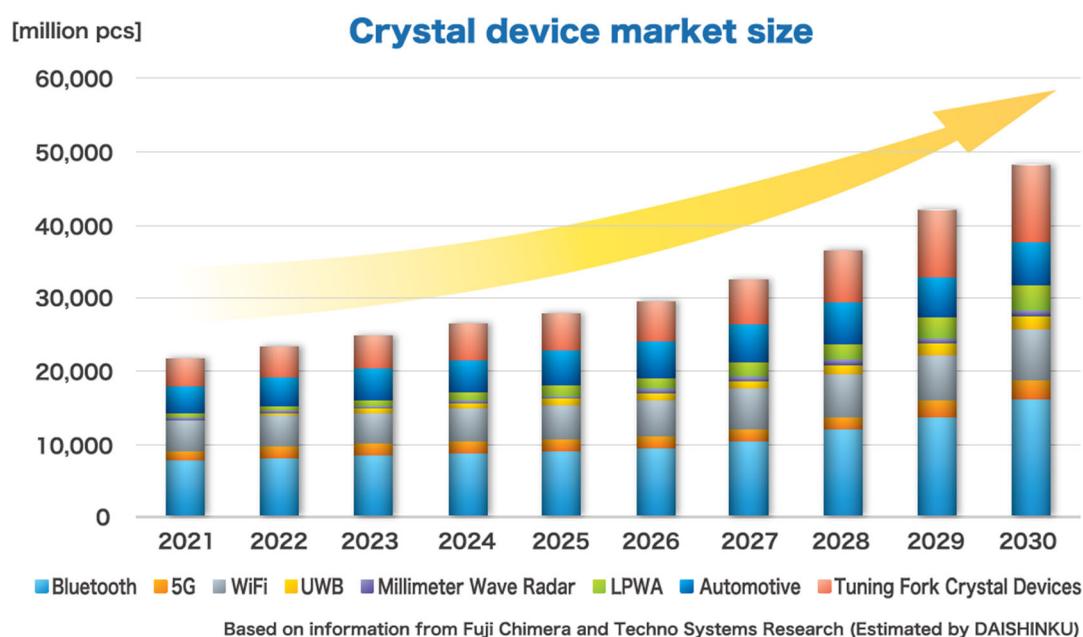


[Story 2] Reducing the number of days required to grow synthetic quartz crystals

Expansion of the timing device market and synthetic quartz crystals

There is no doubt that the timing device market will expand, mainly in the automotive market, which is moving toward autonomous driving, and the IoT market, where wireless communication is indispensable. By 2030, the size of the market is expected to grow at least 2.2 times compared to the 2021 level. To cope with such high market demand, the timing device industry must make huge investments in equipment. Shortages of parts and materials, including synthetic quartz crystals, may make it difficult to ensure a stable supply.



One of our most important missions is to stably offer timing devices, which are essential for a connected society in the future, in the required quantity when necessary.

Issue related to securing synthetic quartz crystals

As discussed in Story 1, in photolithography, the larger the wafer size, the larger the number of crystal blanks per wafer, leading to higher productivity. Thus, increasing the size of quartz crystal wafers (namely, rough crystals) is a crucial factor in improving corporate competitiveness. In other words, securing a stable supply of large synthetic quartz crystals is the key to solving the important issues above. It should be noted that the growth speed of quartz crystals varies depending on the direction (axis). Even in the direction with the fastest growth, the growth speed is less than 1 mm per day. It takes many days to grow large synthetic quartz crystals. The longer it takes to grow crystals, the higher the cost of electricity, resulting in higher environmental impact and manufacturing costs.

Taking on challenges to solve the issue

To ensure a stable supply of synthetic quartz crystals, implement environmental measures for reducing CO₂ emissions, and cut costs, Daishinku has promoted efforts to improve the energy efficiency of the growing furnace. By reinforcing and repairing the thermal insulation materials, we succeeded in reducing power consumption by about 20% compared to the previous level. We have also made efforts to reduce the number of days required to grow synthetic quartz crystals. We have succeeded in reducing the number of days from 150 to 100, thereby cutting the power consumption by more than 30%. Through these efforts, electricity consumption, which accounts for 70% of the cost of growing synthetic quartz crystals, has been halved, and production capacity has been increased 1.5 times.

**Electricity charges account for about 70%
of the cost of growing synthetic quartz crystals**



Saving energy by about 20%
by improving the crystal-growth furnace
(reinforcing heat insulating material, etc.)



Moreover

Saving energy by about 30%
by reducing the growing period
from 150 days to 100 days



**Total energy
consumption
reduced by about 50%**
**Production capacity
(growth furnace): 1.5 times**