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MAT-102

Driving Matter Deployment in Non-Consumer Applications

Rob Alexander | August 2023

Outline

- Matter overview
- General Benefits for Non-Consumer Use Cases
- Benefits of Thread
- Building Management with Matter
  - Commercial Buildings
  - Multi-Dwelling Units (MDU)
- Matter Energy Management
- Silicon Labs Matter Solutions

Matter Overview

What is Matter?

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1.1 NOW AVAILABLE

Driving the Matter Standard

amazon · Apple · Aqara · COMCAST · Cync · EATON
Eltako · ESPRESSIF · eve. · Google · IKEA · Infineon
INSTA · Johnson Controls · Kroger · Kwikset · LATCH · LEEDARSON
legrand · LEVITON · ST life.augmented · LIFX Smarter Light · LUTRON · mediola
meross · Midea · nanoleaf · Netatmo · NODON · NORDIC SEMICONDUCTOR
OPPO · Panasonic · PHILIPS hue · REALTEK · resideo · NUKI
NXP · SCHLAGE · Schneider Electric · sengled · SIEGENIA brings spaces to life · Signify
SILICON LABS · SmartThings · somfy · tado° · TEXAS INSTRUMENTS · tp-link
TRIDONIC · tuya · wemo · WiZ · Wulian · Yale
Ankon LIGHTING · YEELIGHT · ZYAX

"Members represented are a small sample of the companies supporting Matter."

- **Developed by over 300 industry-leading companies**
  - Represents value chain from Semiconductor to Ecosystem

- **Simple**
  - Easy to setup and control devices with multiple Ecosystems

- **Interoperable**
  - Devices with the Matter logo are interoperable by design

- **Reliable**
  - Reliable local connectivity works even if internet is down

- **Secure**
  - Authentication before joining and encrypted data transfer

- **Open**
  - The specification and software is open and Based on IP connectivity

Matter Devices

Devices supported by Matter today

LIGHTING & ELECTRICAL

MEDIA DEVICES

CONTROLLERS

BRIDGES

HVAC CONTROLS

WINDOW COVERINGS & SHADES

DOOR LOCKS

SAFETY & SECURITY SENSORS

Device types & category support in development

CAMERAS

ROBOT VACUUMS

AIR QUALITY CONTROL

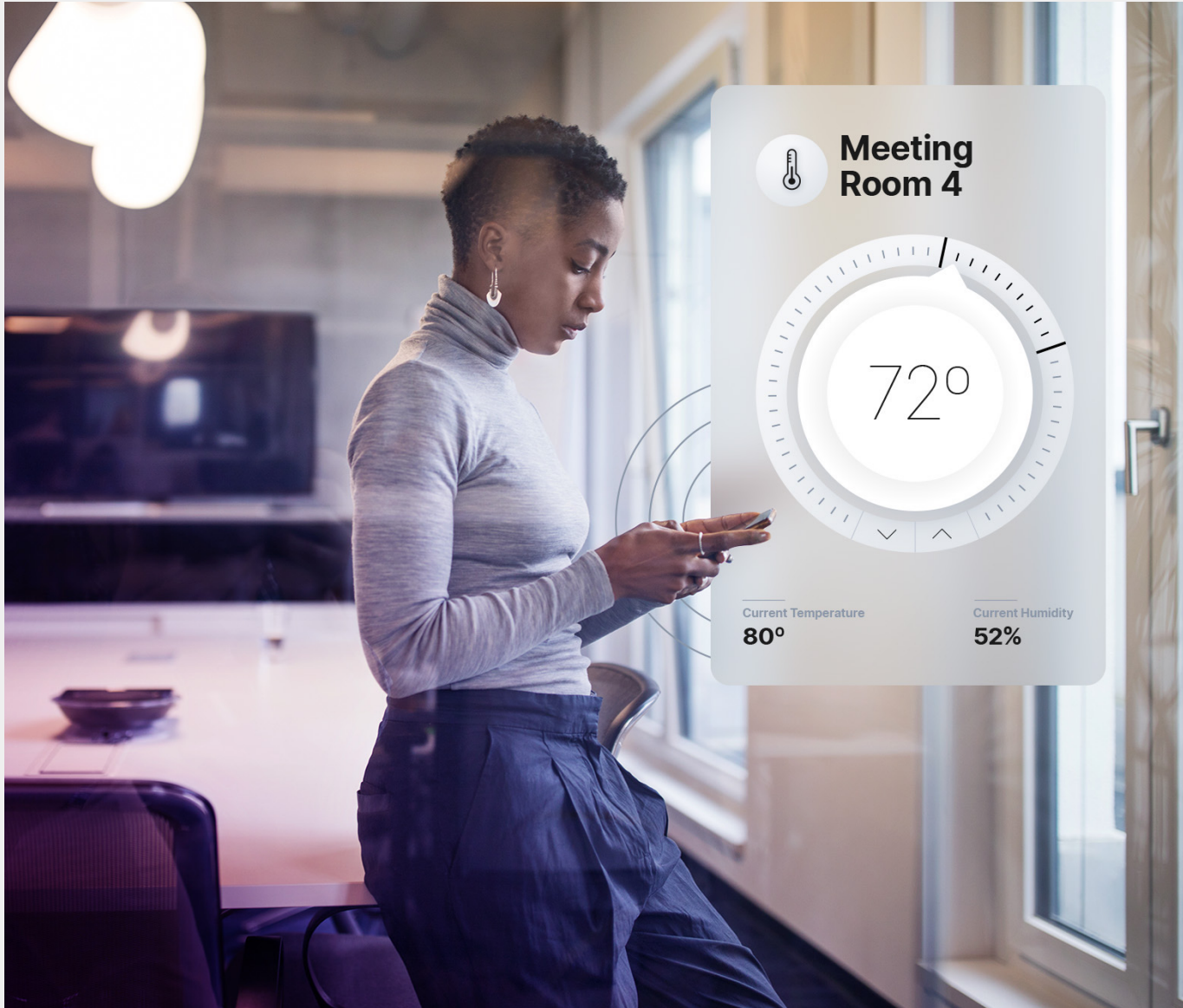### AMBIENT PRESENCE SENSING

WHITE GOODS (APPLIANCES)

ENERGY MANAGEMENT

SMOKE & CO DETECTION

ACCESS POINTS

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Matter Benefits for Non-Consumer Use Cases

Meeting Room 4

72°

Current Temperature
80°

Current Humidity
52%

- **Provisioning**
  - Built for mobile commissioning
  - Does not require an Internet connection
  - Validates the manufacturer and certification of the device
  - Uses certificates for operational security

- **Non-Matter Device Interactions**
  - Existing IP networks can be used for a mix of non-Matter and Matter devices
  - Non-Matter devices can be connected through the use of bridges to allow new integrations with voice assistants or mobile phones
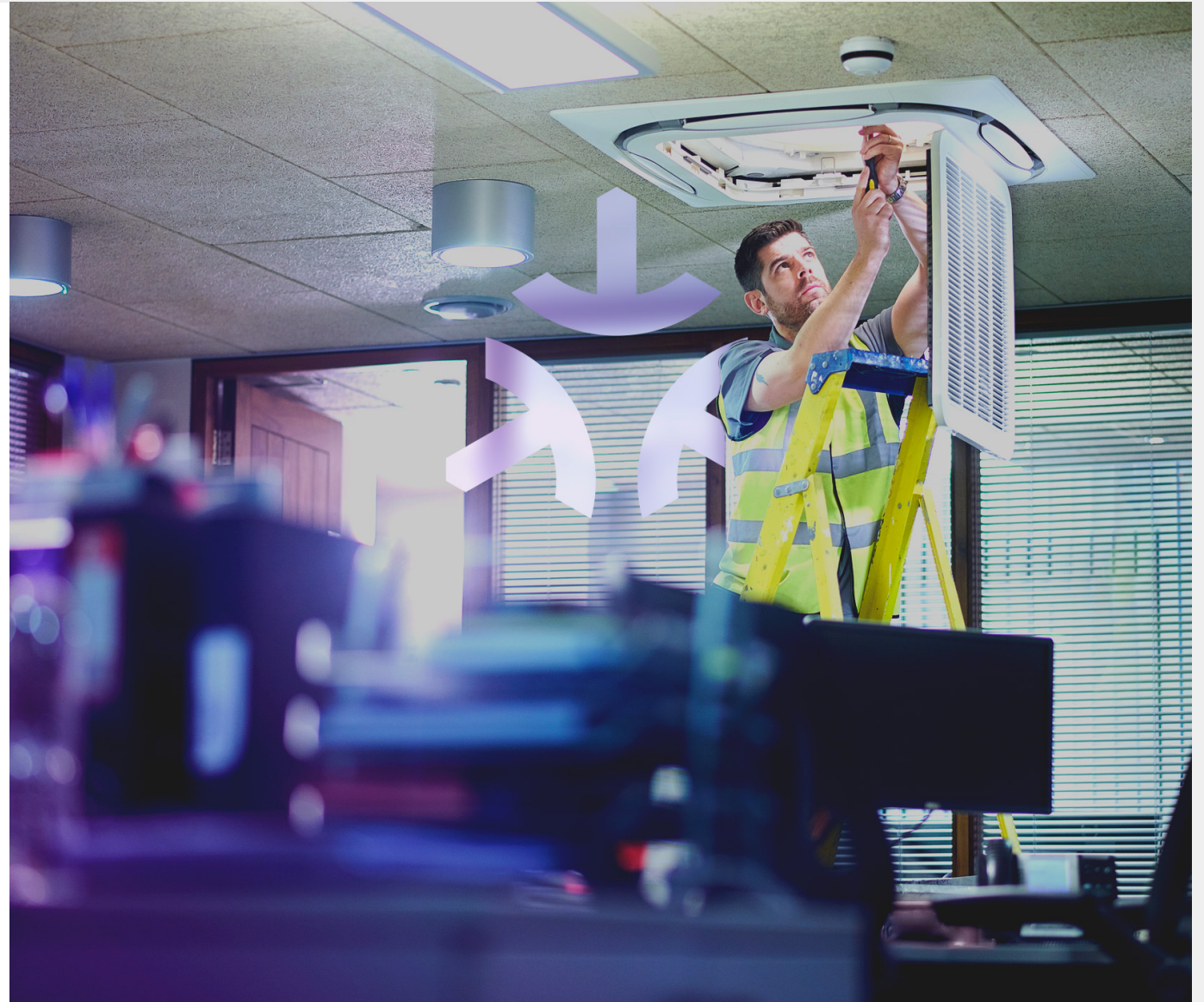   - Office space that could allow for occupants to open doors or simply change the comfort level in their offices

Matter Benefits for Non-Consumer Use Cases (continued)

- **Pre-provisioning the infrastructure**
  - Matter devices can be pre-installed with operational parameters and then installed into the building later
  - Matter Thread is a great mechanism for building an organic network without large infrastructure
  - Device to device communication is possible and can be expanded in the future

- **Overall**
  - Can create a complete system where the devices can be owned and managed by a separate entity than the users
  - Matter standard and SDK is owned maintained by a non-profit standards development organization (SDO), known as the CSA.
  - CSA continues to add new device types and features twice per year, Spring and Fall. Silicon Labs interested to help bring your device type to life.
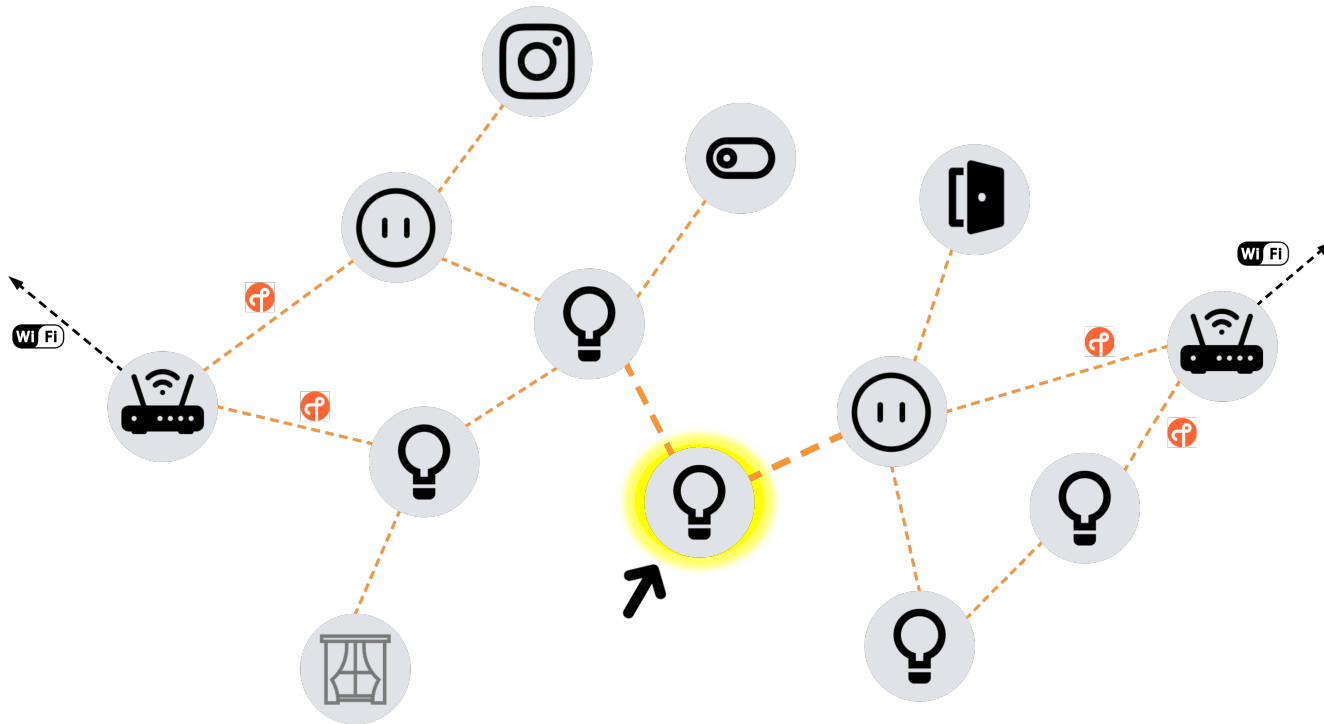
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Benefits of Thread

Thread Networks

- **Thread as a standard was released in 2015 and has had 3 major iterations**

- **IPv6 based and designed for low power IoT**

- **Thread has a mesh network design**

- **Thread networks are self-healing and largely support the ability to manage themselves**

- **Thread networks can be extended or cascaded using standard IP mechanisms to allow a building wide network**

- **Define a dedicated border router to allow transition between Wi-Fi or Ethernet, and native Thread devices**

- **Implementation is open-source with support by multiple chipset vendors including Silicon Labs**

Thread Network Merging and Redundancy

- Additional router nodes can be added at a lower cost vs. dedicated Wi-Fi access points

- A routing Thread device does not have to be a dedicated device and still run its normal IoT function

- Routers can merge the islands deployed in a building to provide additional redundancy, lower latency, and broader coverage

- Thread Network segments can be independently setup to access the broader local network and Internet

Building Management with Matter

Matter and Walled Gardens

- **Walled gardens provide isolation and protection for key systems**

- **Matter provides a large benefit as a standardized device element to walled ecosystems**

- **Matter still lets you have control with walled gardens limiting additional fabrics or devices based on policy**

- **Ultimately still puts control in the hands of the admin**

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Considerations for Commercial Building

Retrofit is a common consideration for buildings

- **Interoperable Wireless technology is going to be key**

Multiple entities / interested parties are impacted

- **Building owner, System Integrator, IT manager, and tenant**

Multiple systems including Water, Air, Gas, Electric, Steam

- **Managed with 1 or more management systems**

Overlap with Commercial and Consumer Products

- **Products built for Industrial or Commercial can sometimes be resold for residential**

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Commercial Building

- **Commercial Building Management will benefit from Matter Device types given the integration with IP**
  - Buildings have numerous technologies that require systems integrators to manage and understand a broad swath
  - IP provides a baseline of interoperability

- **Matter Bridges provide translation to non-Matter systems allowing isolation and controlled interactions**
  - **Example:** Security systems can use proprietary sensor networks but can enable automations for Matter enabled lights

- **Matter provides multi-fabric capabilities that can enable multiple systems to interact with a device**
  - Still provides high level of security requiring an admin to enable the device to be commissioned by another fabric

- **Matter Thread devices can function without connectivity to the broader building network**

- **Matter is a local area network and does not require Internet access**

Matter Network

Ceiling Lights
Shutting Off

45%
↓

Proprietary Network

Wall Sensor
Motion: Not Detected

Contacting...
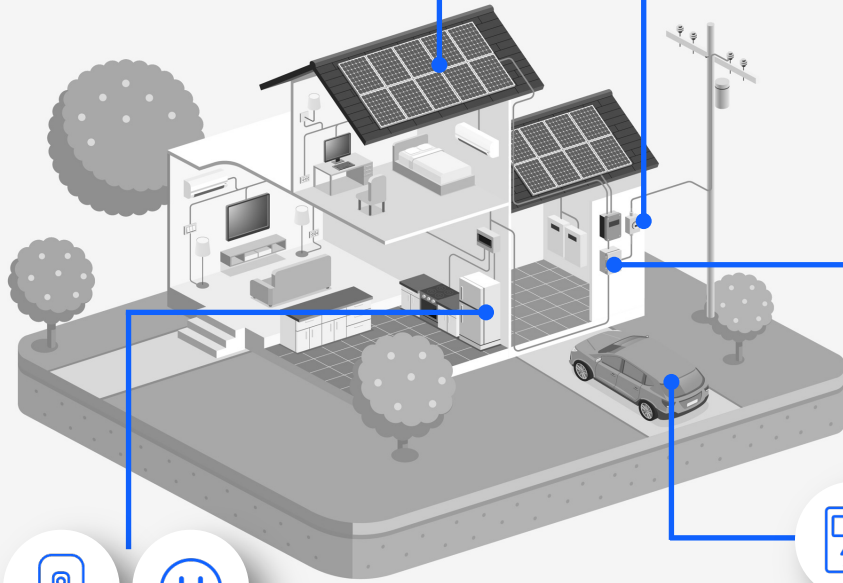Lights

Multi-Dwelling Units (MDU)

- **Multiple systems that want to enable IoT**
  - Wi-Fi Internet access
  - Lighting infrastructure
  - HVAC Control
  - Security Systems and monitoring

- **Tenants may want to integrate their own consumer devices**
  - Bring your own IoT Device

- **Multi-fabric enables sharing device management between tenant and owner systems**

- **Broader device selection than most single providers can build**

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Matter Energy Management

Energy Management

Panel-level Optimizers, Microinverters

Smart Meter

Inverter

Storage

Residential Loads / Devices – boilers, sockets, demand response

High-level Use Cases

- **Energy Monitoring – Balancing, Diagnostics, Insights**

- **Self-suffiency – Maximizing Self-consumption**

- **Fuse Protection – Capacity not exceeded**

- **Tarriff based decisions – Shifting off from peak hours, Time-of-use, Incentives**

- **Peak Shaving & Demand Response – Reduce peak loads, match consumption with production**
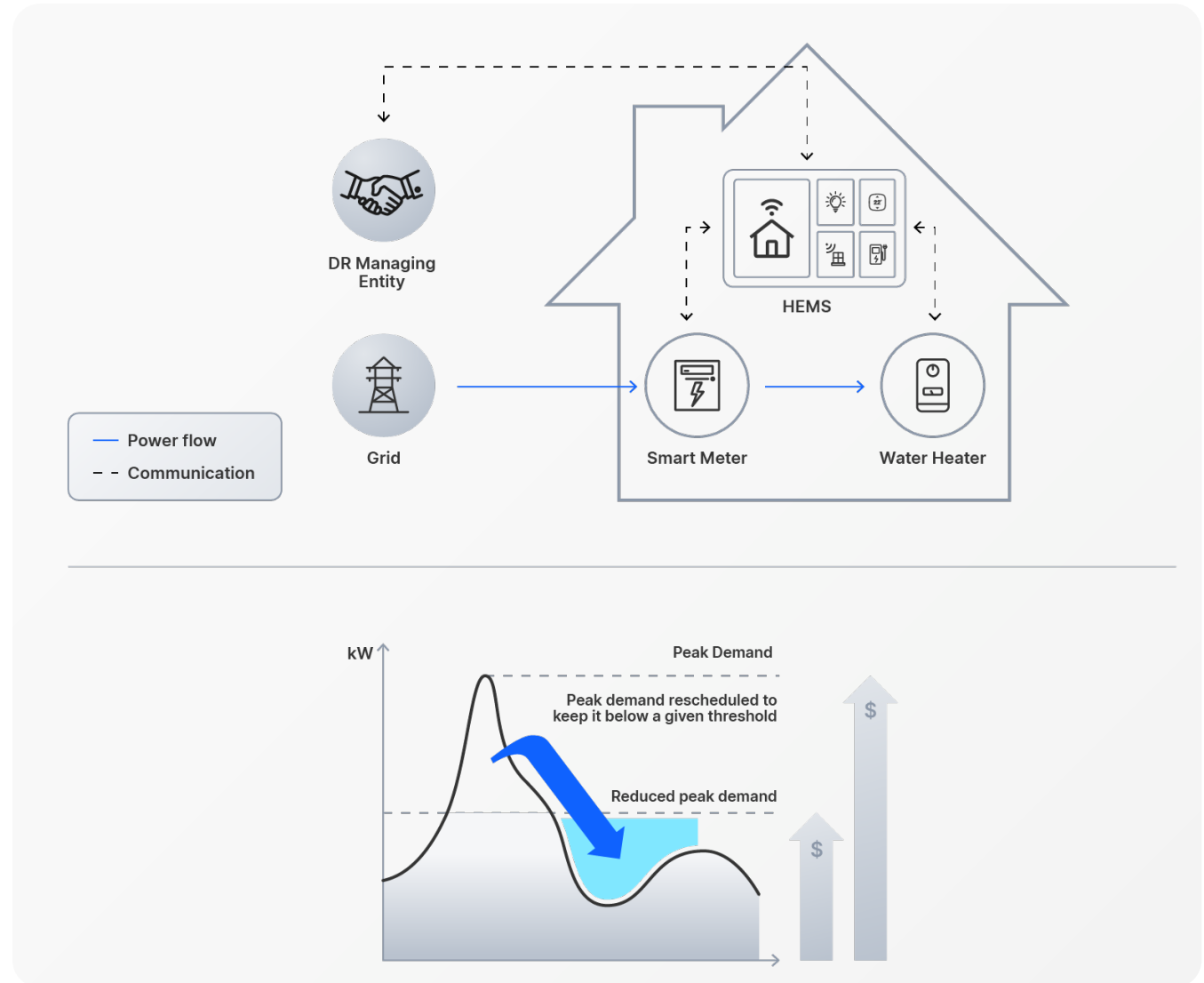
Demand and Load Control

- **Home load control**
  - Adjust daily use to utilize the available energy and prices
    - ‣ Schemes, time-of-use adjustments
  - Move demand to off hours – water boilers, heating, pool pumps, appliances etc.
  - Load EVs when it is most optimal for the home other consumption
  - Make decisions based on energy spot-pricing

- **Utility-level demand response**
  - Utility to manage the grid utilization based on estimated energy production
    - ‣ Major home loads - EVSEs, HVACs, Heat allocators, water heaters
    - ‣ Incentives for consumers to participate
    - ‣ Specific hardware, or ecosystem like Matter as the enabler
  - DRLC events are pushed to HEMS get the through the internet or from a Smart meter
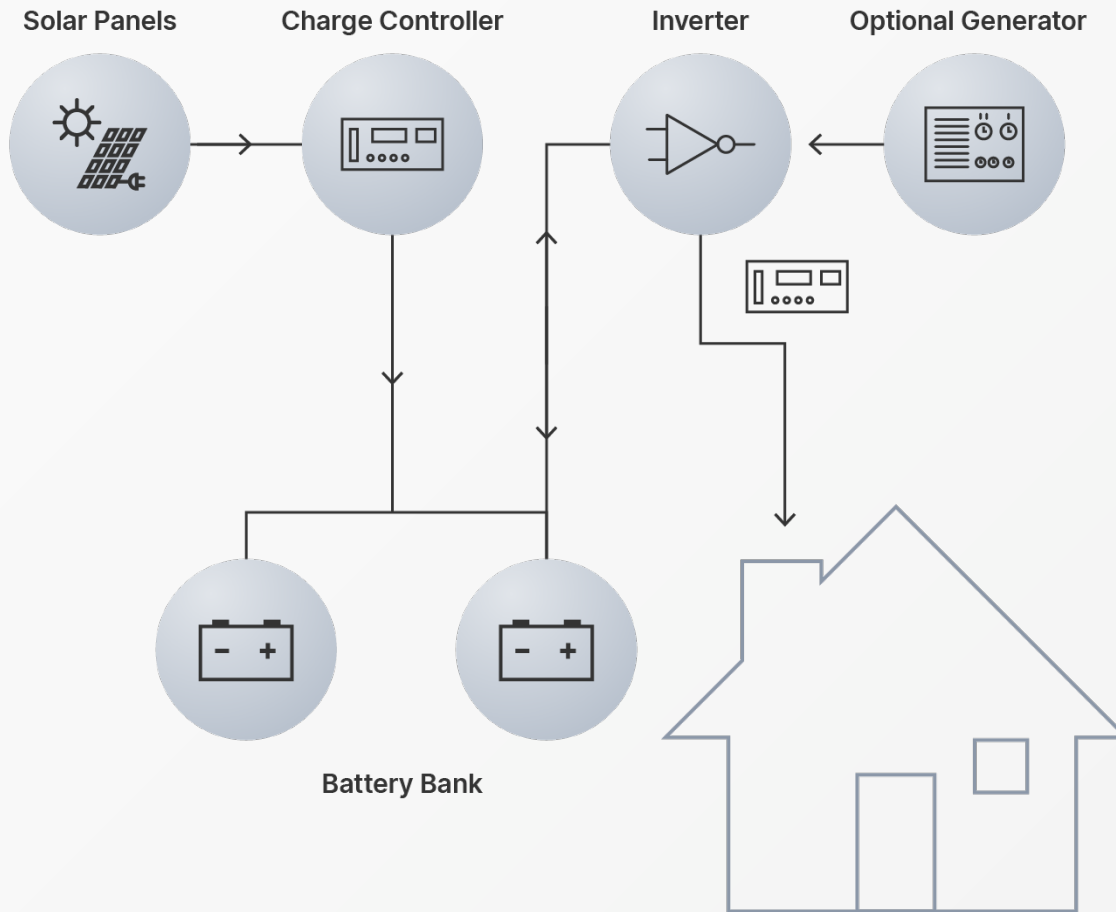
Backup Power

GENERATORS

Backup energy on-demand

Blackout and brownout protection

Connect to the home energy system to enable additional use cases
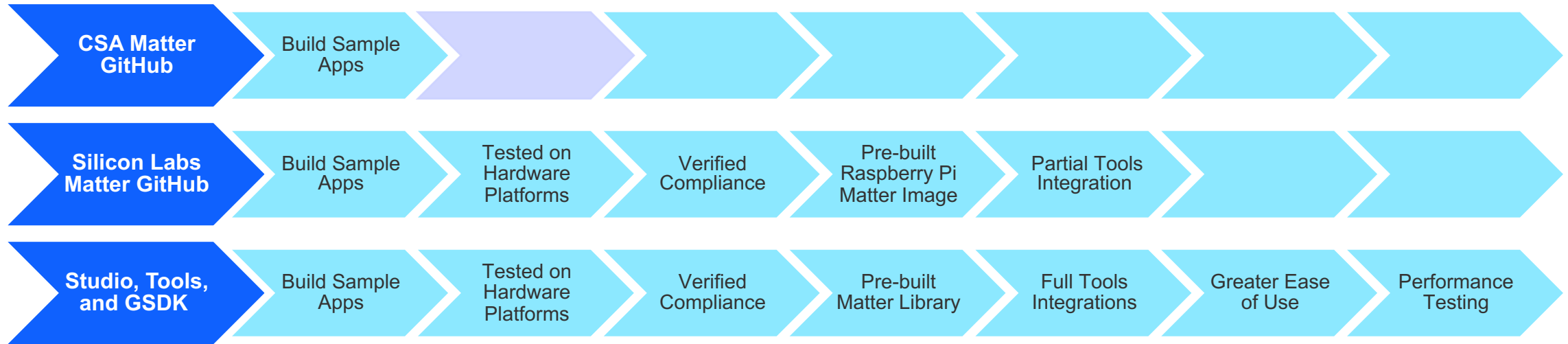

STORAGE SYSTEMS

Store surplus energy

Blackout and brownout protection

Peak shaving, time-of-use, balancing

Matter Enables Multi-vendor Off-grid Solutions

- **For functional off-grid solutions several pieces required**
  - Energy production (e.g. solar)
  - Energy Storage
  - Inverter (DC to AC)
  - Management system to coordinate devices
  - Optional: Managing load based on available energy (appliances, HVAC, lighting, etc.)

- **Matter was created with interoperability in mind**
  - With standardized interfaces companies can focus on creating best products to each function
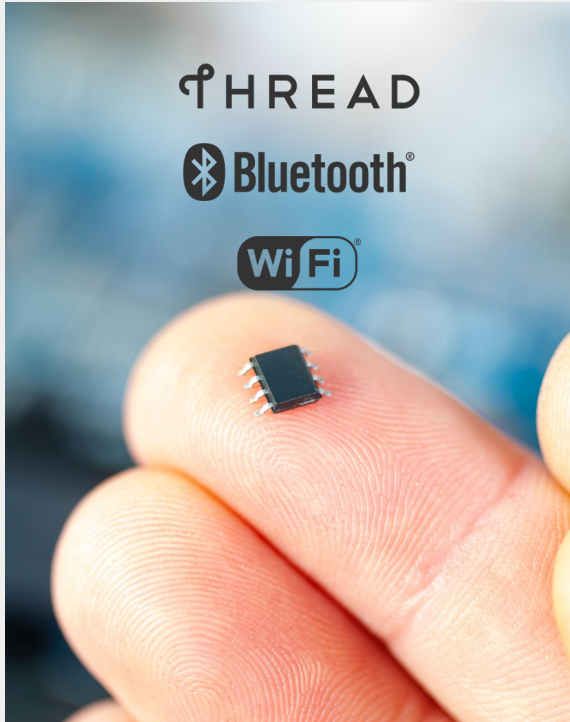 - Customers will eventually win with more options from different vendors

Paths to Matter End Products

CSA Matter GitHub	Build Sample Apps						

Silicon Labs Matter GitHub	Build Sample Apps	Tested on Hardware Platforms	Verified Compliance	Pre-built Raspberry Pi Matter Image	Partial Tools Integration		

Studio, Tools, and GSDK	Build Sample Apps	Tested on Hardware Platforms	Verified Compliance	Pre-built Matter Library	Full Tools Integrations	Greater Ease of Use	Performance Testing

- With CSA's Matter GitHub there are numerous gaps to getting to production.

- Our Silicon Labs Matter GitHub will provide better stability and an easier path, but there will still be gaps.

- Ultimately the Studio, Tools & GSDK path will provide the best possible path for mass market adoption making use of Simplicity Studio and other Developer tools (example: VS Code).
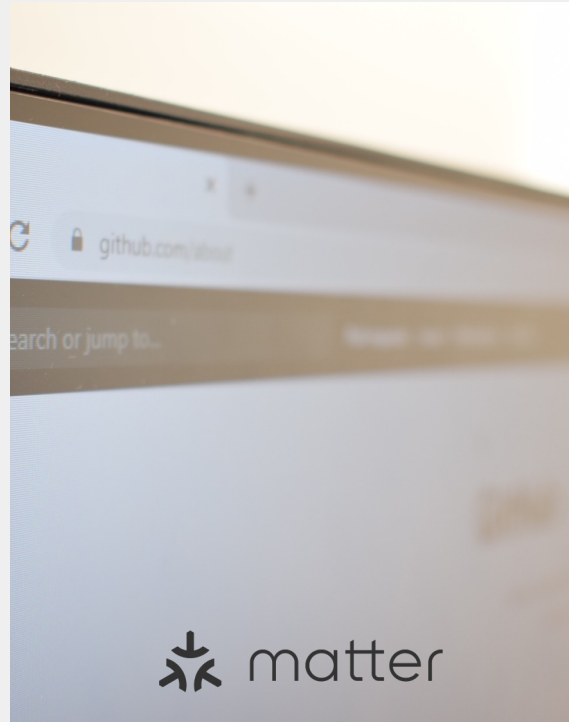
Silicon Labs Matter Solution

HARDWARE

Field Proven SoCs and Modules

Thread, Bluetooth and Wi-Fi

Certified Thread PHYs

SOFTWARE

One-stop-shop for all software

Full featured Matter solution

Built on top of IP stacks

TOOLS

Reference Applications

Command Line Interface support

LCD to display QR code

Studio support targeted Q4 2022

CERTIFICATION

+50,000 Wi-Fi and 802.15.4 end products deployed

Support for end-product certification

Matter certification Fall of 2022

Thanks!