

F-01

Evolution of Area Formation Technologies toward 6G Era

Social Issues that we have focused on

Radio waves in the high-frequency band are difficult to handle due to their characteristics such as strong straightness and large attenuation, making it difficult to properly transmit radio waves in the high-frequency band to customers.

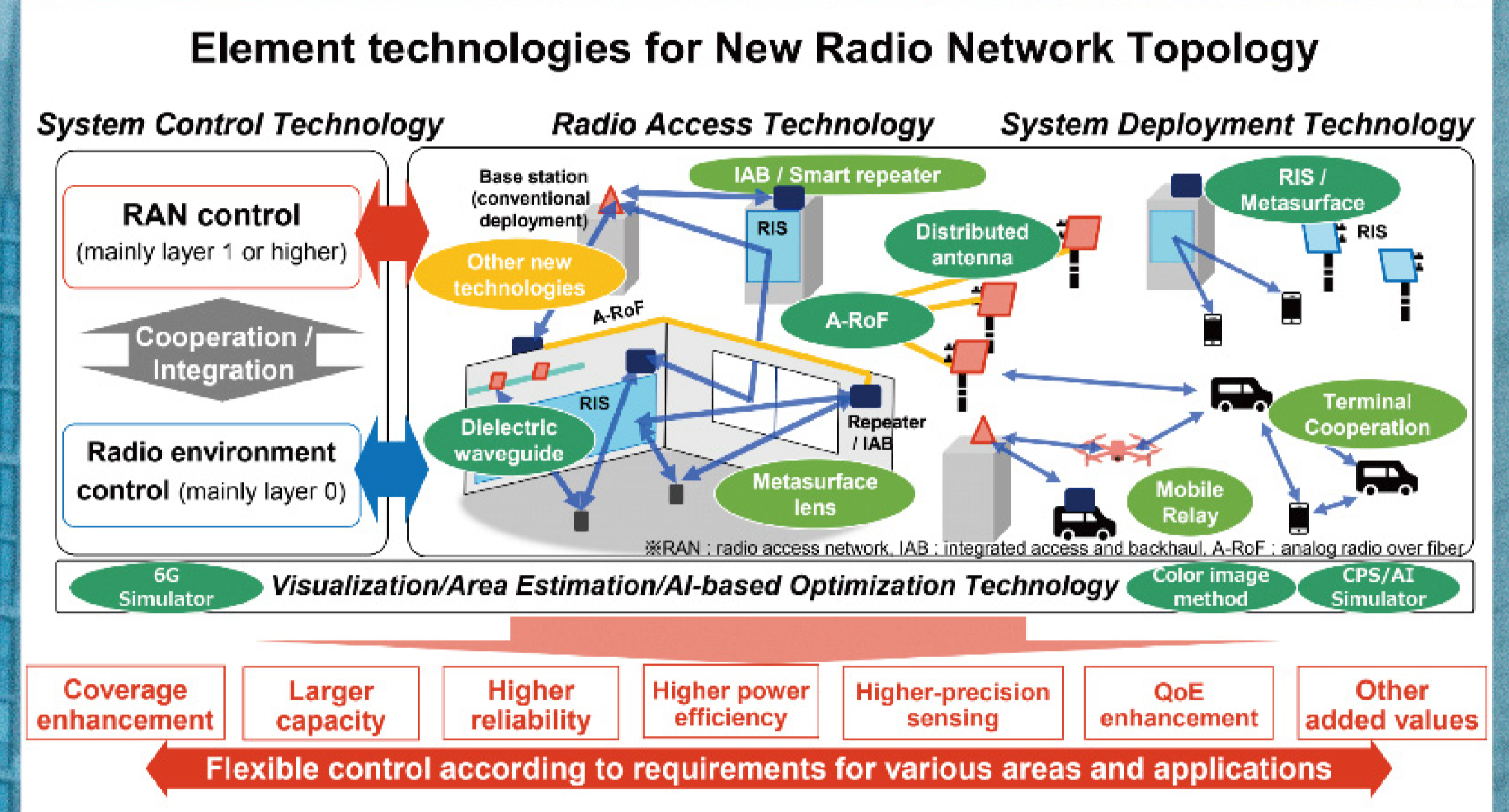
Initiatives to resolve issues

Overview

In order to overcome the radio propagation characteristics of the high-frequency band (strong straightness and large attenuation), we will visualize radio propagation in a timely manner to accurately grasp how radio waves travel, examine study elemental technologies for area formation and verify their improvement effects using simulators to further advance the technologies.

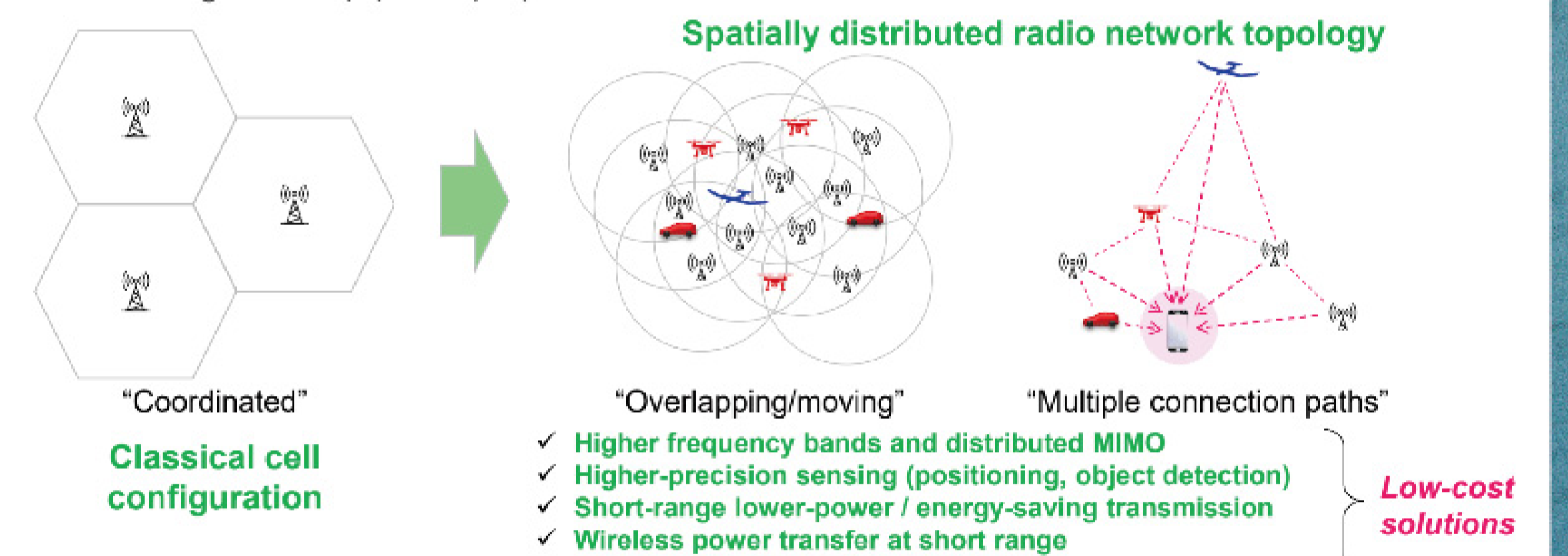
Technology to Support Initiatives

The Color Images Method can identify accurately the way radio waves travel. We will also make improvements with area formation technologies such as dielectric wave pathwaveguide, which freely constructs the communication area, and distributed MIMO, which makes distributes a large number of antennas slaved to a single base station in one area and MIMO transmission is established between each antenna and mobile terminal in the area. Furthermore, we will visualize the effects of these technologies using the 6G Simulator and other tools.



Concept of New Radio Network Topology

- Extremely higher data rate, capacity (especially in uplink) and increased reliability of radio access network for 5G Evolution & 6G
 - Short distance and line-of-sight (LOS) communications (decreasing path loss)
 - Providing flexible path selection by increasing path numbers between multiple base station (BS) antennas and the target user equipment (UE)



Co-creation
Partners

NEC Corporation

SDGs



By increasing the number of connection paths in a wireless network, higher redundancy, extended coverage area, avoidance of blocking, and MIMO spatial multiplexing can be expected, which will enhance coverage and capacity, and power efficiency also can be improved by optimum path selection and controlling according to the requirements of each area and application.

Appropriate area quality enhancements can be achieved in a timely manner.