



Communication Technology Nessum WIRE Introduction

**Panasonic Holding Corporation
Nessum Project**

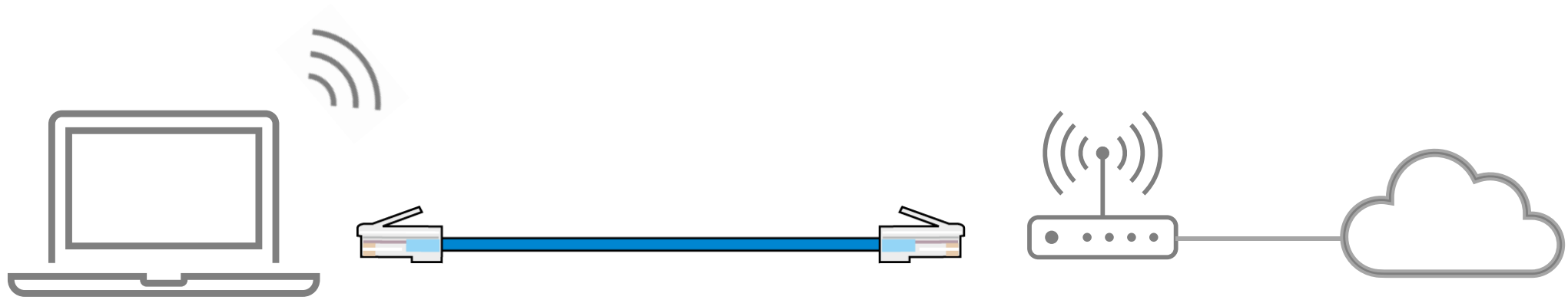
What is Nessum ?



Nessum is a communication technology developed by Panasonic that can be used with various communication media such as wired, wireless, and underwater. It has been internationally standardized as IEEE 1901.

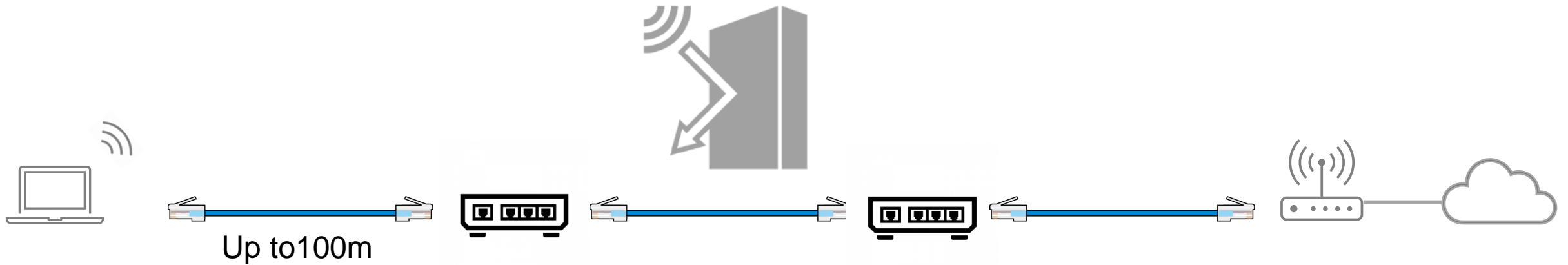


When connecting a PC to the internet,



Wi-Fi or Ethernet cable is usually used.

When constructing a network in a building or factory,



Network construction costs are higher
due to additional wiring and wireless repeaters

Nessum WIRE : Technology to carry data over existing cables



Flat cable



Twisted pair cable



Coaxial cable

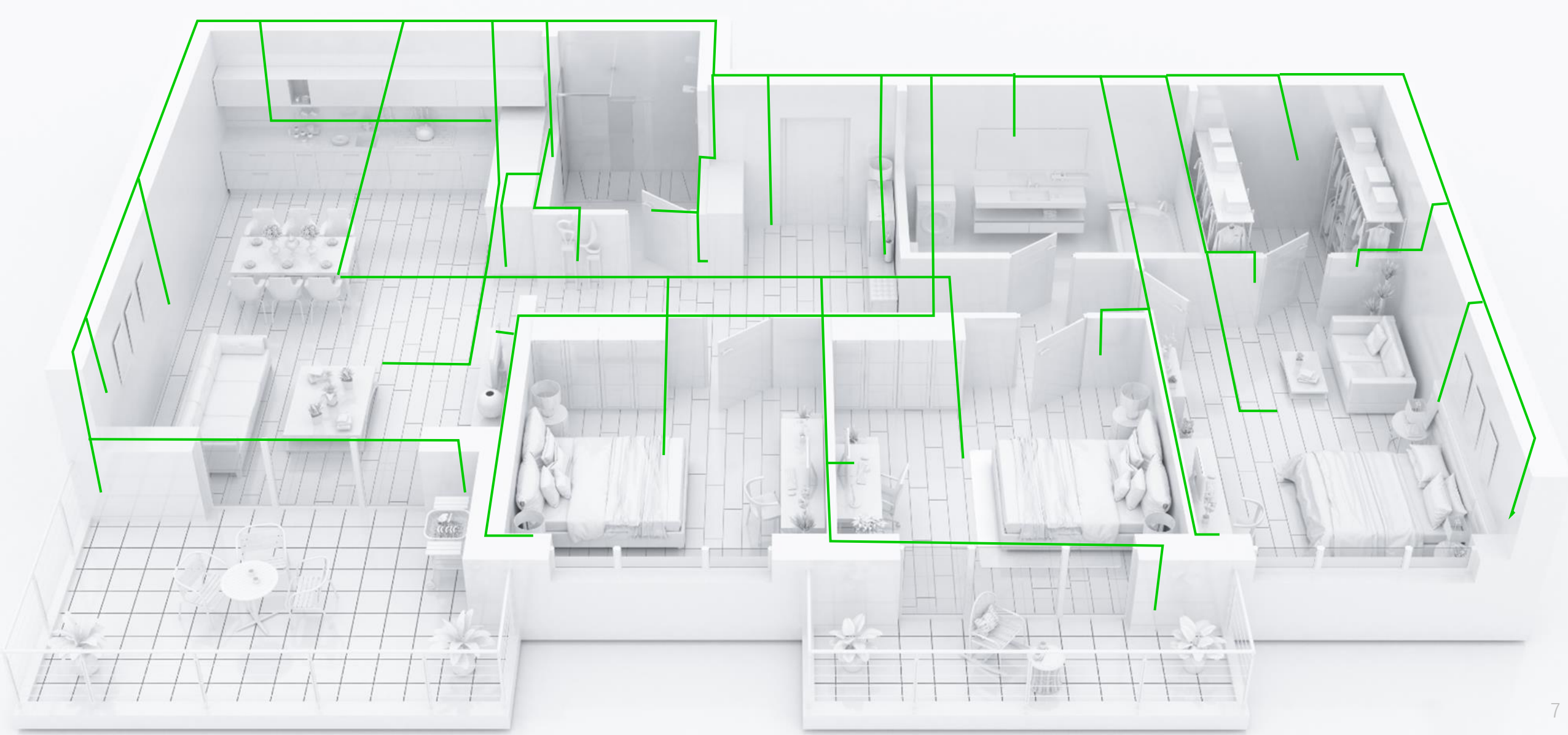


Power line

Various cables are available!



Power line

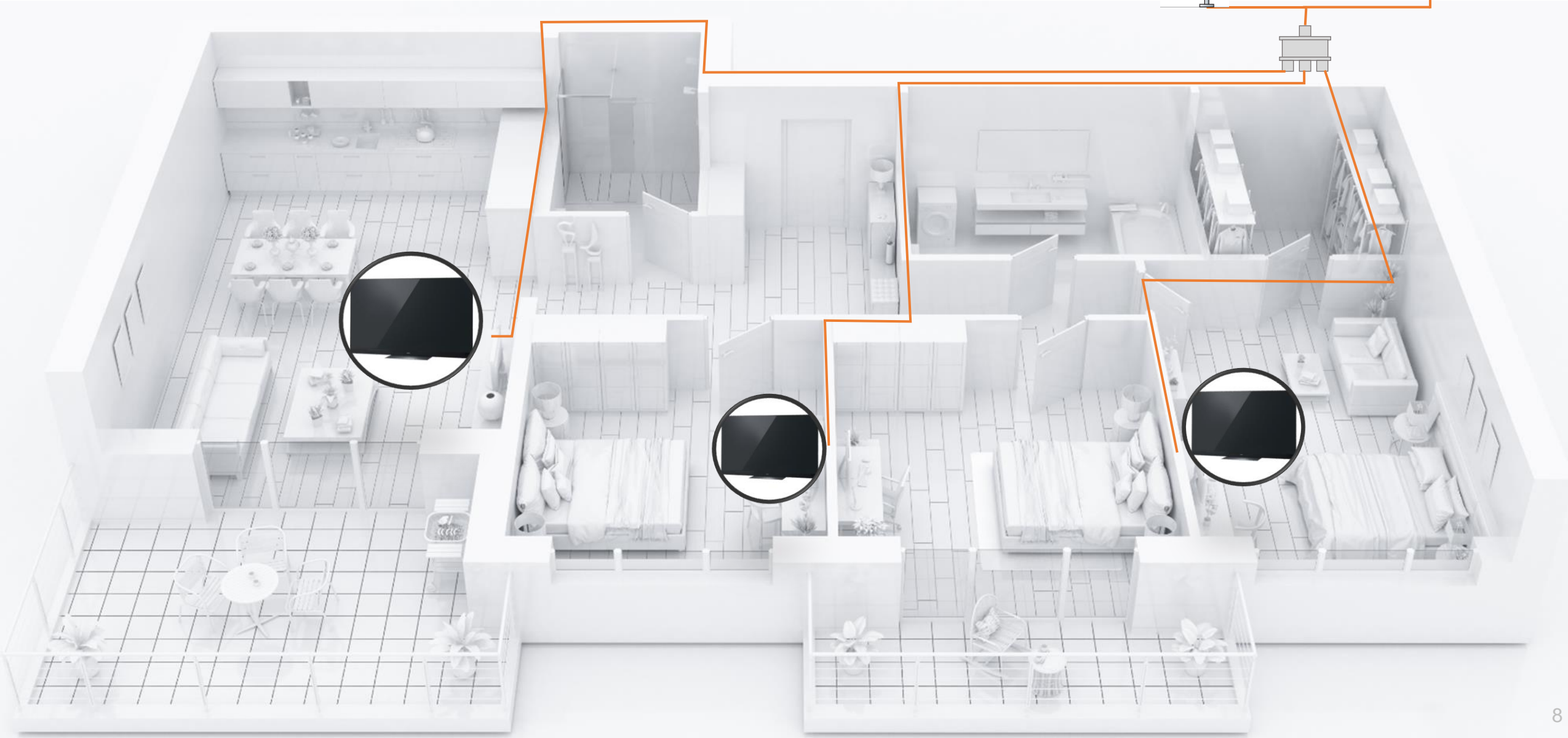




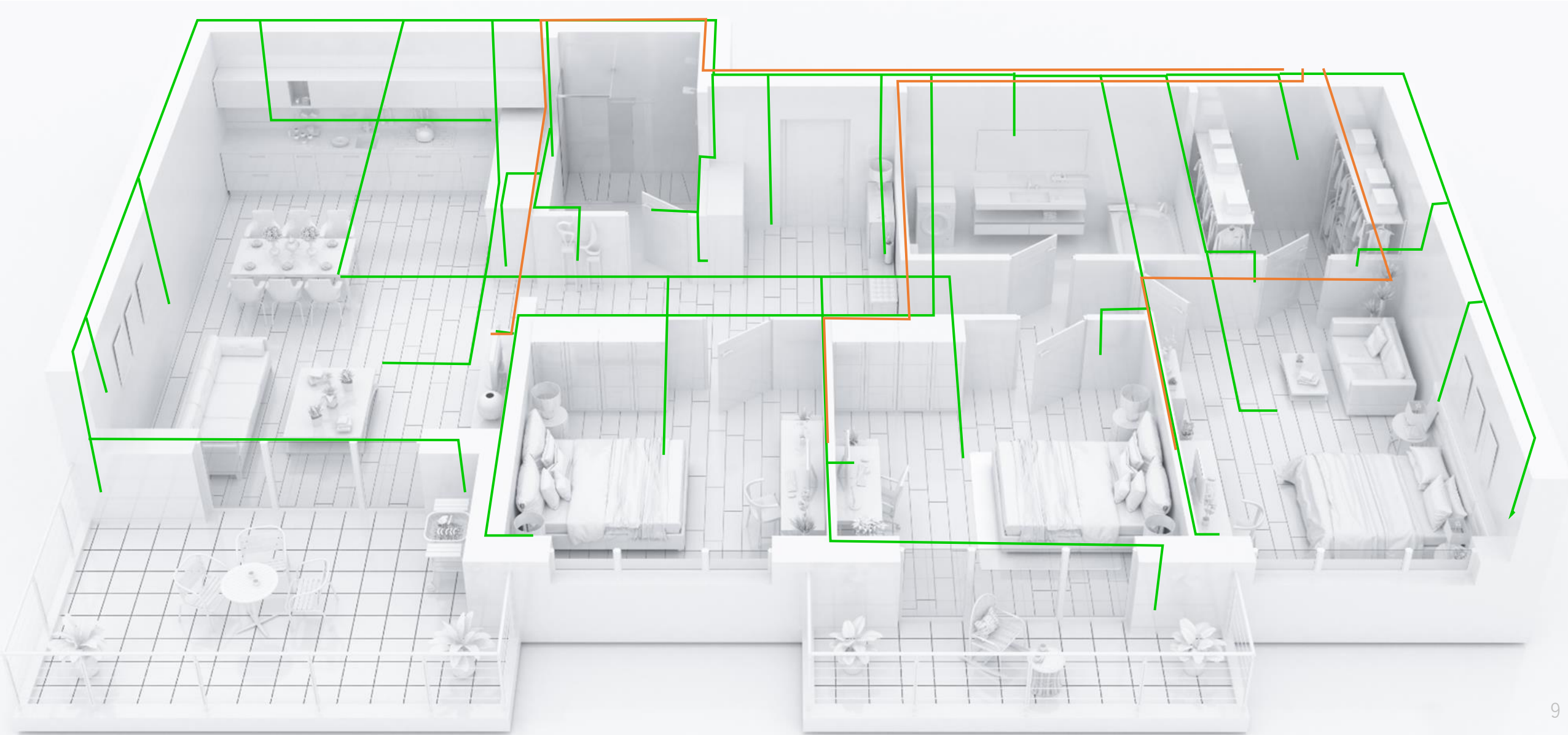
Coaxial cable



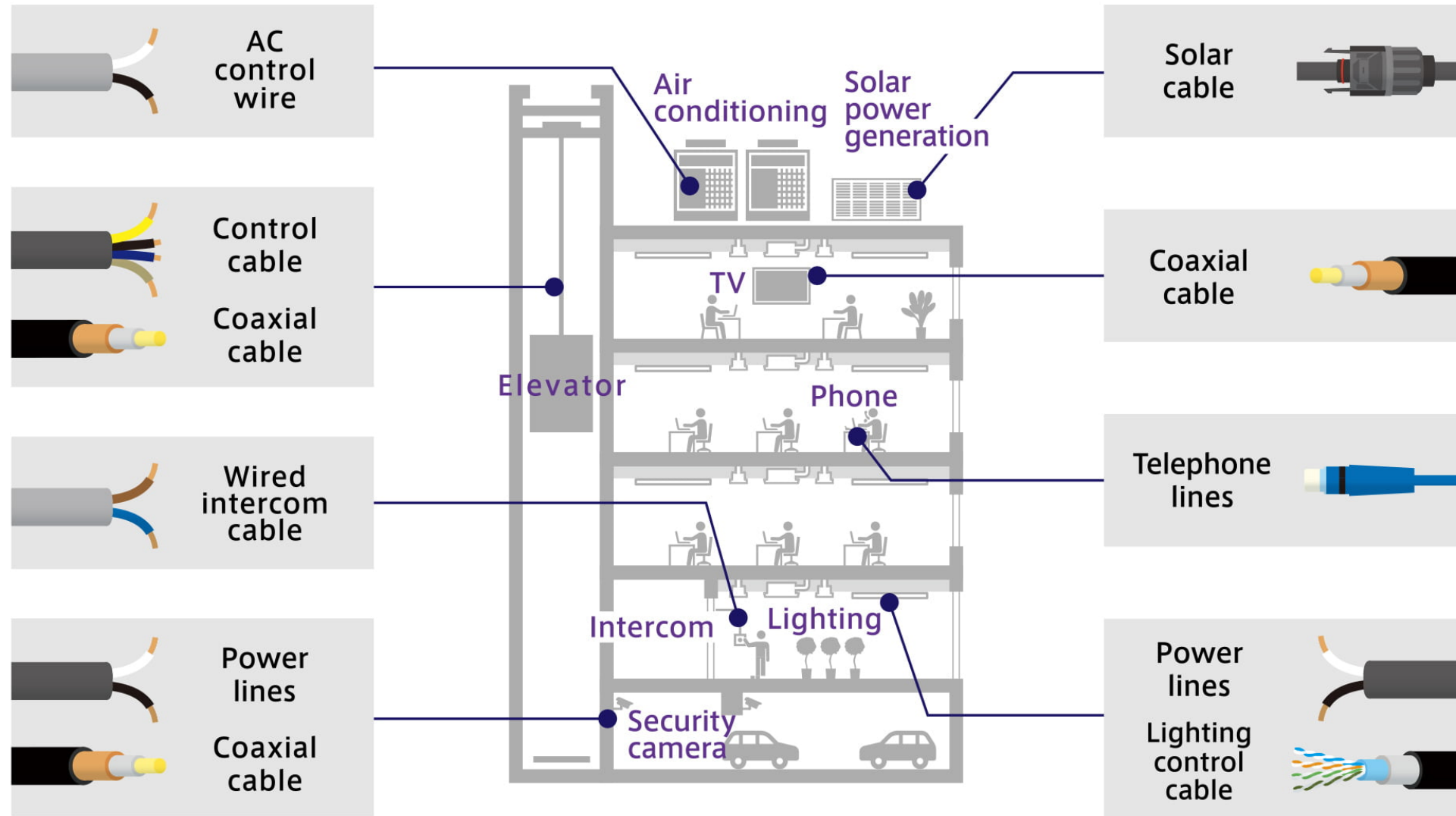
CATV



Nessum WIRE is a technology that upgrades existing cables To communication cables.



A technology to update existing lines, not limited to homes



3 Main Features

Large Scale Network



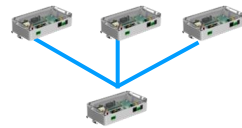
Master



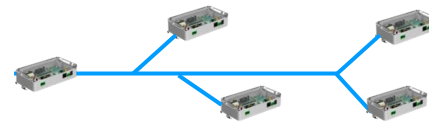
Up to 1024

Terminals

Free Topology



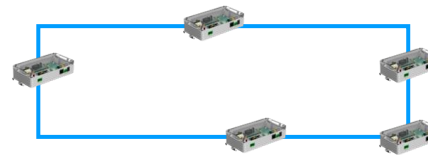
Star



Tree



Daisy chain



Ring

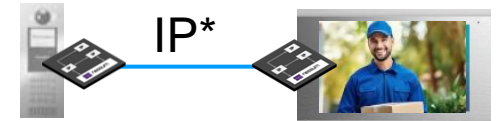
IP Communication



analog



Nessum LSI inside

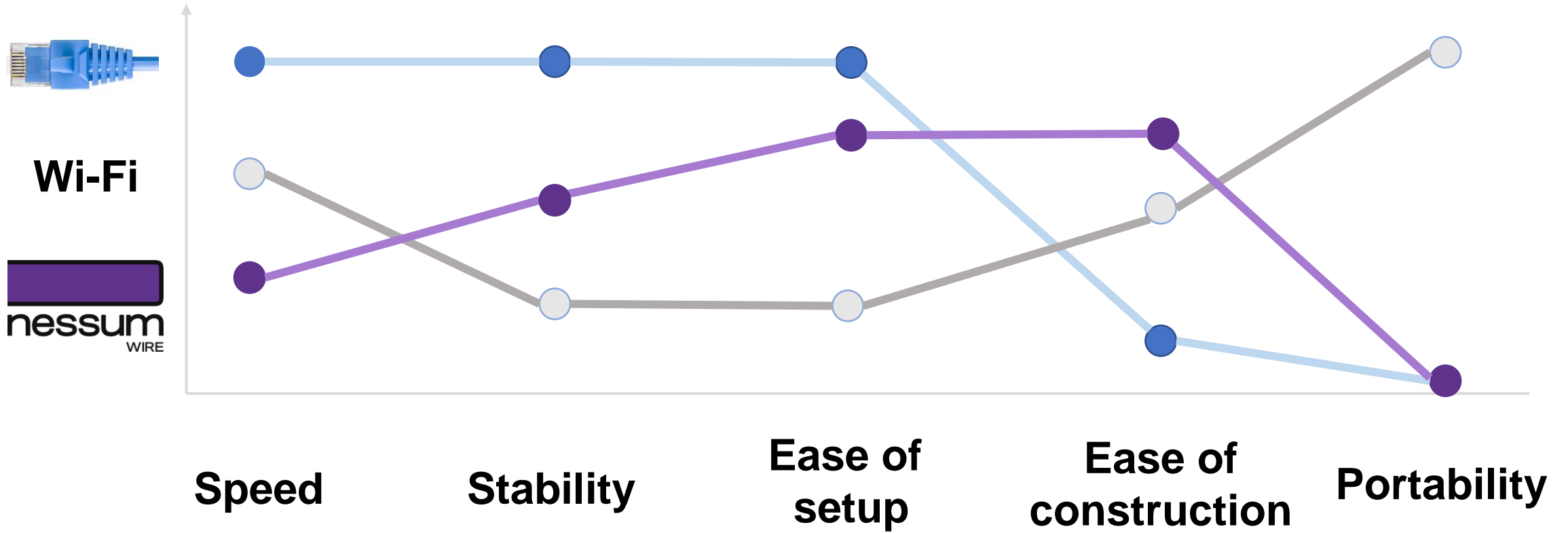


IP*

with the same cable

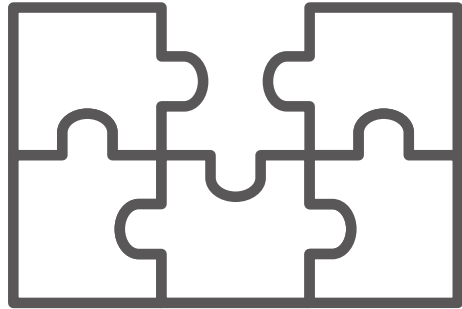
*Serial communication bridges are also possible.

Comparison of Network Standards

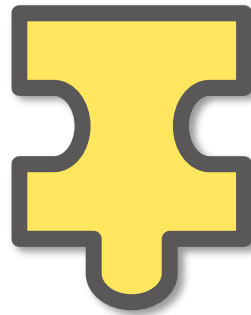


An Important Piece that Fills Customer Network Needs

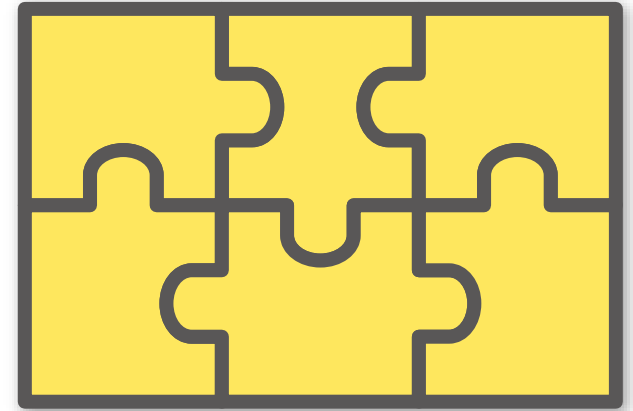
Cost? *Stability?* *Portability?*



**Ethernet/Wi-Fi/
Bluetooth/5G etc...**



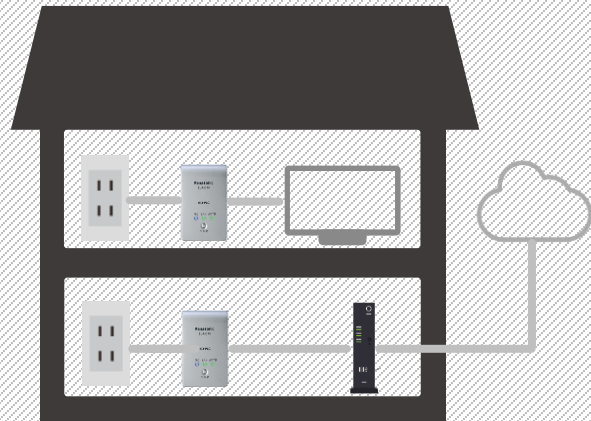
Nessum WIRE



The base technology is HD-PLC

2010

In-home
communication infrastructure



- Unable to connect
- No speed
- Rapid spread of WiFi

Withdrawal

Relocation

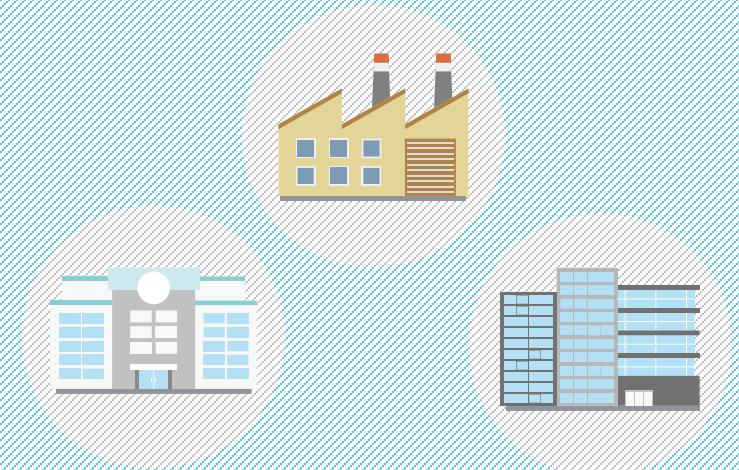


Evolution

Multihop
(Auto-relay function)

Now

B2B
communication infrastructure



- Low-cost NW
- Complement wireless
- Reduce cables

Over 5 million units

Reasons for Nessum WIRE adoption

1. Low-cost network construction



Camera



Doorbell



Street lights

2. Faster wired communication



PV



HVAC

3. Higher security



Plants

4. Wireless complements



Elevators



Underground



Concrete

5. Long distance



Smart Meters



Buildings



Factories

6. Reduce cables



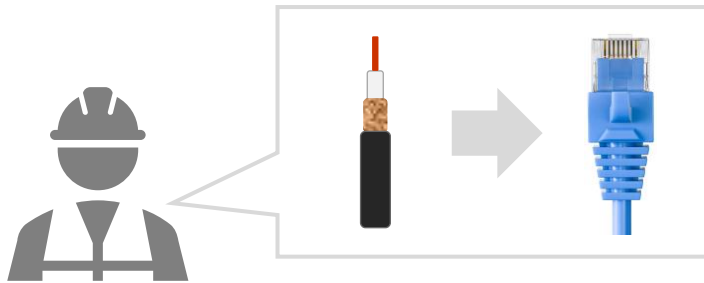
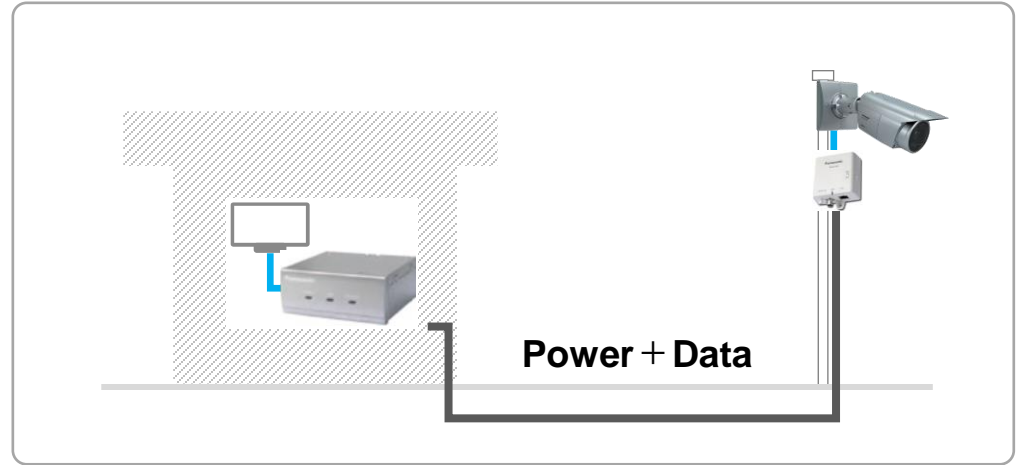
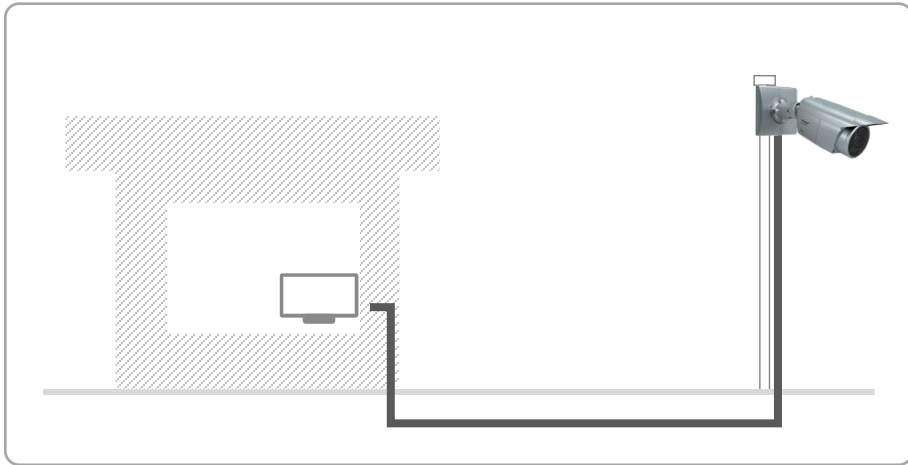
Robots

Example of low-cost network construction

Customer needs

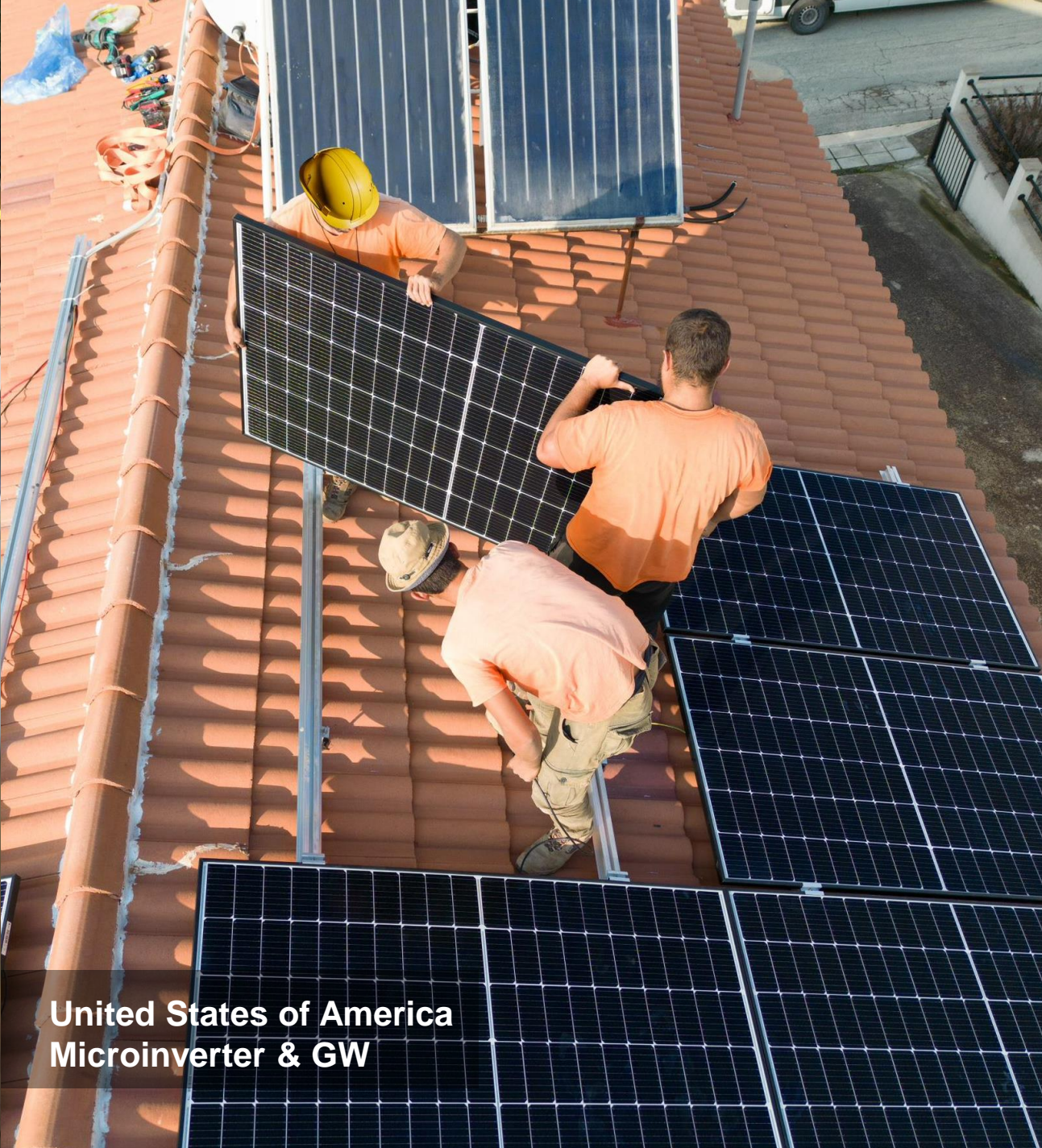
- Customers want to replace analog camera to IP camera
- The cost of replacing coaxial to Ethernet cable is high.

By using a coaxial Ethernet converter, existing coaxial wires can be used.



Reduce network construction costs!


2. Faster wired communication



United States of America
Microinverter & GW

Case study 2

Speed up to improve power Generation efficiency

 Replacing a narrow-band PLC (kbps) with
Nessum WIRE (Mbps)

3. Higher security

Case study 3

Secure space where wireless communication cannot be used



Since information is conveyed on physical lines, risks of information leakage and intrusion are reduced.

**Japan
Industrial plant**



Taiwan
Smart Meter



- 4. Wireless complements
- 5. Long distance

Case study 4

Energy management for Utility infrastructure



Smart meter in the condominium and Apartment. Applicable to LV/MV/HV Powerline infrastructure.

6. Reduce cables

Case study 5

Number of cables
38 → 9

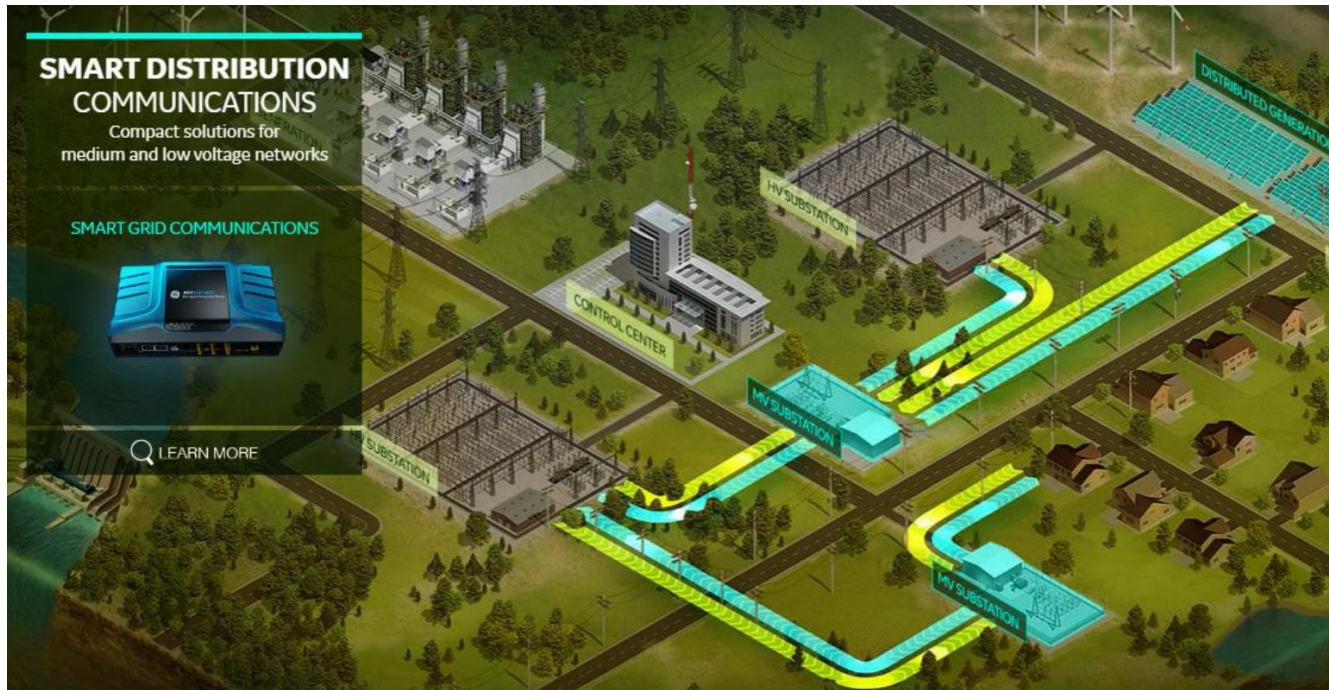


- Weigh saving
- Reduce failure rate
- Reduce assembly time

<https://www.daihen.co.jp/products/cleanrobot/pdf/wafer/wafer.pdf>

Japan
LSI manufacturing robot

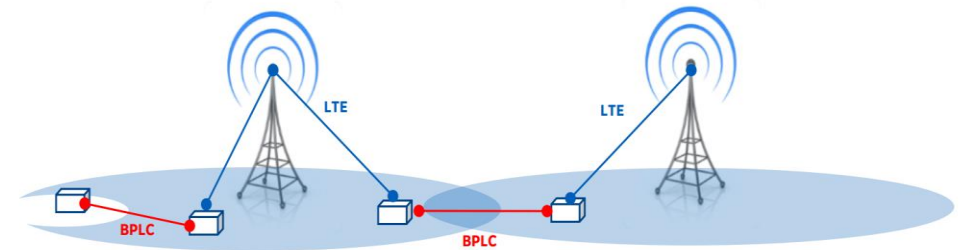
GE CIC* Begins Collaboration on Smart Grid Solution



Nessum to be selected for the lineup of communication equipment for smart grids

Why Nessum WIRE?

- ✓ Improved coverage with LTE complementation
- ✓ Improved network resilience

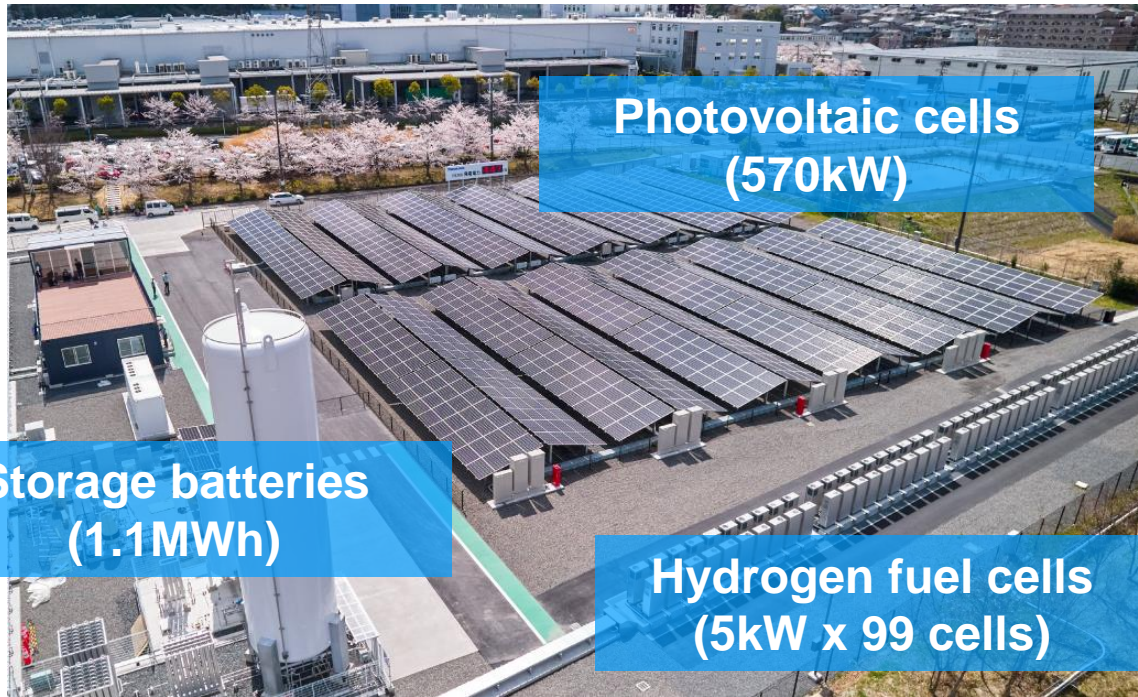


*CIC : Critical Infrastructure Communications

Source : February 1, 2023 IEEE&HD-PLC Joint Webinar Materials

Panasonic RE100 Solution

Adoption of Nessum for Hydrogen Fuel Cell Communication



2024: Hydrogen fuel cell with Nessum to be released

Why Nessum WIRE?

✓ Reduction of network construction costs

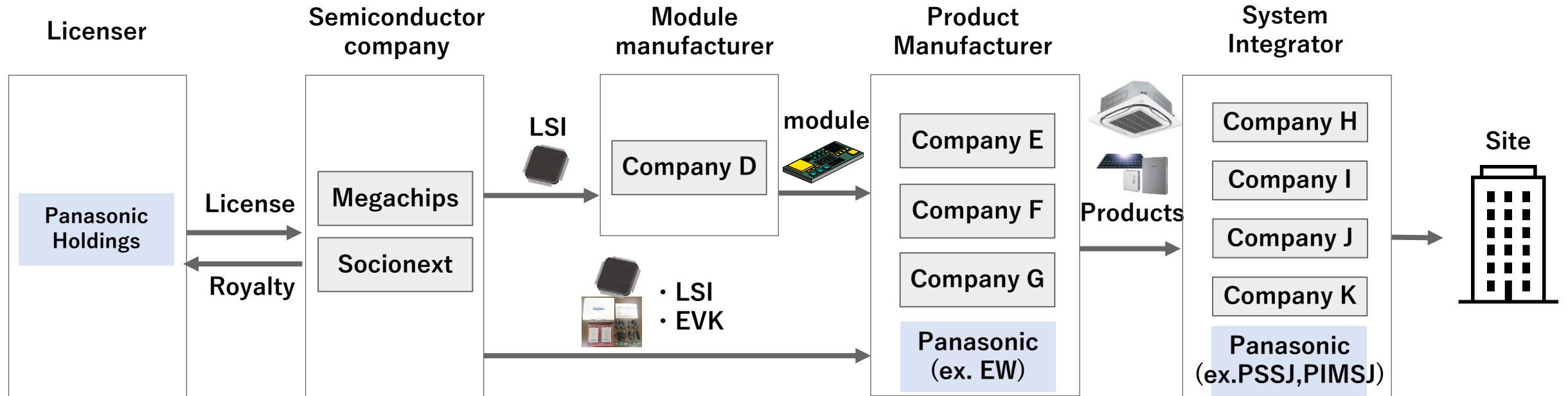
There is no need to install a hub every 100 meters like a LAN cable.

Daisy chaining is also possible, so wiring is reduced. Construction is possible in a short period of time.

✓ Reliable communication

Enables robust and secure communication

Nessum Eco-System



Nessum Alliance

- Establishment
2007 (Founder : Panasonic)

- Main activities

Interconnect Compatibility Authentication

- Compatibility Testing & Certification
- Certification Logo

Promotion

- Website/webinar
- PR/exhibition



Standardization

- IEEE 1901 / TTC JJ-300.20
- Deregulation in Japan



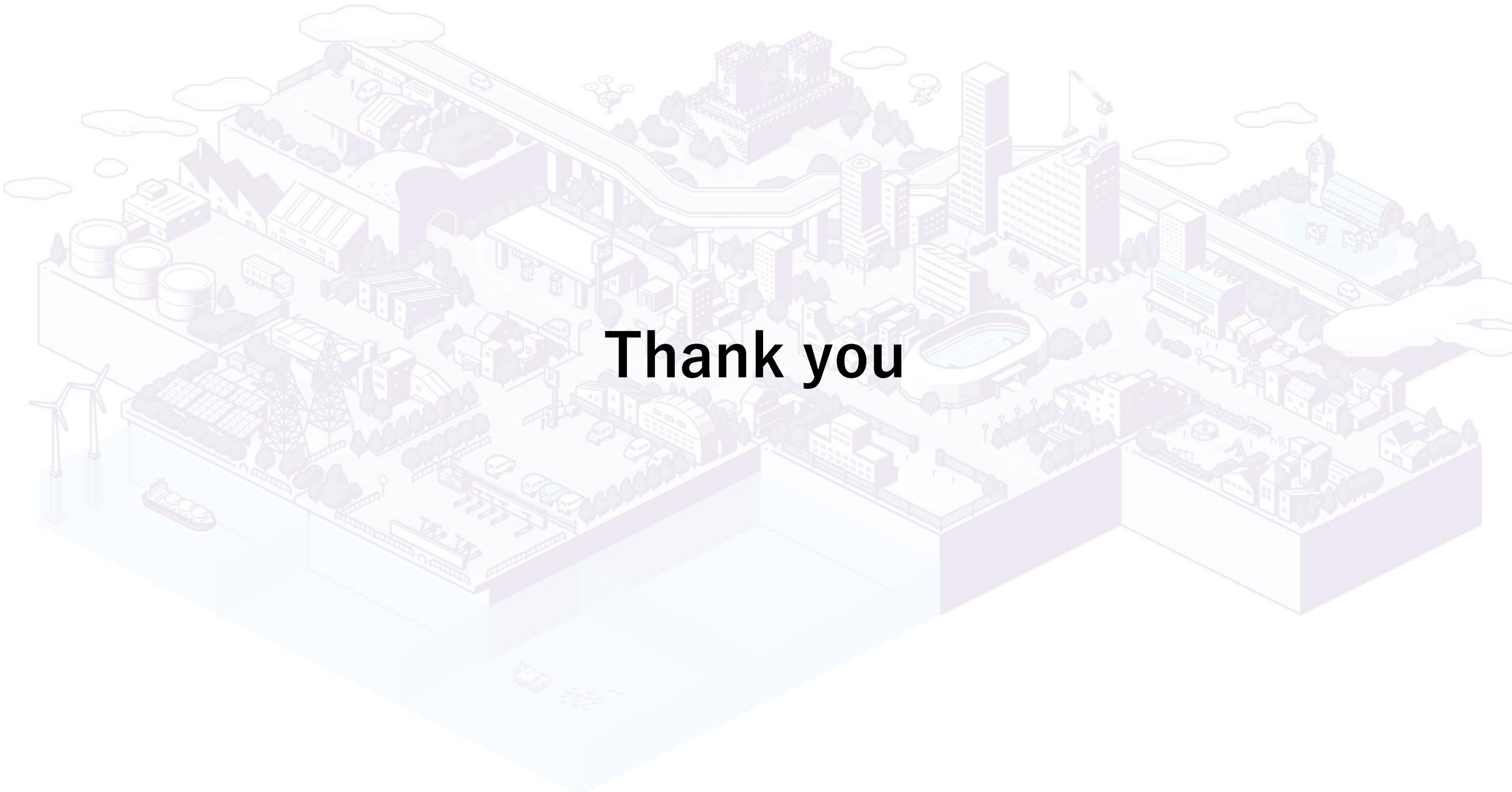
Nessum Test House

- Number of Memberships : 25
(As of December 2023)

- WEB : <https://nessum.org>

- SNS :    





Thank you