

# What is **CNF** Cellulose nanofiber?

## Plant Biomass



- Wood, branches and leaves, fruits
- Food residue
- Unutilized biomass (Rice straw, weeds)
- Used paper

## Pulp



© 北越紀州製紙

## Cellulose Nanofiber



© 京大

- Plant-derived material
- Nanosized fibrils made by defibrating cellulose taken from plant by chemical / mechanical treatment
- Strong and lightweight  
(five times the strength of steel at one-fifth the weight)
- Large specific surface area (>250m<sup>2</sup>/g)
- Low coefficient of thermal expansion (One-fiftieth of glass)

Consortium Members of the NCV Project

|                                                                                                                                  |                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|  京都大学<br>KYOTO UNIVERSITY                        |  京都産業技術研究所                                 |
|  UBE<br>宇部興産株式会社                               |  株式会社 昭和丸筒                                |
|  昭和プロダクツ 株式会社                                  |  国立大学法人<br>名古屋工業大学                        |
|  RISHO                                         |  Akita Prefectural University<br>秋田県立大学   |
|  INOAC                                         |  KYORAKU                                  |
|  DN<br>ダイキョーニシカワ株式会社                           |  三和化工株式会社<br>SANWA KAKO CO., LTD.         |
|  maxell                                        |  AISIN                                    |
|  DENSO<br>Crafting the Core                    |  トヨタ紡織株式会社<br>TOYODA SEISAKU GOSHI KAISHA |
|  TMJ<br>トヨタ自動車東日本<br>TOYOTA MOTOR EAST JAPAN |  KIT<br>金沢工業大学                          |
|  TOYOTA<br>CUSTOMIZING &<br>DEVELOPMENT      |  東京大学<br>THE UNIVERSITY OF TOKYO        |
|  産総研<br>技術社会へ Integration for Innovation     |  一般社団法人<br>サステナブル経営推進機構<br>SuMPO        |

- Published  
Ministry of the Environment, Government of Japan  
Climate Change Projects Office, Climate Change Policy Division,  
Global Environment Bureau
- Representative Body  
Kyoto University Research Institute for Sustainable Humanosphere  
<http://www.rish.kyoto-u.ac.jp/ncv/>



Ministry of the Environment

# NCV Nano Cellulose Vehicle PROJECT

Nature-gifted Automotive

Nano Cellulose Vehicle

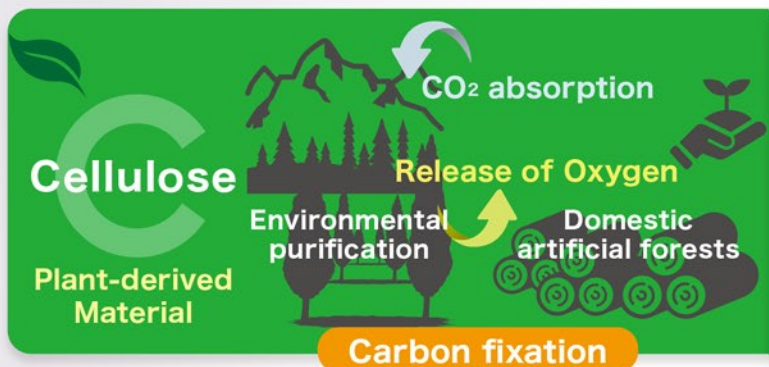


NCV Concept Car  
Caption Board





**Nature-gifted Automotive Nano Cellulose Vehicle**

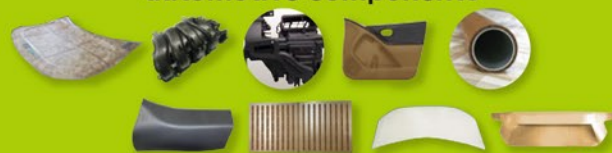


**Cellulose Nano Fiber**

- 50% of wood components
- 5 times the strength of steel
- 1/50 thermal expansion coefficient of glass

Promoting dissemination of CNF-based products in automotive field

Development and evaluation of CNF-based automotive components



Utilization of domestic and regional resources

Weight reduction of automotive

Carbon neutral

Promotion of multi-material

Reduction of greenhouse gas emissions

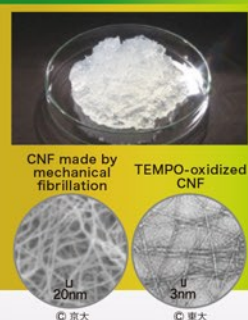
High robustness

**Vehicle**



Production of concept car

- SDGs
- Society 5.0
- Paris agreement
- Regional Circular and Ecological Sphere
- CE100 RE100



**What is NCV project ?**

Cellulose nanofiber (CNF) is a material composed of nanosized cellulose fibrils. This plant-derived material, which offers high strength and high modulus at one-fifth the weight of steel is expected to be used in products in various fields as the next generation material.

The Ministry of the Environment of Japan launched the NCV (Nano Cellulose Vehicle) project by forming a consortium led by Kyoto University in FY2016. This project is designed to develop CNF composite resin and automotive components and the performance of these CNF-based products is also evaluated at each stage.

NCV project aims the dissemination of CNF-based products in the automotive industry in order to reduce CO<sub>2</sub> emissions through promoting energy conservation and weight reduction of automotive.

