, like appliances, reducing overall utility of dedicated smart speakers.
Major home appliances (MHA)	Home appliances with built-in connectivity is growing, but use cases are elusive	 Medium	 Low	 Medium	Despite efforts from leading MHA brands, consumers often do not understand the value of a connected MHA. Omdia has revised downward its projections for these products. Nonetheless, these products are already shipping with Wi-Fi capabilities, and consumers will soon have connected-capable appliances anyway.
Health monitors	Connected scales, blood pressure monitors, thermometers, etc.	 Medium	 Low	 High	Connected consumer-grade health devices continue to gain traction in the market, likely in tandem with the rise in telehealth. With brands such as Amazon being HIPAA compliant in the US, consumer electronic brands have a role to play in expanding the capabilities of health care providers.

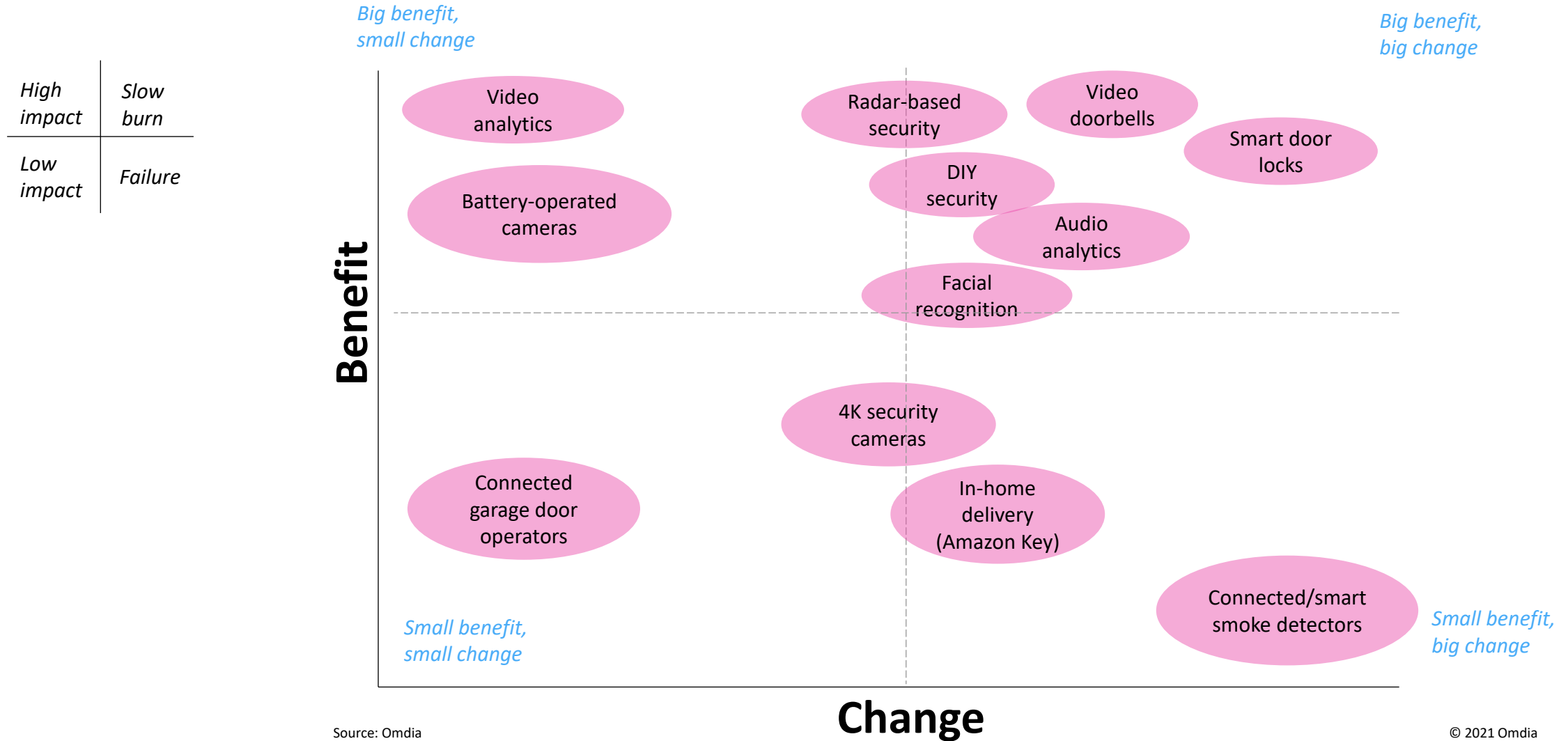
Device	Description	Seriousness	Urgency	Potential	Remarks
Irrigation panels	Irrigation panels control in-ground irrigation for homes	 Low	 Low	 Medium	Smart irrigation panels are often certified, which means users are eligible for a rebate (WaterSense). Combined with water leak management, these panels present an opportunity to conserve water. The single-family home builder market and general awareness of conservation is positive for this market.
Water leak devices	Water leak sensors and whole-home shutoff valves	 High	 Medium	 High	Water leak sensors are one of the fastest growing smart home devices. The potential opportunities with insurance companies is nascent while smart apartments will likely start installing these devices as a standard.
Air quality monitors	Air quality monitors are on the rise from brands including Airthings and Awair	 Medium	 medium	 Medium	Air quality monitors used to be most popular in Asia, where these devices were integrated into portable/wall air conditioner units. Now, with an increase in wildfires and air pollution awareness, there is growing demand for monitors that measure for PM2.5, VOCs, CO2, and Radon.

Device	Description	Seriousness	Urgency	Potential	Remarks
Light bulbs	Filament-style bulbs, colors, etc. mean there is flexibility with smart light bulbs	 Medium	 Medium	 Medium	Smart light bulbs offer more flexibility relative to smart light switches and plugs. Although the user experience can be less consistent, light bulbs provide consumers the convenience of smart lighting without rewiring light switches. Outdoor lighting is on the rise, and prices are falling—all positive indicators.
Plugs and switches	Plugs and switches are less exciting than light bulbs but offer continuous control of lighting, with no need to keep the switch in an on position.	 Medium	 Medium	 High	Plugs and switches are evolving. Brands like Brilliant have looked to reinvent the category while brands such as Jasco offer traditional alternatives. Potential is high for plugs/switches owing to the rise in smart apartments and home builders.
Blinds and shades	Blinds and shades are high-end products that often require customization	 Low	 Low	 Medium	Although connected motors are more common compared to past years, these products are often customized for the home, which brings high cost. Despite the cost, the return is potential energy savings. As smart home products become more common among home builders, it is possible smart blinds will become standard.

Device	Description	Seriousness	Urgency	Potential	Remarks
Ceiling fans	Smart fans can help circulate air to improve air quality; brands include Hunter and Big Ass Fans	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned at the far left (red) end, with a horizontal arrow pointing to the right. The word "Low" is written below the gauge.	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned at the far left (red) end, with a horizontal arrow pointing to the right. The word "Low" is written below the gauge.	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned at the far left (red) end, with a horizontal arrow pointing to the right. The word "Low" is written below the gauge.	Smart ceiling fans are an expensive product that hasn't gained much attention. Although it is possible these products could gain traction with home builders, the high price point will likely keep this product niche.
Radiator valves	Radiator valves reduce energy bills by only heating rooms that are occupied	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned in the middle (yellow) end, with a vertical arrow pointing upwards. The word "Medium" is written below the gauge.	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned in the middle (yellow) end, with a vertical arrow pointing upwards. The word "Medium" is written below the gauge.	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned at the far right (green) end, with a horizontal arrow pointing to the left. The word "High" is written below the gauge.	Radiator valves are mostly used in Europe, but demand remains strong. Omdia predicts a rise in demand for radiator valves as the European region introduces more standards and regulations regarding energy and climate change.
Thermostats	Smart thermostats integrate with utility programs such as TOU and demand response, helping to manage the grid and reduce energy costs	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned in the middle (yellow) end, with a vertical arrow pointing upwards. The word "Medium" is written below the gauge.	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned in the middle (yellow) end, with a vertical arrow pointing upwards. The word "Medium" is written below the gauge.	 A semi-circular gauge with a red-to-green gradient. A black dot is positioned in the middle (yellow) end, with a vertical arrow pointing upwards. The word "Medium" is written below the gauge.	While radiator valves are mostly used in Europe, thermostats are mostly used in North America. In a recent Omdia consumer survey, fewer respondents owned smart thermostats than expected, and enthusiasm was low. As utilities in the US begin to offer more programs and education and the use cases for smart thermostats increase, demand should follow. However, fragmentation in these programs means the financial incentive varies greatly by region.

Change-benefit analysis

Safety and security device innovation



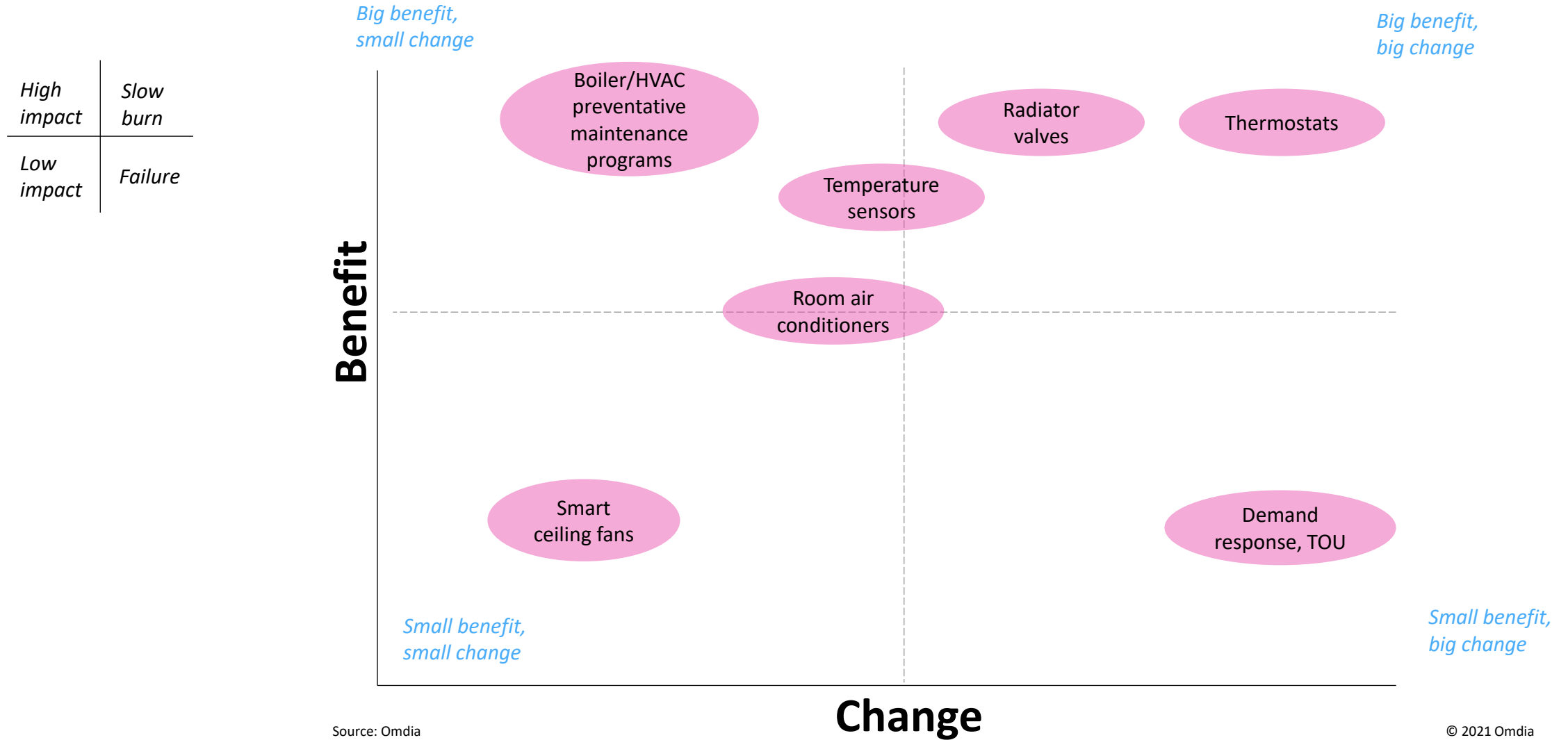
Source: Omdia

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Safety and security: Video analytics and battery-operated cameras have the highest impact

- Video analytics has had a profound impact on consumer DIY security cameras. Moreover, video analytics comes with the security cameras, either as a free feature or add-on via a monthly subscription. With video analytics, users are notified less often of moving trees or plants and more about things that matter, such as package or people identification.
- Battery-operated cameras have also changed the smart home and consumer security camera market. With battery-operated cameras, users can install cameras far from mains power. In addition, brands have started introducing ultra-long battery life with these cameras, claiming 12 months of use between replacement.
- Radar-based security straddles the line between high benefit/small change (high impact) and big benefit/big change (slow burn). This is because radar-based systems can be easy to install and have many valuable uses, but consumers will need to understand the potential privacy concerns with a device that can create a 3D map of a home.
- DIY security, audio analytics, video doorbells, and smart door locks are all considered “slow burn” because each are valuable but require more effort and understanding. For example, DIY security has taken business from professional alarm companies but requires a lot more work by the consumer, from replacing batteries to troubleshooting. Nonetheless, the benefit here is a huge annual cost savings for consumers, hence a tradeoff. Audio analytics is a relatively new trend that has enormous promise. Alexa Guard started this off by offering smoke alarm and breaking glass detection, effectively ending the market for smart smoke detectors. Perhaps the change for consumers is trusting the technology. Both smart locks and video doorbells require more work to install and set up relative to other smart home devices, despite the efforts of August and battery-operated doorbells from the likes of Ring and Nest. Nonetheless, these devices listed under big change/big benefit transcend individual smart home silos. For example, smart door locks can allow in-home package delivery or alert users when a family member arrives home. Video doorbells provide video surveillance without the overbearing nature of indoor security cameras.
- Facial recognition is toward the center of the chart because it can provide a big benefit to consumers, but the accuracy and legal disputes vary greatly by country and even municipality.
- Connected garage door operators are mostly single-use devices but are valuable because in the US, the garage door is often the most widely used entry point into the home. Brands such as Chamberlain have even gone a step further and embedded cameras into the operator.
- 4K security cameras were once highly sought after but have fallen from brands’ strategies over the past 24 months. In-home delivery remains a niche offering; for some consumers, it can have big benefit, although the change is also big.

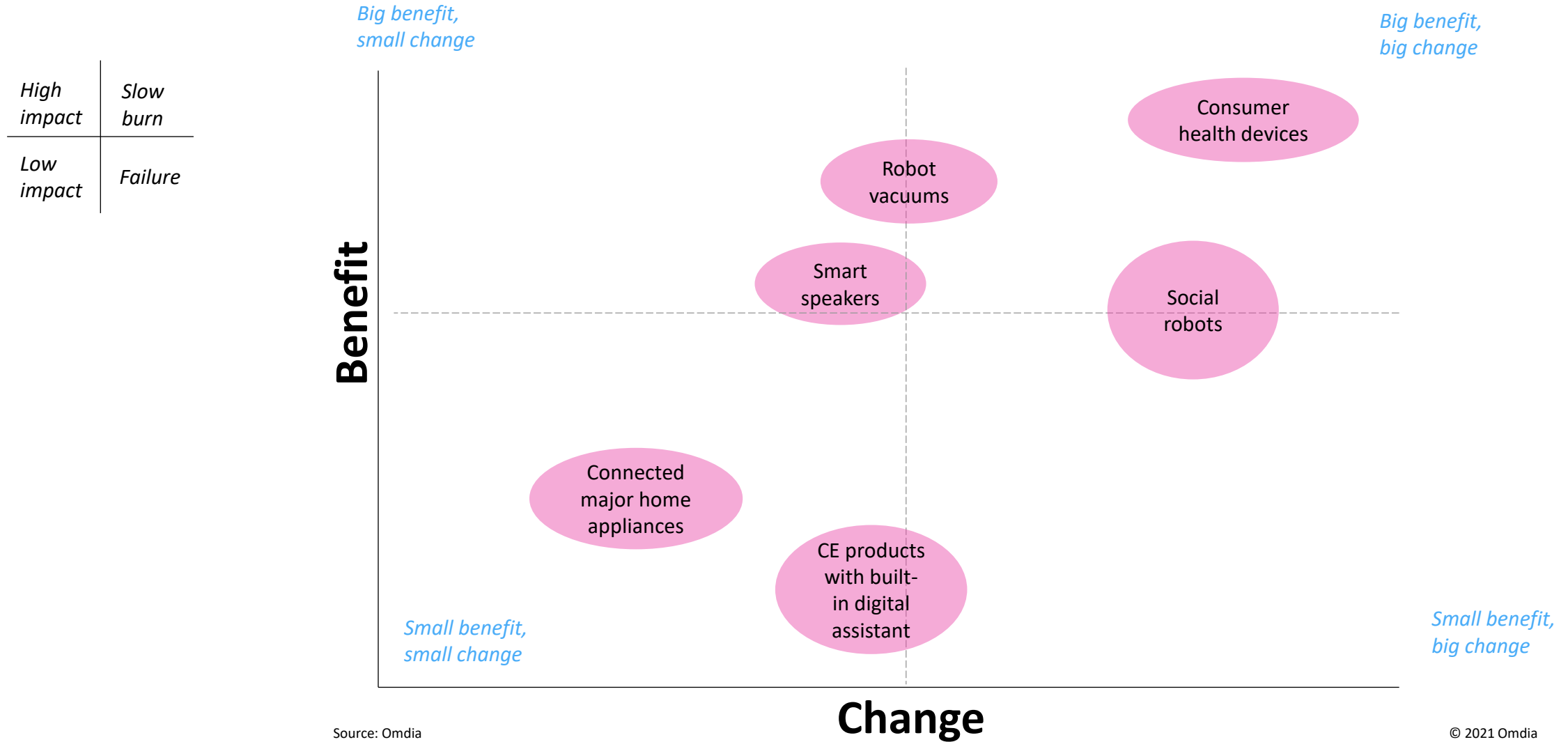
Climate control device innovation



Climate control: Preventative maintenance leads high impact innovation

- Boiler and HVAC preventative maintenance can be as simple as signing up with a provider. Because these are usually professionally installed, the most difficult part is handled by a professional.
- Temperature sensors are simple to place around a home to help average out temperatures across homes that use a central heating and cooling system. This device is partially in the slow burn quadrant because consumers continue to be less enthusiastic about smart thermostats relative to other smart home devices. Consequently, Omdia believes adoption of these sensors will also be slower despite the simple installation. Moreover, it took Nest seven years to release sensors that work in tandem with its smart thermostat.
- Radiator valves and smart thermostats are also slow burn devices. Despite a compound annual growth rate (CAGR) of 18% from 2020 to 2025 in the Americas region, thermostats remain underutilized. Meanwhile, radiator valves will have a unit shipment CAGR of 26% in EMEA from 2020 to 2025. The global penetration rate for smart thermostats in 2020 was about 5.5%, and the penetration of radiator valves was 1.3%. By comparison, the penetration of smart speakers was 16% in 2020. Although the first smart thermostat was introduced about 10 years ago, penetration remains low.
- Smart room air conditioners have the potential to reduce energy bills by utilizing occupancy sensors and other algorithms. Room air conditioners fit in all four quadrants because in some cases they will require a professional and because this device is mostly used in Asia. So, although the utility of the product is obvious, the degree of change required on behalf of the consumer is not clear.
- Smart ceiling fans are very expensive. Although these devices can be integrated with air quality monitors and HVAC systems to help refresh air, these devices are a premium product and are designed for a small segment of the population.

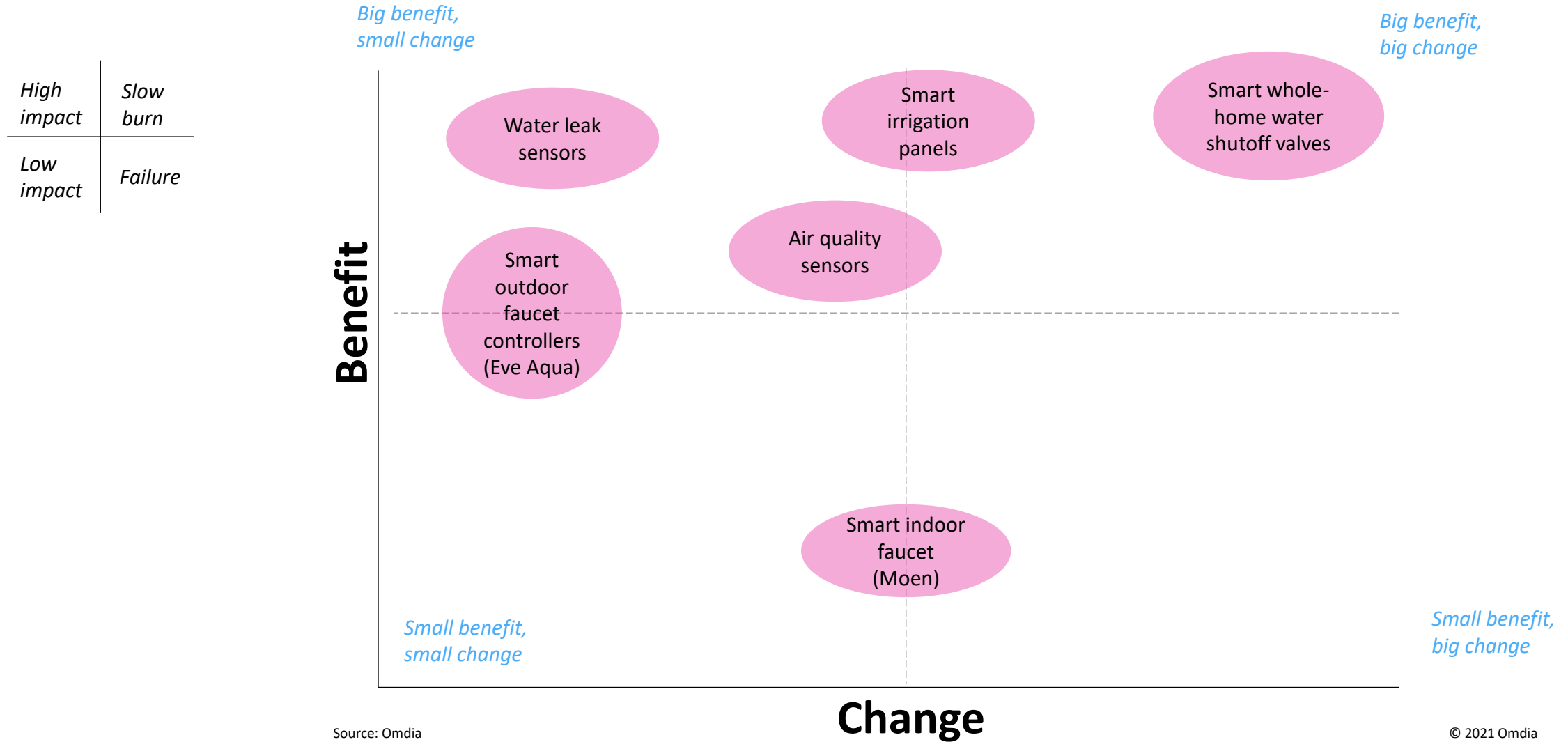
Consumer device innovation



Consumer devices: Smart speakers and robot vacuums are the highest impact devices

- Since 2014, smart speakers have been the most influential smart home device available to consumers. Although consumers continue to use smart speakers mostly to set timers, check weather, and play music, the impact on broader consumer electronics is undeniable. Smart speakers are capable of far more than just basic questions and commands—they can be used to identify sounds in the home to alert emergency responders or provide hands-free experiences for people with disabilities. In the coming years, smart speakers will utilize advanced audio analytics to identify sickness or health emergencies, such as COVID-19.
- Robot vacuums are a luxury device but still have been modern marvels in terms of using computer vision and radar/lidar. At first, these devices were so rudimentary they would just bounce around a room until the vacuum thought it was clean. Now, using a combination of sensors, robot vacuums precisely map rooms while avoiding obstacles, such as shoes and socks.
- Using a combination of machine learning, AI, smart speakers, and robot vacuum technologies, social robots will be the next step for companionship in smart homes. Another subjective device, some consumers will immediately gravitate toward these products while others will shun them for privacy reasons. Nonetheless, the use case for these robots will be strong with senior care and for those living with disabilities.
- Consumer health devices, such as smart scales, glucose monitors, and blood pressure monitors are on the rise as telehealth services increase in tandem. Although using medical devices in the home to report back to a medical provider will be a novel approach, it will nonetheless be a slow-burn market opportunity.
- Omdia continues to revise downward the market size for connected major home appliances. Although computer vision and convenience are drivers for these appliances, consumers have yet to embrace the technologies. However, as the price for these devices is reduced, Omdia expects more consumers to buy smart ovens that automatically identify a recipe and the food type to precisely cook a dish. Likewise, smart refrigerators that can identify food for recipes and alert users to spoilage could cut food waste significantly. Despite slow adoption, the market remains nascent as brands continue to explore new and valuable uses that are compelling for consumers.

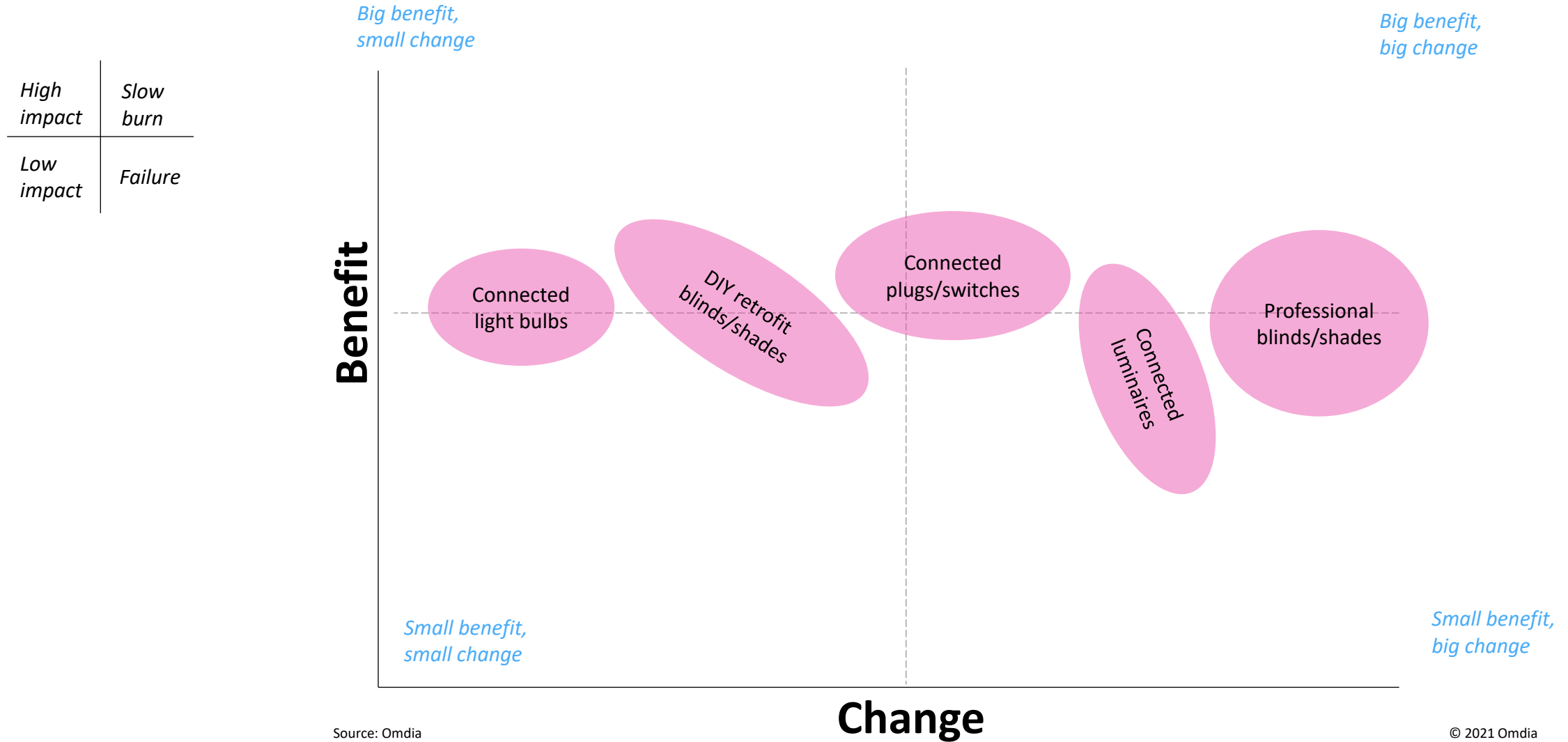
Energy and water device innovation



Energy and water: Water leak sensors are the highest impact devices in this category

- Omdia projects water leak sensors and shutoff valves to be one of the fastest growing devices for the smart home, with a 2020–25 CAGR of 54% in the Americas. As brands such as LeakBot enter the US market and others, such as Moen, begin offering supplemental services, we expect water leak sensors to have a big impact on insurance claims and losses. In addition to single-family homes, Omdia expects that home builders could start to include smart/connected water sensors on the main water line in the home. This will allow the device to shut off water if a leak is detected and to measure water usage. Although shutoff valves that require a plumber to cut piping would be a big change for many consumers, there are several retrofit products that do not require the main water line to be dismantled. Moreover, the current bellwether for these devices are sensors that are placed in areas of the home susceptible to water damage, such as sinks, toilets, and washing machine. However, larger homes require many sensors while a main line device could cover an entire home.
 - The whole-home water shutoff valves, such as the Flo by Moen, typically require a plumber and can cost close to \$1,000, so they are big change/big benefit.
- Air quality monitors are on the rise. These devices require no installation and only need up to one week to calibrate. Once calibrated, these devices can warn homeowners of pollutants including radon, CO₂, and VOCs, among others. This device straddles the upper two quadrants because mitigation of air pollution can be a big change. This could require professional assistance, opening windows more often, or adding fans/air purifiers throughout the home.
- Smart irrigation panels, such as Rachio, straddle the upper two quadrants. In most cases, these panels are simple to install and do not require a professional. However, these panels can be expensive depending on the number of zones needed, and some yards may require adjustments to the automated settings, which could be a big change for some consumers.
- Smart outdoor faucets, such as the Eve Aqua, are meant for consumers who want to manage irrigation but do not have an in-ground irrigation system. With devices like the Eve Aqua, users can set timers for hoses, reducing water waste, but this is often region specific where in-ground irrigation is not common.
- Smart water faucets that are meant to replace kitchen taps cross the bottom two quadrants because the products are expensive for the perceived return. Unlike smart irrigation systems, these indoor faucets are not likely to save any measurable amount of water and are purely convenience products.

Lighting device innovation



Lighting: All device types fit on the horizontal axis, suggesting none are overtly beneficial or change focused

- Connected light bulbs and retrofit shades fit in the left two quadrants owing to their ease of installation and the benefit these products can bring. In terms of benefits, smart lighting can be a theft deterrent and provide additional peace of mind. For example, outdoor and indoor lighting can illuminate if there is motion or an unidentified person is detected when in an armed away state or during nighttime hours. Moreover, lighting can be triggered at night if a garage is opened, providing peace of mind when walking into the home.
- DIY blinds and shades can support an existing HVAC unit by opening and closing blinds based on the desired temperature. During the summer months, blinds can detect sunlight and adjust to keep direct sunlight (heat) out of the home, with the potential opposite effect during winter months. DIY shades differ from professional ones because these products can be installed by the user and do not require specific measurements or custom ordering.
- Connected plugs and switches straddle all four quadrants because of the variation among these devices. When retrofitting mains-powered switches, electricians are often needed depending on the region, as this requires a certain degree of expertise. But the benefit can be equal or greater than that of smart light bulbs, especially if colored lighting is not considered. Despite the added difficulty of installation, if a homeowner is looking to automate more than six light bulbs, it may be more economical to replace the single light switch rather than all the light bulbs. Also, the experience could be superior, depending on the light bulb brand. For example, the popcorn effect (lights turning on at different times) is less likely when replacing the light switch, opposed to each light source.
- Luminaires have gained attention over the past few years, with brands such as Philips Hue coming to market with products that replace entire lighting sources, like a chandelier or track lighting. These are often expensive and can be difficult to match to existing home design. Moreover, depending on the region, a professional may be needed for the installation.
- Professional blinds and shades are far more common than DIY but are far more expensive and require a professional for the installation. Professional blinds and shades are most common in high-end homes and are often provided and integrated with the likes of Control4 or Crestron. In Europe, it is common to have outdoor shades for the windows; automating these is highly beneficial. For this reason, the EMEA region is forecast to represent about 60% of global shipments of professional connected blinds/shades in 2025.

The smart home market in 2030

Matter is the catalyst for smart home growth

- For the smart home market, the next 10 years will bring broader adoption than the previous 10 years, which mostly consisted of technology enthusiasts and early adopters.
- The next decade will be different because consumers will begin to encounter smart home technology, especially when buying a new home or renting an apartment.
- Insurance companies will also begin, at a minimum, to subsidize products such as water leak sensors and potentially other smart home devices that can act as a “drive safe and save” program (like State Farm’s) for inside the home. State Farm’s program offers policy holders an option to allow the insurer to track driving behavior with a small device that attaches to the windshield. For some drivers, this can offer huge savings on annual premiums. For inside the home, various devices including water leak detectors, water shutoff valves, Ting’s electrical monitor, and smoke detectors could monitor policy holders and offer discounts on home insurance.
- Matter will play a vital role in spearheading this growth curve. Although Omdia believes that Matter itself will not solve consumer challenges at the retail level, what Matter brings is a shift in resources for brands to focus on value-added services and features. Before Matter, the certification processes and APIs could slow or hinder product releases, but with Matter, theoretically, this should be less of a constraint.

Top trends to watch over the next 10 years					
Senior care	Social robots	Smart apartments	Smart home insurance	Invisible sensing technologies	Radar/lidar
Smart electrical panels	Smart irrigation	Smart utility platforms	UWB	Thread	Wi-Fi Sensing
Facial recognition	Matter	Home builders	Telehealth with consumer health devices	Local/edge-based processing	AI (especially with professional security services)

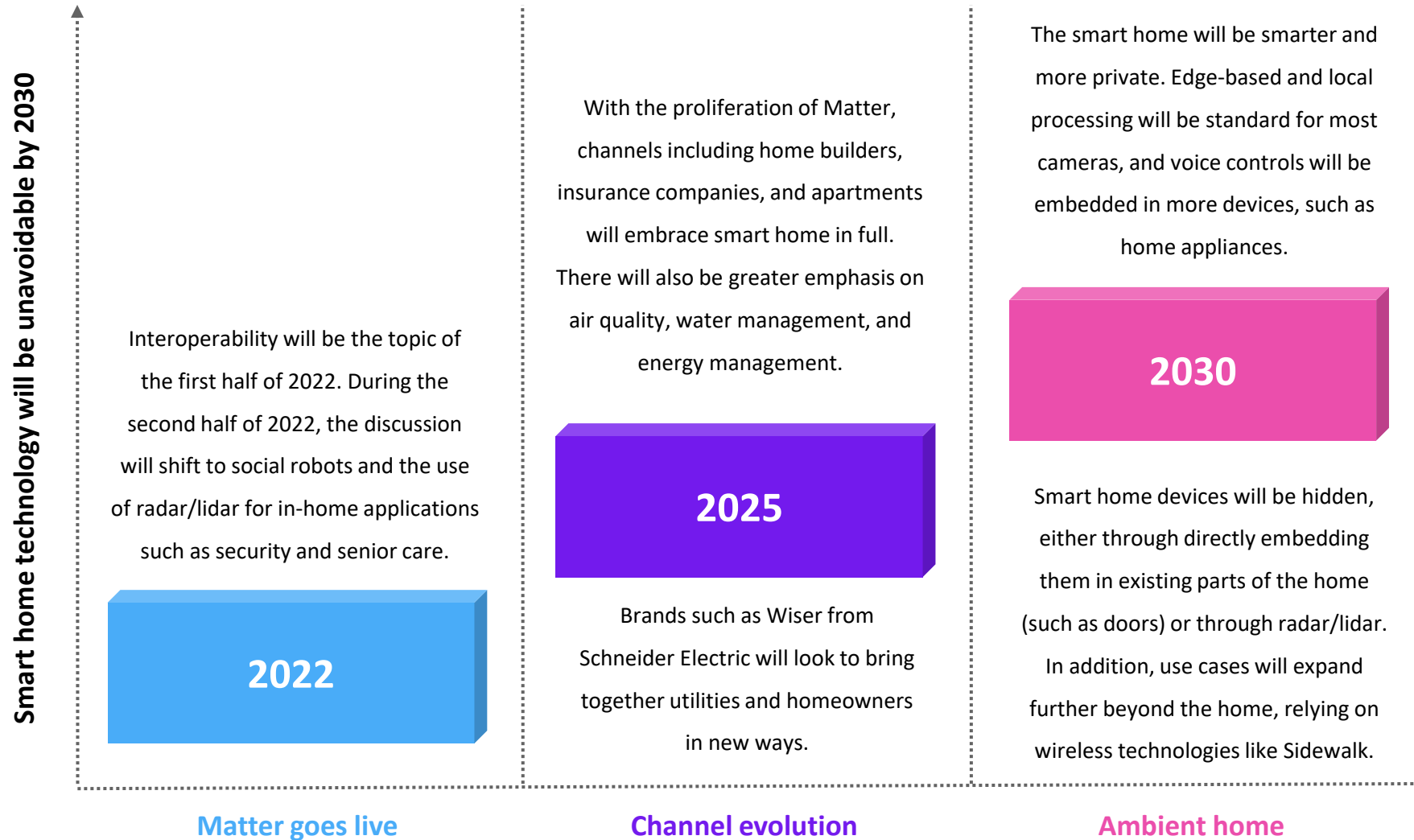
Matter is the catalyst for smart home growth

- During the next 10 years, devices like smart speakers will inevitably slow in mature markets, like the US, as the focus pivots to advanced use cases that involve new wireless and sensing technologies and sustainability.
- The table on the right shows general growth direction for each device type over the next 10 years.

	Big decline
	Small decline
	Flat
	Small growth
	Big growth

Ten-year growth outlook					
Intruder alarms		Lighting		Health/fitness	
Garage door operators		Plugs/switches			
Smoke detectors		Blinds/shades			
Electronic locks		Fans			
Video cameras		Radiator valves			
Video doorbell		Thermostats			
Water/temperature sensors		Air conditioners			
Irrigation		Home audio			
Air quality		Appliances			

The smart home market in 10 years



Source: Omdia

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Imports/exports

Shipping data for home devices

- The following tables show the revenue value of exports for home devices including thermostats, door locks, intruder alarms, light bulbs, motorized shades, portable air conditioners, security cameras, smoke detectors, and air purifiers.
- The data was obtained from Harmonized System (HS) Codes, specifically HS6 codes.
- Omdia can provide the list of specific HS codes upon request.

Importers – Revenue (\$m)

World market for thermostats – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
US	954	840	942	1,034	1,041	967	0.3%
Germany	357	356	385	417	419	405	2.5%
China	198	216	244	312	345	340	11.4%
Hong Kong	203	201	217	237	226	189	-1.4%
France	150	174	176	187	176	175	3.0%
Total thermostat imports (\$m)	1,862	1,788	1,964	2,186	2,208	2,075	2.2%
Annual growth		-4.0%	9.8%	11.3%	1.0%	-6.0%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for intruder alarms – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
US	565	677	793	792	772	612	1.6%
Germany	507	544	532	538	492	527	0.8%
UK HMRC	426	369	360	456	455	358	-3.4%
Netherlands	217	189	224	205	238	229	1.0%
France	386	172	191	220	218	220	-10.6%
Total intruder alarm imports (\$m)	2,101	1,952	2,100	2,212	2,176	1,946	-1.5%
Annual growth		-7.1%	7.6%	5.3%	-1.6%	-10.5%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for door locks – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
US	874	824	889	1,018	1,072	1,020	3.1%
Germany	217	218	228	253	256	251	2.9%
UK HMRC	169	152	159	176	194	168	-0.2%
Netherlands	77	91	102	133	148	152	14.6%
France	144	152	159	175	174	148	0.5%
Total door lock imports (\$m)	1,481	1,436	1,538	1,756	1,844	1,738	3.2%
Annual growth		-3.0%	7.1%	14.2%	5.0%	-5.7%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for light bulbs – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
Hungary	33	39	37	38	8	48	8.0%
Mexico	24	34	32	42	41	43	12.7%
France	48	27	32	34	34	30	-8.7%
US	36	18	31	44	29	20	-10.8%
Spain	37	30	29	18	15	17	-14.1%
Total light bulb imports (\$m)	177	148	160	175	127	159	-2.1%
Annual growth		-16.6%	8.0%	9.8%	-27.4%	25.2%	

Notes: Includes USD import value only

Source: IHS Markit

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Importers – Revenue (\$m)

World market for motorized shades – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	6,133	6,634	8,644	9,250	8,579	8,328	6.3%
US	3,397	3,426	4,428	4,649	4,561	4,225	4.5%
Germany	1,925	2,207	2,434	2,913	2,924	2,920	8.7%
Hong Kong	787	795	1,178	1,353	1,268	1,320	10.9%
Mexico	1,762	1,764	2,056	1,924	1,729	1,320	-5.6%
Total motorized shades imports (\$m)	14,003	14,826	18,739	20,088	19,061	18,113	5.3%
Annual growth		5.9%	26.4%	7.2%	-5.1%	-5.0%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for security video cameras – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
US	5,687	5,770	6,704	7,422	7,662	7,457	5.6%
Germany	1,997	2,178	2,381	2,491	2,546	2,615	5.5%
China	9,670	5,791	4,770	4,501	3,382	2,508	-23.7%
Hong Kong	3,153	2,757	2,983	3,424	3,225	2,354	-5.7%
Japan	1,625	1,536	1,893	2,191	2,431	2,270	6.9%
Total security video camera imports (\$m)	22,133	18,031	18,732	20,029	19,247	17,203	-4.9%
Annual growth		-18.5%	3.9%	6.9%	-3.9%	-10.6%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for portable air conditioners – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
US	1,072	1,304	1,465	1,688	1,622	1,514	7.1%
Canada	334	320	346	402	459	404	3.9%
Germany	220	262	317	316	298	311	7.1%
Netherlands	59	79	86	118	144	228	31.2%
France	119	114	123	142	146	182	8.8%
Total portable air conditioner imports (\$m)	1,805	2,078	2,337	2,666	2,669	2,638	7.9%
Annual growth		15.2%	12.4%	14.1%	0.1%	-1.2%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for smoke detectors – Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
US	1,173	1,286	1,418	1,489	1,664	1,368	3.1%
Germany	695	803	710	742	724	774	2.2%
UK HMRC	528	473	436	528	544	454	-3.0%
France	560	305	319	371	408	448	-4.4%
Netherlands	268	249	290	276	318	343	5.1%
Total smoke detector imports (\$m)	3,225	3,117	3,174	3,407	3,658	3,387	1.0%
Annual growth		-3.3%	1.8%	7.3%	7.4%	-7.4%	

Notes: Includes USD import value only

Source: IHS Markit

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Importers – Revenue (\$m)

World market for air purifiers - Importers

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	135	157	101	147	109	82	-9.4%
South Korea	52	52	56	68	82	57	2.1%
Taiwan	4	14	27	37	63	56	68.8%
Brazil	25	24	33	36	37	42	10.9%
Russia	16	18	24	24	27	32	15.1%
Total air purifier imports (\$m)	231	264	240	313	318	269	3.1%
Annual growth		14.2%	-9.0%	30.0%	1.6%	-15.3%	

Notes: Includes USD import value only

Source: IHS Markit

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Exporters – Revenue (\$m)

World market for thermostats – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	549	579	686	753	566	564	0.5%
Germany	440	441	498	566	563	564	5.1%
Mexico	484	410	474	518	525	482	-0.1%
US	217	185	201	229	251	220	0.2%
France	217	206	210	216	220	214	-0.3%
Total thermostat exports (\$m)	1,908	1,822	2,069	2,282	2,126	2,044	1.4%
Annual growth		-4.5%	13.5%	10.3%	-6.8%	-3.9%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for intruder alarms – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	1,143	1,135	1,008	1,055	1,028	867	-5.4%
Germany	281	305	338	393	407	365	5.3%
Mexico	288	288	252	291	416	354	4.2%
UK HMRC	510	454	455	456	435	343	-7.6%
US	329	323	323	343	362	303	-1.6%
Total intruder alarm exports (\$m)	2,552	2,506	2,377	2,539	2,648	2,233	-2.6%
Annual growth		-1.8%	-5.1%	6.8%	4.3%	-15.7%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for door locks – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	1,720	1,611	1,572	1,630	1,646	1,595	-1.5%
Mexico	396	350	400	443	443	430	1.7%
Germany	338	345	365	422	419	409	3.9%
Taiwan	253	254	276	313	331	360	7.3%
US	191	199	190	203	216	164	-3.0%
Total door lock exports (\$m)	2,898	2,759	2,804	3,010	3,056	2,958	0.4%
Annual growth		-4.8%	1.6%	7.4%	1.5%	-3.2%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for light bulbs – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	86	127	166	54	44	157	12.9%
Belgium	151	153	171	199	178	145	-0.7%
Italy	10	34	37	37	44	35	29.5%
France	55	41	25	25	31	21	-17.6%
US	26	25	28	24	20	15	-10.1%
Total light bulb exports (\$m)	327	380	426	339	317	373	2.7%
Annual growth		16.2%	12.1%	-20.4%	-6.6%	17.9%	

Notes: Includes USD import value only

Source: IHS Markit

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Exporters – Revenue (\$m)

World market for motorized shades – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
Germany	6,907	7,237	8,779	10,084	10,292	8,966	5.4%
China	2,087	2,610	2,878	3,557	4,245	4,859	18.4%
Japan	4,142	4,545	5,453	5,569	5,263	4,827	3.1%
US	4,078	3,450	3,672	3,650	3,787	3,265	-4.3%
South Korea	2,968	2,868	4,006	4,404	4,260	3,103	0.9%
Total motorized shades exports (\$m)	20,182	20,709	24,789	27,265	27,846	25,020	4.4%
Annual growth		2.6%	19.7%	10.0%	2.1%	-10.1%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for security video cameras – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	11,764	9,396	9,091	10,685	9,746	10,841	-1.6%
Hong Kong	2,345	2,128	2,677	3,365	3,715	3,483	8.2%
Germany	1,670	1,860	2,191	2,392	2,444	2,621	9.4%
Japan	3,646	3,566	3,435	3,240	2,727	2,403	-8.0%
Netherlands	3,204	3,071	2,989	2,742	2,512	2,295	-6.5%
Total security video camera exports (\$m)	22,628	20,021	20,384	22,425	21,144	21,642	-0.9%
Annual growth		-11.5%	1.8%	10.0%	-5.7%	2.4%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for portable air conditioners – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	829	920	608	701	652	1,009	4.0%
Mexico	751	821	993	1,219	1,167	908	3.9%
US	717	705	630	626	642	587	-3.9%
Italy	393	408	485	543	517	490	4.5%
Canada	112	147	148	180	255	394	28.7%
Total portable air conditioner exports (\$m)	2,802	3,001	2,865	3,269	3,233	3,387	3.9%
Annual growth		7.1%	-4.5%	14.1%	-1.1%	4.7%	

Notes: Includes USD import value only

Source: IHS Markit

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World market for smoke detectors – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	1,539	1,535	1,419	1,510	1,548	1,606	0.9%
US	677	657	700	766	793	635	-1.3%
Germany	471	553	581	647	634	609	5.3%
Netherlands	231	206	214	231	403	490	16.2%
Mexico	396	375	394	419	555	474	3.6%
Total smoke detector exports (\$m)	3,314	3,326	3,308	3,574	3,934	3,815	2.9%
Annual growth		0.4%	-0.5%	8.0%	10.1%	-3.0%	

Notes: Includes USD import value only

Source: IHS Markit

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Exporters – Revenue (\$m)

World market for air purifiers – Exporters

Top five countries – Millions of dollars

	2015	2016	2017	2018	2019	2020	CAGR 2015–20
China	590	574	547	633	424	374	-8.7%
Thailand	136	141	133	130	109	76	-11.0%
South Korea	12	16	17	24	18	27	18.1%
Japan	16	25	27	28	27	22	5.6%
Switzerland	21	24	26	28	17	16	-5.0%
Total air purifier exports (\$m)	775	780	750	843	594	514	-7.9%
Annual growth		0.7%	-3.9%	12.4%	-29.5%	-13.5%	

Notes: Includes USD export value only

Source: IHS Markit

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Appendix

Scope and definitions

Introduction

This report assesses numerous smart home industry scenarios. The purpose is to present alternate paths that the smart industry may take based on device and industry trends. Unlike other smart home reports from Omdia, this report is mostly qualitative and hypothetical, with scenario-based forecasts through 2030 in the accompanying Excel workbook. Moreover, this report includes historical imports and exports (based on HS codes) for several devices such as thermostats and door locks.

Scope

The geographic scope of this study is the world, split into the major regions of the Americas; Europe, Middle East, and Africa; and Asia and Oceania. Each major region is defined as follows:

The Americas region is defined as:

- North America: US and Canada
- Latin America and the Caribbean: Argentina, Brazil, Mexico, and Rest of Latin America; the rest of Latin America includes Costa Rica, Panama, Guatemala, Colombia, Peru, Venezuela, Bolivia, Paraguay, Uruguay, Chile, and Ecuador.

Europe, Middle East, and Africa is defined as:

- Western Europe: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and UK
- Eastern Europe: Bulgaria, Croatia, Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, and Ukraine
- Middle East: Bahrain, Iran, Iraq, Israel, Kuwait, Oman, Qatar, Saudi Arabia, Turkey, and United Arab Emirates
- Africa: Egypt, Ghana, Kenya, Nigeria, South Africa, Tanzania, and Uganda

Scope and definitions

The Asia and Oceania region is defined as:

- Central and Southern Asia: India, Kazakhstan, and Pakistan
- Oceania, Eastern, and South-Eastern Asia: Australia, China, Hong Kong, Indonesia, Japan, Malaysia, Myanmar, New Zealand, Philippines, Singapore, South Korea, Taiwan, Thailand, Vietnam

Named countries include US, Canada, Mexico, France, Italy, Spain, Germany, UK, China, India, Japan, South Korea, Singapore, and Australia

Device categories

Safety and security

- **Garage door operators:** Motorized devices used to open and close commercial or residential garage doors.
- **Hazard detectors:** This category includes fire detectors used in single-family and multifamily homes. A fire detector is a device that senses the combustion products of a fire including smoke, heat, flame, and carbon monoxide. The fire detectors included in this report are optical, ionization, heat, aspirating, beam, flame, carbon monoxide (CO),

and multi-sensor. Single-family is defined as a freestanding, detached dwelling unit, typically built on a lot larger than the structure itself, resulting in an area surrounding the house. Multifamily includes apartments, flats, villas, condos, terraced housing, high-rise apartment flats, and all other semi-detached housing units. Typically, this sector is represented by a landlord and the housing is rented. Examples include Nest Protect and First Alert Safe & Sound.

- **Consumer and DIY video surveillance equipment:** Omdia defines consumer and DIY video surveillance equipment as that distributed through a diversified network of physical and online retailers. These products are designed for residential and small and medium-sized businesses (SMB) applications and are to be installed by the consumer. However, the equipment should be installed professionally by an electrician or security equipment installer once purchased through the retail channel.
- **Security camera:** A video camera developed specifically for use in security and related applications. The category does not include PIR cameras or video cameras designed for non-security applications (e.g., camcorders, webcams, machine vision cameras, professional broadcast cameras, night vision cameras). The market size estimates for cameras do not include revenue from camera accessories such as lenses (unless built-in), pan and tilt units, housings, brackets, or infra-red lighting.

Scope and definitions

- **Video doorbell:** This is a residential product designed to replace a conventional doorbell. Video doorbells do not have a fixed indoor unit but instead connect to an end user's smartphone or tablet via an app.
- **Electronic locks**
 - **Electro-mechanical locks:** Door-mounted, typically battery-operated devices that combine electronic circuitry and a mechanical latching mechanism; these work in conjunction with a reader device to provide access to individuals with valid credentials. Credentials may be an access token or PIN code. Such locks may or may not be wirelessly enabled.
 - **Cylinder locks:** This product is a standalone system capable of making access decisions. The electronic/mechatronic locking cylinder's integrated chip identifies keys, badges, or other contactless media, checks access authorization, and couples an actuator with the outer knob in the case of a positive access authorization.
- **Intruder alarms**
 - **Motion sensors:** These detect motion by sensing any thermal contrast between a moving object and a stationary background. They are typically installed indoors on walls, doors, or windows or in air ducts.
 - **Magnetic contacts:** These form a circuit between a door and doorframe or a window and sill. When the door or window is opened (and the alarm system is on), the circuit is broken and sounds the alarm.

Energy and water control

- **Irrigation:** Smart irrigation panels are becoming more popular as a replacement for traditional irrigation panels for home irrigation systems. Compared to traditional panels, smart irrigation panels connect to more sources such as weather stations and the internet to manage watering schedules. Please note that sprinklers (and related data) are excluded from the scope of this report; irrigation panels are the only devices in this segment considered in the scope of this report.
- **Smart water/temperature sensors:** Water sensors detect leaks through either water flow monitoring or by being directly exposed to water. Temperature sensors connect to the home automation system and provide alerts when temperature thresholds are exceeded.
- **Air quality devices:** These measure volatile organic compounds (VOC) and particulate matter (PM2.5) and alert to other impurities in the air.

Scope and definitions

Climate control

- **Smart fans:** These are ceiling fans that have embedded connectivity and can be managed by a smartphone, tablet, or computer.
- **Smart radiator valves:** Radiators are heat exchangers designed to transfer thermal energy from one medium to another for the purpose of space heating. Furthermore, radiators are closely associated with boilers, not furnaces. Boilers are special-purpose water heaters. While furnaces carry heat in warm air, boiler systems distribute the heat in hot water, which gives up heat as it passes through radiators or other devices in rooms throughout the house. The cooler water then returns to the boiler to be reheated. Hot water systems are often called hydronic systems. Residential boilers generally use natural gas or heating oil for fuel. Smart valves control the temperature of individual radiators and provide remote connectivity, similar to smart thermostats.
- **Smart/connected thermostats:** These can have a programmed schedule but also have internet connectivity that allows monitoring and changes to the schedule to be made on a computer or smartphone. Also known as “programmable connected” thermostats. In addition to this functionality, thermostats can make changes to temperature settings based on algorithms that consider different inputs. Currently, smart thermostats base decisions on location or presence.
- **Air conditioners:** This category includes only room and portable air conditioners. A smart connected air conditioner can receive, interpret, and act on a signal received remotely from a home automation system, a utility or third-party energy service provider, or another smart device (e.g., a smartphone or smart TV). The connectivity module can be built-in, or it can be a retrofit type used to connect to traditional non-smart appliances to enable this functionality.

Lighting and controls

- **Lighting:** These contain RF or powerline technology inside the light in the residential application. Lamps are an easily removed light source that can be retrofitted into existing fixtures. They are generally shipped either with a remote control or with a gateway to add functionality such as cloud access.
- **Plugs/switches:** Smart plugs are inserted into existing wall electrical outlets. These plugs have built-in connectivity that allows devices (often lamps or small appliances) to be controlled by a smartphone, tablet, or computer. Smart switches replace existing wall switches that control things such as ceiling fans and light fixtures. Switches often require the assistance of a certified electrician for installation.
- **Blinds/shades:** These are motorized blinds/shades that can be controlled via a computer, smartphone, or tablet from a remote location.

Scope and definitions

Consumer electronics

- **Home audio:** This category includes smart speakers such as Google Home and Amazon Echo.
- **Appliances:** A smart connected appliance can receive, interpret, and act on a signal received remotely from a home automation system, a utility or third-part energy service provider, or another smart device (e.g., a smartphone or smart TV). The connectivity module could be built-in or be a retrofit type used to connect to traditional non-smart appliances to enable this functionality. Examples include washing machines, clothes dryers, dishwashers, refrigerators, and large cooking appliances.
- **Health/fitness**
 - Wellness devices are not classified as clinical, and in the US they are not covered under Food and Drug Administration (FDA) or Health Insurance Portability and Accountability Act (HIPAA) requirements. Wellness devices are often used by active individuals who do not have chronic illnesses. Device examples include sports and fitness monitors, digital pill dispensers, personal scales, and digital thermometers.
 - Medical devices are often governed by governmental guidelines (e.g., in the US, they are governed by FDA and HIPAA guidelines). These devices are clinical-grade and are used by physicians to manage patient wellbeing. These devices often feed information directly into an electronic health record (EHR). Examples of devices include blood glucose meters, blood pressure monitors, cholesterol meters, and patches.
- Remote patient monitoring (RPM) is the remote exchange of physiological data between an at-home patient and a healthcare provider or medical staff in a hospital to assist in diagnosis and monitoring. It includes (among other things) a gateway unit to aggregate readings from vital sign monitors for clinical review at a remote location (for example, a hospital or physician’s office) using phone lines or wireless technology.
- Personal emergency response systems (PERS) are medical monitoring services that require users to press a distress button to alert a central station that they are injured and require assistance. Typically, personnel at the central station can speak to the individual through a microphone and speaker system in the control panel to decide what action should be taken. A recent innovation is automatic fall detection through motion sensors, which automatically alerts the central station and emergency contacts if a user falls.
- Independent living services refer to the use of motion detectors and sensors placed around the home to monitor movement. Motion detectors and sensors are primarily used in elderly care and are based on microelectromechanical systems (MEMS) such as accelerometers, gyroscopes, and digital compasses, or IR-based technology.

Scope and definitions

Housing type

- **Multifamily dwellings:** Multifamily dwellings include apartments, flats, villas, condos, terraced housing, high-rise apartment flats, and all other semi-detached housing units. Typically, the dwellings are rented out and managed by a landlord.
- **Single-family dwellings:** Single-family is defined as a freestanding, detached dwelling unit, typically built on a lot larger than the structure itself, resulting in an area surrounding the house.

Route to market

- **Multiple-system operator (MSO):** This category includes telecom, broadband, and cable and satellite TV/internet providers. Examples include AT&T, Comcast, DirecTV, and Time Warner Cable.
- **Security provider:** For these companies, such as ADT, traditional security is the primary business line.
- **Retail:** These are off-the-shelf smart home solutions that are typically marketed for DIY installations. Examples include Samsung SmartThings, Wink, and Lowe's Iris.
- **Builders:** This category includes home builders and renovators. Examples include the National Association of Home Builders (NAHB), Brookfield Residential, and Lennar.

- **Utilities:** Utilities that provide a smart home system directly are considered in this report. Utilities that incorporate existing smart home systems in demand response solutions are not included.
- **Other:** This category includes insurance companies, multifamily (in-unit only excludes common areas), general contractors, and specialists (such as Control4 or Savant).

System type

- **Professional:** Includes all professionally installed and monitored devices
- **DIY:** Includes devices that are installed and monitored by the end user (non-professional)
- **Hybrid:** Includes one of either professional installation with end user monitoring or end user installation with professional monitoring

Scope and definitions

Network controllers

- **Professional hubs/panels:** Includes controllers from professional installed systems, such as Qolsys panels or 2GIG panels
- **DIY hubs:** Includes all hubs and gateways for consumer devices, such as Samsung SmartThings, Wink, Arlo hub, Philips Hue hub, and many more

Scope and definitions

Connectivity type

- **Bluetooth Smart:** Includes ICs that operate using the single-mode Bluetooth Smart protocol as defined by the Bluetooth v4.0 specification or subsequent revisions. This category does not include Bluetooth chips that use Bluetooth Classic (version 2.1 + EDR) or dual-mode Bluetooth Smart Ready protocols.
- **DECT ULE:** Digital Enhanced Cordless Telephone (DECT) was specified by ETSI in 1993 and has now been approved for use in 110 countries. DECT ULE is an extension of the CAT-iq standard, building upon previous generations of DECT/CAT-iq products. DECT ULE is an extension to the DECT standard, offering low-power operation for a range of applications, including battery-powered wireless sensor and actuator networks. It operates in the 1.88–1.93 GHz licensed frequency band.
- **EnOcean:** EnOcean is a self-powered wireless technology, operating in the 868 and 315 MHz frequency bands. It enables wireless sensors to draw the required power to operate from their surroundings, from sources including linear motion, light, and differences in temperature. The ambient energy obtained in this way is sufficient to send a wireless signal.
- **Zigbee and Zigbee PRO:** Zigbee is a standards-based wireless platform, positioned to provide for the needs of remote monitoring and control applications in commercial and residential environments. Development of Zigbee started in 1998, with the first Zigbee specification ratified on November 14, 2004. In June 2005, the first version was available for the public. The initial solution consisted of two devices: a microcontroller and a Zigbee RF interface. In 2012, the latest Zigbee PRO specification was announced; it added some improvements and additions to earlier specifications of the technology. Some of the main enhancements included support for Zigbee Green Power, which allows Green Power devices to use and control Zigbee PRO nodes, and the addition of frequency agility as a standard.
- **Z-Wave:** Z-Wave is a proprietary wireless communication standard designed for home automation applications. Z-Wave is a mesh networking technology with each node or device capable of sending and receiving control demands. A Z-Wave network can consist of up to 232 devices, although there is the option of bridging networks if more devices are required. The Z-Wave protocol is designed to run at 9.6 kbps and can easily be supported in battery-operated and mains-connected devices.
- **Thread:** Thread uses 6LoWPAN, carries IPv6, and runs on 802.15.4 silicon. Any low-bandwidth application layer that can run over IPv6 is compatible.

Scope and definitions

- **HomeKit:** HomeKit is a framework for communicating with and controlling connected accessories in a user’s home. It can enable users to discover HomeKit accessories in their homes and configure them or to create actions to control those devices. Users can group actions together and trigger them using Siri. It is built for Wi-Fi and Bluetooth devices; however, another device can be connected but must have a chip approved by the Made for iPhone/iPod/iPad (MFi) program.
- **KNX:** KNX is a standardized (EN 50090, ISO/IEC 14543), OSI-based network communications protocol for building automation. The center frequency is 868.3 MHz.
- **Insteon:** Insteon enables simple, low-cost devices to be networked together using powerline, radio frequency (RF), or both. On powerline, many Insteon devices are compatible with legacy X10 devices.
- **Wi-Fi:** Wi-Fi allows electronic devices to connect to a wireless LAN (WLAN) network, mainly using 2.4 GHz and 5 GHz, and is any WLAN based on the Institute of Electrical and Electronics Engineers' (IEEE) 802.11 standards.
- **ANT/ANT+:** ANT technology is a proprietary wireless networking protocol that uses the unlicensed 2.4 GHz ISM band. ANT+ refers to an interoperability function added to the base ANT protocol to enable “off-the-shelf” interoperability from a range of suppliers.
- **ANT | Bluetooth Smart:** This category consists of combo chips that contain both ANT/ANT+ and Bluetooth Smart software stacks. These dual-stack ICs are commonly used in sport and fitness and consumer medical devices to maintain backward compatibility with ecosystem devices that only use ANT/ANT+.
- **SA100.11a:** ISA100 is an open-standard wireless technology from the International Society of Automation (ISA). In 2007, plans were announced to ensure WirelessHART could be accommodated, and eventually integrated, within the ISA100 standard. In 2008, ISA began standardization of SP100.11a (ISA100), a wireless industrial-automation system based on 6LoWPAN. In May 2009, the ISA100 Standards Committee (part of the ISA) voted to approve ISA100.11a, and in September 2009, ISA100.11a was officially released.
- **Low-power Wi-Fi:** Per the Omdia definition of low-power Wi-Fi, its power consumption must be comparable to other low-power wireless solutions such as Zigbee and Z-Wave. Although “traditional” Wi-Fi solutions are optimized for fast response, low latency, and high data rates, low-power Wi-Fi solutions are optimized for low power consumption, particularly when the device is in standby mode. Low-power Wi-Fi minimizes power consumption when data is not being transferred. After an initial set of tasks associated with startup, a low-power device spends most of its time asleep. The device must wake up periodically to support various application-related and network-related tasks.

Scope and definitions

- **WirelessHART:** WirelessHART, released in 2007, is an open and interoperable wireless communication standard designed to address industrial process and control applications. In March 2010, the WirelessHART specification was approved in full by the International Electrotechnical Commission (IEC). In July 2010, the HART Communication Foundation announced that the WirelessHART specification had also been approved by the European Committee for Standardization as a European National Standard.
- **Zigbee:** GreenPeak announced in September 2012 that it had developed a dual protocol that combines Zigbee RF4CE with Zigbee IP/Zigbee PRO protocols. The aim of this IC is to provide dual connectivity in a gateway-type device with one IC that can allow it to interact with and be connected to both Zigbee RF4CE networks and Zigbee PRO networks in the home (for example, a home automation network). Omdia predicts these ICs will be used solely in gateway devices.
- **Zigbee RF4CE:** In 2008, the RF4CE Consortium was formed, consisting of Phillips, Samsung, Sony, and Panasonic alongside semiconductor companies Freescale, Texas Instruments, and OKI Semiconductor. The aim was to develop an IEEE 802.15.4-based standardized specification for RF-enabled remote controls for a variety of home entertainment devices. In March 2009, the RF4CE Consortium and the Zigbee Alliance reached an agreement to co-develop RF4CE as part of the Zigbee Alliance's range of solutions. The Zigbee RF4CE specification was released in March 2009 and become publicly available in September 2009. The Zigbee RF4CE specification lifts off some networking weight and does not support all the mesh features, which are traded for small memory configurations for lower cost devices, such as remote control of consumer electronics. Zigbee RF4CE is not interoperable with other existing Zigbee network layers, including Zigbee PRO.
- **Zigbee SE2.0:** Zigbee SE2.0 is an evolution of the Zigbee SE 1.x profile aimed at providing connectivity in smart meters, which are being deployed worldwide. In March 2013, the Zigbee Alliance released the specification for the Zigbee IP stack, which was designed to exclusively support the Smart Energy 2.0 (SE2.0) profile. Zigbee SE2.0 brings several additional features, including the ability to individually address nodes in the network as each node has its own IP address.
- **GHz/agnostic/other:** This category includes proprietary protocols that operate in the universal, unlicensed 2.4 GHz band and are not represented in other categories. This category also includes agnostic devices (those which can use any protocol type), as well as protocols not represented in other categories.
- **Other sub-GHz:** This category includes low-power wireless protocols that operate in the sub-GHz bands and are not already represented in other categories. These are typically proprietary protocols operating in regional unlicensed ISM bands, such as the US 315 MHz, the Japanese 920 MHz bands, or the European 868 MHz band.

Appendix

Further reading

[*Smart Speakers Report – 2020 Analysis*](#) (January 2021)

[*Smart Home Leaders 2021: Google*](#) (August 2021)

[*Smart Speakers Market Tracker – 2Q21 Analysis*](#) (July 2021)

[*Consumer and DIY Video Surveillance Report*](#) (January 2021)

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Appendix

Omdia Consulting

We hope that this analysis will help you make informed and imaginative business decisions. If you have further requirements, Omdia’s consulting team may be able to help you. For more information about Omdia’s consulting capabilities, please contact us directly at consulting@omdia.com.

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