

2024 year of the smart home

The smart home will finally arrive in 2024. Today, there are many cheap microchips, excellent broadband and Wi-Fi networks, and many affordable smart home products. A new smart home standard, Matter, improves the ease of use while the desire to lower energy consumption is a killer application. Telecom operators could benefit through resell agreements



Introduction

Some 30 years after the 'House of the Future' was built in the South of the Netherlands - a project which employed smart systems and devices, including voice technology - we are finally ready to declare that mass adoption of the smart home is on the way. This is because a number of developments are finally coming together. The problem with the smart home and smart gadgets for some time now has been that the different devices, such as smart lamps, detection devices and cameras, did not work together, while the functionality of an integrated user interface was limited, also because the number of devices in houses was limited. Now, all of this is changing. There is a lot of (relatively) cheap gear, good user interfaces, and also a killer application to give customers the ability to better control energy use at home. Most importantly, there is also a new standard setting the scene: Matter, which greatly enhances the eco-system of smart home tools.

Cheap semiconductor sales are rising strongly

Let's start by discussing the greatly improved availability of affordable smart home gadgets. Every

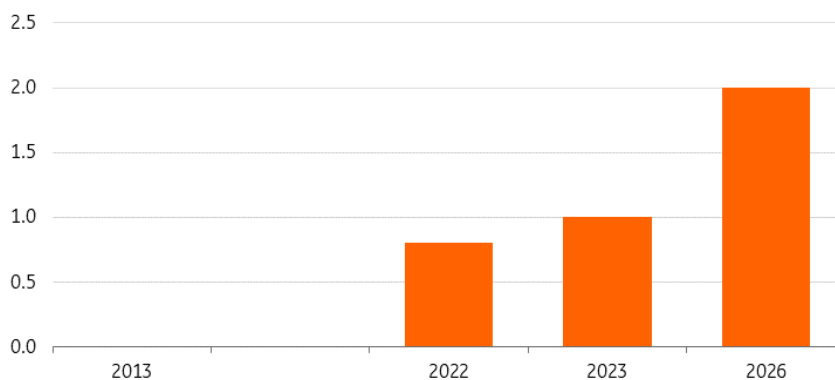
device needs a microcontroller and a means to communicate. Any smart home device therefore has a small microprocessor system that is also capable of communicating by using, for example, a Wi-Fi or Bluetooth protocol. It is here where, over a decade ago, the ground was laid for the boom in smart devices. New products have been developed based on an ESP8266/ESP32 or ARM Cortex processor architecture. This architecture provided a cheap building block that became the foundation of many devices. As can be seen in the graph below, the number of ESP8266/ESP32-based systems that are cumulatively manufactured is expected to double in three years to two billion devices in 2026, up from nothing in 2013.

Stable networks are common today

At the same time, the quality of fixed network connections has improved, including enhanced indoor Wi-Fi through mesh networks. Reliable, high bandwidth networks are a condition for the acceptance of wireless control of domestic appliances because customers do not like the inability to connect to tools providing basic functionalities, such as controlling the room temperature or lighting systems. Moreover, the availability of high mobile data bandwidth gives customers the ability to see what's on the cameras in their homes: functionality that is in demand as can be witnessed on the streets where camera-enabled doorbells are becoming ever more frequent. This is also why there is now a wide availability of cameras with large electronics retailers. The quantity of devices is not the only development that matters. The devices need to speak a language that is understood by the main dashboard. This challenge has also been resolved over a year ago, so that manufacturers have had time to develop innovative products, meeting the new standard.

Smart home semiconductor demand explodes

Espressif leads the IoT market with 1bn shipments of ESP8266/ESP32 platform



Source: Espressif, ING

The new standard: Matter

For some time, large technology platforms included dashboards and control panels for the smart home in their software. Examples include Apple's Home Kit, Amazon's Alexa, Google Home, but also the Philips Hue system and Home Assistant, an open-source project with global reach. There were also many companies offering products for the smart home, such as smart lighting solutions from Signify, smart plugs, doorbells, cameras, home audio and smart domestic appliances. Also, Ikea has a wide range of products for the smart home. The interoperability has been greatly improved because of the new standard, Matter. This new standard was designed to enhance the compatibility and interoperability of devices from different vendors. Matter has been developed by

the Connectivity Standards Alliance. Members of the alliance are, for example, Apple, Amazon, Google, as well as Ikea, Schneider, Huawei, Signify, NXP, Infineon, ST Microelectronics, Tuya, Samsung, Resideo and Verizon. Truly an industry-wide group. Devices that are designed according to the Matter standard are interoperable across multiple platforms, removing barriers between multiple ecosystems.

IDC's Worldwide Smart Home Device Forecast by Shipment Volume

Expected shipments in millions

| Device category | 2023 Shipments | 2027 Shipments | 2023-2027 CAGR (%) |
|--------------------------|----------------|----------------|--------------------|
| Video Entertainment | 279 | 306 | 2.4 |
| Home monitoring/Security | 192 | 252 | 7.1 |
| Lighting | 102 | 170 | 13.6 |
| Smart Speaker | 107 | 123 | 3.5 |
| Thermostat | 25 | 30 | 4.5 |
| Others | 153 | 211 | 7.7 |
| Total | 857 | 1,092 | 6.2 |

Source: IDC Worldwide Quarterly Smart Home Device Tracker (June 2023), ING

Shipment volume as expected by IDC underestimates demand for smart home products

We are not alone in expecting strong growth in the market. IDC expects that the market for smart home devices will expand by 6% annually from 2023-2027. Product categories that show above-average growth rates are Home Monitoring (7.1%) and Lighting (13.6%). Nevertheless, we think the figures underestimate the growth in shipments, as the expectations on the expected increase in shipments show, above. If the shipments on the ESP8266/ESP32 platform show, these shipments double until 2026. These microchips are not only used for smart home products. Nevertheless, we think the growth rate of these products is more indicative of the increase in shipments of smart home tools.

Need for energy preservation could be a catalyst

Apart from user friendliness and affordable prices, many citizens are currently concerned with their environmental footprint and their energy use at home. Smart tools offer a great way to monitor one's energy consumption while giving greater control over domestic lighting and heating. This is especially relevant with fluctuating energy prices. Notably, some consumers in the Netherlands are looking to profit from negative electricity prices, using machines that use a lot of energy when prices are negative. Smart home applications can therefore fulfil an important customer need today, beyond the ability to switch devices on and off remotely. Data from a report by Park Associates (on behalf of Resideo) shows that 16% of Americans (with broadband) have a smart thermostat.

Smart homes need to be safe

Besides the need for a great user experience, one likely obstacle to the broad adoption of smart products has probably been safety. Lately, there have been many news stories about insecure devices hosting botnets. Also, devices that use remote cloud server providers host data outside the

home. The Matter standard is focused on enhanced security and local control as is the Home Assistant platform. Apple also has a strict requirement in place for products that want the "Works with Apple Home" badge. Nevertheless, we believe there is scope for a consumer service focused on the secure maintenance of a (separate) in-house network.

Can telecom operators benefit from the opportunities the smart home offers?

What's in it for telecom providers? The smart home is a natural extension of the traditional services of telecom operators: secure communication and often the provision of a media box. So far, some telecom providers are giving advice to customers on the optimal use of indoor Wi-Fi. They sometimes also offer software packages to enhance network safety and sell mobile handheld devices. Now that smart home platforms and smart products look stable and relatively easy to install, we think telecom providers could become resellers of secure smart home devices and possibly services, such as the provision of a smart hub at home, or trusted cloud access. KPN is doing this already, today. In doing so, happy customers are less likely to go to a competitor. Given that churn reduction is the holy grail for the telecom industry, exploring the option of selling innovative services is worth a try.

Authors

Jan Frederik Slijkerman

Senior Sector Strategist, TMT

jan.frederik.slijkerman@ing.com

Diederik Stadig

Sector Economist, TMT & Healthcare

diederik.stadig@ing.com

Disclaimer

This publication has been prepared by the Economic and Financial Analysis Division of ING Bank N.V. ("ING") solely for information purposes without regard to any particular user's investment objectives, financial situation, or means. *ING forms part of ING Group (being for this purpose ING Group N.V. and its subsidiary and affiliated companies).* The information in the publication is not an investment recommendation and it is not investment, legal or tax advice or an offer or solicitation to purchase or sell any financial instrument. Reasonable care has been taken to ensure that this publication is not untrue or misleading when published, but ING does not represent that it is accurate or complete. ING does not accept any liability for any direct, indirect or consequential loss arising from any use of this publication. Unless otherwise stated, any views, forecasts, or estimates are solely those of the author(s), as of the date of the publication and are subject to change without notice.

The distribution of this publication may be restricted by law or regulation in different jurisdictions and persons into whose possession this publication comes should inform themselves about, and observe, such restrictions.

Copyright and database rights protection exists in this report and it may not be reproduced, distributed or published by any person for any purpose without the prior express consent of ING. All rights are reserved. ING Bank N.V. is authorised by the Dutch Central Bank and supervised by the European Central Bank (ECB), the Dutch Central Bank (DNB) and the Dutch Authority for the Financial Markets (AFM). ING Bank N.V. is incorporated in the Netherlands (Trade Register no. 33031431 Amsterdam). In the United Kingdom this information is approved and/or communicated by ING Bank N.V., London Branch. ING Bank N.V., London Branch is authorised by the Prudential Regulation Authority and is subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. ING Bank N.V., London branch is registered in England (Registration number BR000341) at 8-10 Moorgate, London EC2 6DA. For US Investors: Any person wishing to discuss this report or effect transactions in any security discussed herein should contact ING Financial Markets LLC, which is a member of the NYSE, FINRA and SIPC and part of ING, and which has accepted responsibility for the distribution of this report in the United States under applicable requirements.

Additional information is available on request. For more information about ING Group, please visit <http://www.ing.com>.