September 2017: establish a production plant for CM-CNFS for additive applications such as foods and cosmetics at the Gotsu Mill from September 2017. Parts of this capacity is used internally as a deodorizer and odour reducer (antimicrobial) in adult diapers.

February 2018: announce plan to build a demonstration plant at Fuji mill in Japan to drive the development of practical applications of "MinerPa®"; a set of new functional materials created by compounding particulate minerals and wood pulp (cellulose fibers) using the Company's pulp-modification technologies.

October 2018: complete "MinerPa®" demonstration plant with an annual production capacity of more than 450 tons.

Production process

TEMPO oxidized CNF process
The TEMPO oxidized CNF process was developed by the research group of Prof. Akira Isogai of the University of Tokyo. Carboxymethylated CNF can also be produced. With this method, pulp is easily defibrated and nanofiber with a uniform width can be created.

Wood pulp→TEMPO oxidation, Carboxymethylation, Mechanical treatment.

- Raw materials
  - Wood pulp.

- Conversion
  - TEMPO oxidation, Carboxymethylation, Mechanical treatment.
  - High concentrations of metal ions and metallic nanoparticles with anti-bacterial and deodorizing effect are attached to the surface of the CNF sheet.

- Testing & prototyping
  - Demonstration samples in large quantities sent to materials suppliers, converters and end users.
  - Possess in house application and production know how.

- Partnerships
  - University of Tokyo.

- Applications
  - Direct sales to materials suppliers, converters and OEMS.
  - Direct sales to market.

Figure 74. Nippon Paper CNF production process.

Products
The company produces TEMPO-catalyzed CNF, as well as carboxymethylated CNF and CNF composites.