



# New value of trees to the world

Happiness Grows from Trees

 SUMITOMO FORESTRY

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筑波研究所  
TSUKUBA RESEARCH INSTITUTE

## CONCEPT

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### There is great potential for trees.

That potential ranges from global, urban and living environments, to the health of our minds and bodies. Trees are expected to be an important solution to the challenges faced by those of us living today.

### We research trees.

You could say that we are looking for seeds of hope for the future.

Tsukuba Research Institute, Sumitomo Forestry uses experience and data from over 100 years of tree-related business development by Sumitomo Forestry.

Furthermore, as one of the world's few comprehensive research institutes for trees, our institute can be a place to connect knowledge between Japan and overseas.

We aim to make the future of the world more wonderful by drawing out and maximizing the value of trees.

## VISION

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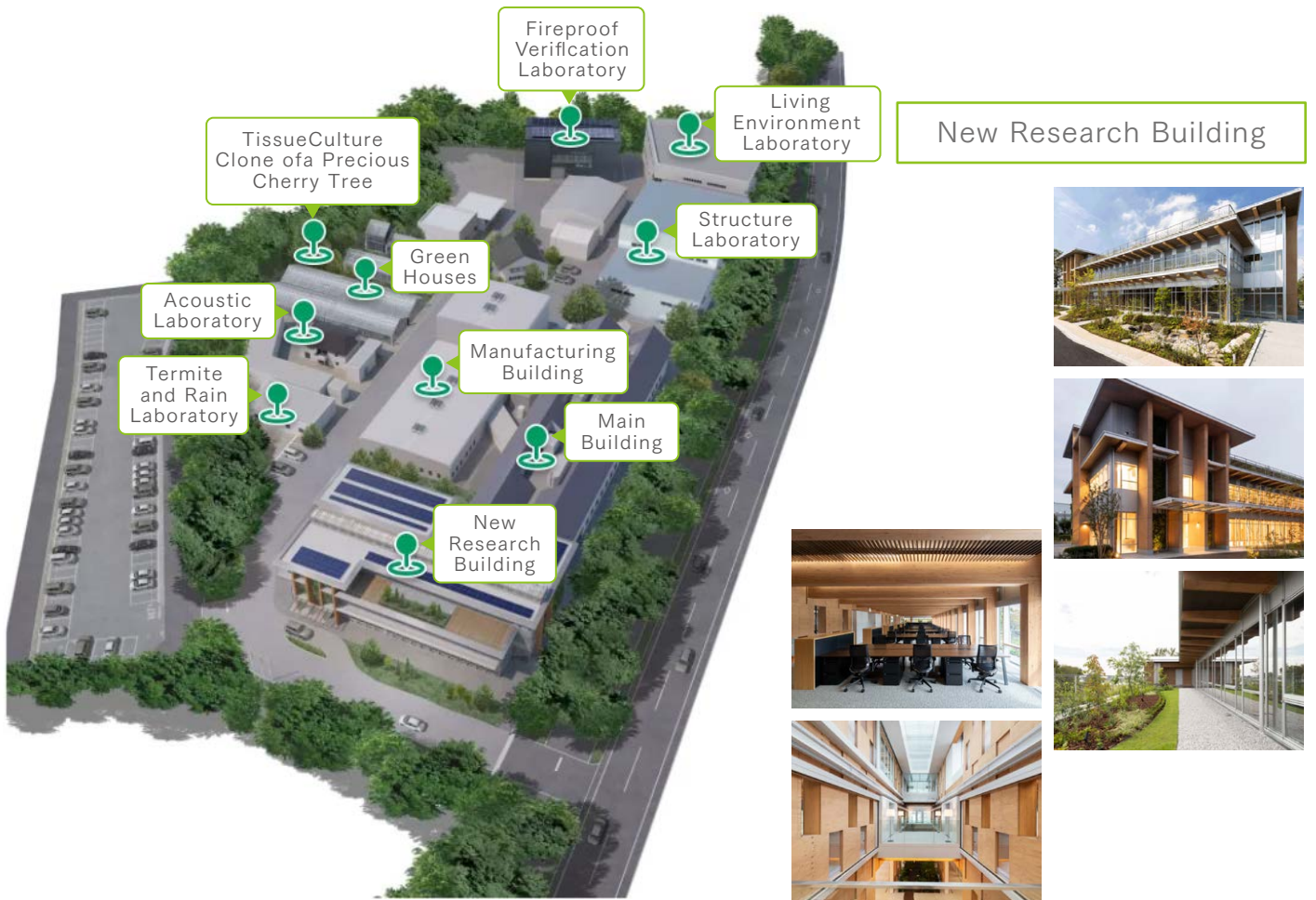


Tsukuba Research Institute, Corporate Division, is engaged in R&D to maximize the value of forests and trees by turning the “WOOD CYCLE,” a value chain centered on trees, in order to realize our long-term vision toward decarbonization for 2030, “Mission TREEING 2030” ~Making our planet safer and more secure for future generations~. We accelerate our R&D activities based on business policies and strategies in the forestry, timber, and construction business domains, and promote R&D as a leader in creating new business opportunities and value.

**Supervisory Officer /  
General Manager of Tsukuba Research Institute**

**Masakazu Takahashi**

# ABOUT US



# RESEARCH & DEVELOPMENT

## PLANNING GROUP ADMINISTRATION GROUP

R&D infrastructure management.  
Support to stimulate and facilitate  
R&D activities.



## RESOURCES GROUP

R&D of biotechnology for breeding,  
propagation and afforestation.  
Visualization of the value of forests.



## MATERIALS GROUP

Enhancing the strength and  
durability of wooden materials.  
Improving the performance  
of wood-based boards.



## HOUSING & ARCHITECTURE 1 GROUP

Research and development of  
a wide range of timber engineering.  
(mainly structure, fire resistance, and acoustics)



## HOUSING & ARCHITECTURE 2 GROUP

Living environment with the power of nature.  
Evaluation of effects of wood and  
greenery for comfort and health.



## HOUSING & ARCHITECTURE 3 GROUP

Rationalizing construction.  
(improving components, methods and operations)  
Various quality inspection for  
higher-quality wooden buildings.



# RESOURCES GROUP

## Changing the world with new value in forest resources

We research and develop the conservation and propagation techniques for useful trees through biotechnology and the breeding, propagation, and afforestation technologies for the afforestation projects.

We aim to realize a decarbonized society with our research on biorefineries and the visualization of the value of forests.

### Developing technologies for "forestry," the engine of the Wood Cycle



In order to promote afforestation in Japan and overseas, we develop technologies to select and mass-produce excellent varieties of trees with environmental resistance, growth potential, and timber quality. We will maximize the value of trees and contribute to create the next-generation forests with cutting-edge breeding and propagation technologies such as genomic selection and cell propagation.

### Tissue culture techniques for the conservation of valuable trees and the propagation of useful trees



Through our tissue culture techniques, we are contributing to the preservation and regeneration of famous and precious trees throughout Japan and the spread of useful trees such as the pollen-free cedar.

### Biorefinery



We research and develop technologies to separate wood constituents and use each constituent effectively. We will promote the industrial production of chemicals using wood biomass and the substitution of petroleum-derived products with wood biomass-based products.

### R&D on carbon storage and "Nature" in forests



Forests, which place the basis of our business activities, have a public benefit function. We will clarify the impact of forest management on carbon accumulation and "Nature" (stability of water resources, conservation of biodiversity and so on) and lead to the improvement of the public benefit function of our operation sites.

# MATERIALS GROUP

## Enhancing the value of wood and developing newsustainable materials.

We conduct various R&D activities, such as increasing the strength and durability of wood (antiseptic, anti-termite, weatherproof, etc.), improving the performance of wood-based boards, and combining wood and plastic.

### R&D on technologies to increase the strength and durability of wood



We develop manufacturing technologies for the next-generation high-strength engineered wood and other related Innovations.

### Improving the performance of wood-based boards



We improve the performance of particle board and MDF produced at our group's overseas manufacturing bases.

### Development of anti-termite technology



We develop anti-termite specifications for timber buildings in countries overseas where termite activity is more prevalent.

### Developing the processing technology for biodegradable biomass plastics with new functions



We develop the processing technology for unprecedented biomass plastics with high strength and elasticity in addition to biodegradability.

# HOUSING & ARCHITECTURE 1 GROUP

## Evolving timber buildings for an amazing future

We are engaged in research and development of a wide range of timber engineering (mainly structure, fire resistance, and acoustics) for timber buildings including detached houses and mid- to large-scale buildings.



### "Big Frame" for strong wooden houses

We have developed the "Big Frame," that enables a rahmen structure in a wooden house, to realize high flexibility of planning for houses with the robust structure. We continue the evolution of timber buildings further.



### "Post-tension seismic technology" that supports mid- to large-scale timber buildings

"Post-tension seismic technology" is used to increase the rigidity and resilience of timber structures with loading tension between wall columns, beams and other components with steel rods. We contribute to support implementation of the technology in actual projects with repeating verification by structural tests.



### Challenges to fire resistance required for mid- to large-scale buildings

We developed the "Ki-Gurumi CT", a 3 hour fire-resistance structural member, using wood as a fire-resistance cladding. Using large scale furnaces, we conduct fire resistance tests on columns, beams, wall members, etc., assuming an actual building.



### Full-scale experiments to confirm strength and seismic performance

We conduct a wide range of experiments, from joints with a single nail to real-size structures. Through static load tests and vibration tests, we obtain data that cannot be obtained through the simulations to verify strength and earthquake resistance.



### Improving livability from the viewpoint of acoustics and vibration

We evaluate the sound insulation and room acoustics in the full-scale verification fields and the walking vibration evaluations of long-span floors in full-scale test specimens. Our developments contribute to the improvement of livability.

# HOUSING&ARCHITECTURE 2GROUP

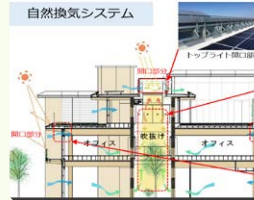
Adding a new value to the living space  
with the power of wood

We examine the impact of the living environment using the functions and characteristics of wood and greenery, as well as the power of nature and efficient use of equipment, on human comfort and health, and contribute to a decarbonized society through the creation of comfortable spaces.



## Verifying the effects of light, wind and heat on humans

We verify the effects of the living environment on humans from a psychological and physiological perspective in an actual space and an artificial climate chamber that can reproduce light, wind, temperature, humidity, etc. under various conditions. We will utilize it to realize a comfortable living environment.



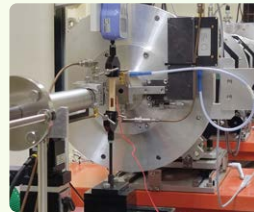
## Searching for the lifestyle friendly to both people and the earth

Toward a decarbonized society, we propose the methods of improvement of building performance, devises of planning, energy saving equipments and their efficient operation, and verify the effects of them. They will be reflected in proposal of living space, equipments planning and our passive design "Ryoonbo."



## Visualizing the value of wood construction and wood exposed space

We communicate the value of wood construction and wood exposed space by proving, based on objective data, that "biophilic design" spaces, which incorporate natural elements such as wood and greenery, are effective in improving human well-being and productivity.



## Exploring the new value of wood

Aiming to expand the use of wood, we explore the new value of wood through analysis at the elemental level, research using synchrotron radiation and so on.

# HOUSING&ARCHITECTURE 3GROUP

Technological innovation for high quality and high durability

We research and develop a wide range of areas, from developing components to improving construction methods for housing, rationalizing production, and saving a labor.

In addition, we inspect the quality of our distributing and constructing materials and support the provision of reliable materials and the improvement of the quality of buildings based on the data.



## Confirming the quality of housing materials and developing high-durability materials

Exposure verification buildings have been constructed in Ibaraki, Niigata, and Nagasaki to verify the durability of exterior materials in a real situation. We aim to develop the longlife housing through further improvements and development using the verification data.



## Developing High-quality, labor-saving construction methods

We focus on technological developments such as mechanizing exterior construction and improving antifouling and waterproofing performance of exterior walls, and also develop alternative materials and improve construction methods to reduce GHG emissions in overseas housing.



## Rationalizing on-site work

We develop construction techniques to achieve both high quality and safety with reducing labor hours and construction time through the modularization of building components, the development of temporary materials and construction equipments, and construction DX.




## Developing new materials to ensure a stable supply of materials

Not only checking the quality of materials from new suppliers, we also develop glued laminated timber made of new tree species. By adding the options for suppliers, we support a stable supply of materials.

# ACCESS



 TechnoPark Toyosato, 3-2,  
Midorigahara, Tsukuba City,  
Ibaraki, 300-2646, Japan

## Access information

### Using the Tsukuba Express Line:

Using the Tsukuba Express:

- 45 minutes from Akihabara terminal to Tsukuba terminal on the rapid train, then 25 minutes by taxi
- 49 minutes from Akihabara terminal to Kenkyū-gakuen station on the semi-rapid train, then 22 minutes by bus from the north exit of the station to Techno Park Toyosato Chuo, then 8 minutes on foot

### By car:

- About 30 minutes from the Joban Expressway Yatabe IC