住友林業

The Japanese Export Market for Durable Eucalypts: Technical Specifications

Durable Eucalypts on Drylands: Workshop/Research Update
19th June, 2018
UNIVERSITY OF CANTERBURY

Sumitomo Forestry Co. Ltd., JAPAN,
Tsukuba Research Institute
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住友林業株式会社

Today’s contents

1. Outline of Sumitomo Forestry
2. Market: Japanese technical specifications
3. Research: Durability of NZ grown Eucalyptus in Japan
4. Topics: Large scale timber building in Japan

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1. Outline of Sumitomo Forestry

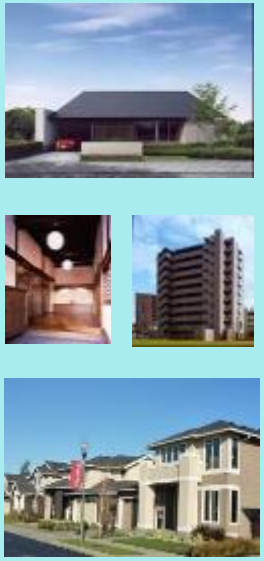
Company name : Sumitomo Forestry Co., Ltd.
Foundation : 1948
Start-up : 1691 (as predecessor of Sumitomo)
Employee : 17,802
Sales : 11.1 billion USD
Business : Forest management, International trading, Homebuilding, Real-estate, Large-scale timber building, Building material manufacture

Forest management

Trading

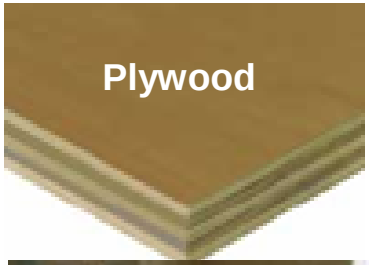
Manufacturing

Housing



Trading (Domestic and International)

Unparalleled procurement capability with more than 20-country worldwide network



Timber procurement philosophy and policy for promoting forest preservation across the entire distribution process.

Housing (domestic)









Sumitomo forestry provides 7,600 houses per year: the top brand in traditional Japanese custom-built detached wooden houses

Housing (Overseas)

Henly (USA)

Bloomfield homes (USA)

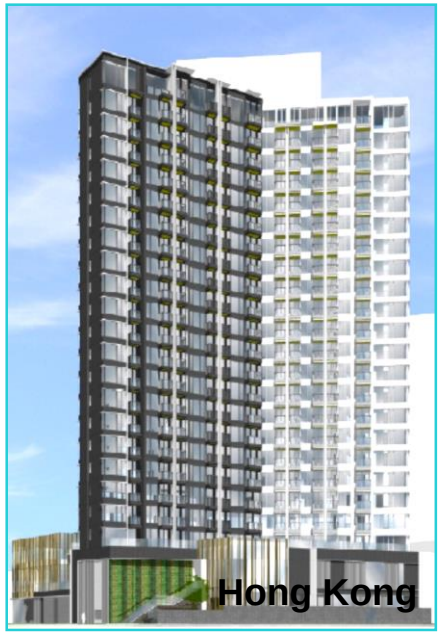
Henly homes (AUS)

Gehan homes (USA)

Dan Ryans Builders (USA)

Providing approx. 9,200 spec houses per year in America and Australia

Real estate development (overseas)



Manufacturing (overseas)

Increasing production capacity as a manufacturing base of quality timber and building materials, also manufacturing operations augmenting production capacity to meet demand in developing countries.

Forest Management (Overseas)

Approx. 191,000 ha of forest area

(Papua New Guinea: 31,000ha

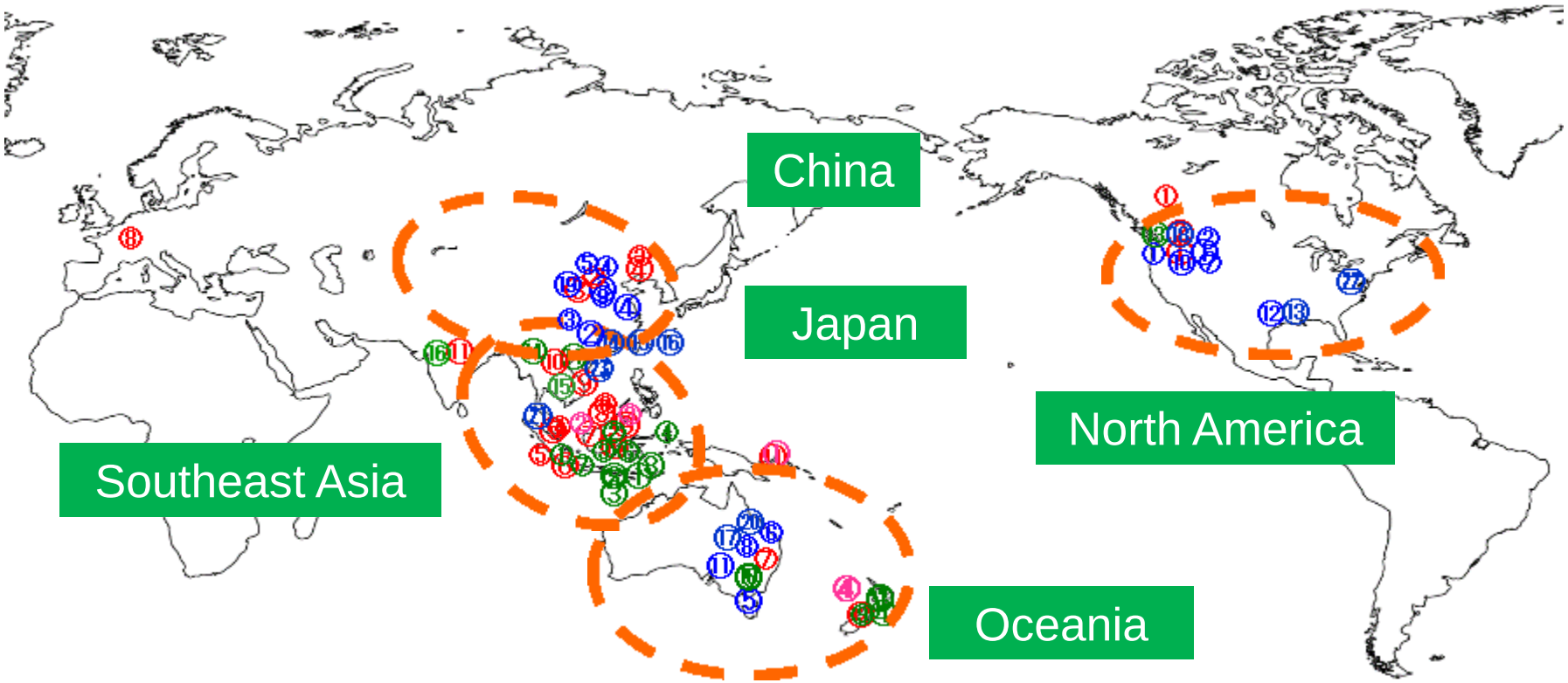
New Zealand: 35,000ha

Indonesia: 125,000ha)

enables us to supply sustainable forest resources throughout the world.

International Hubs

54 international hubs in 16 countries around Pacific rim



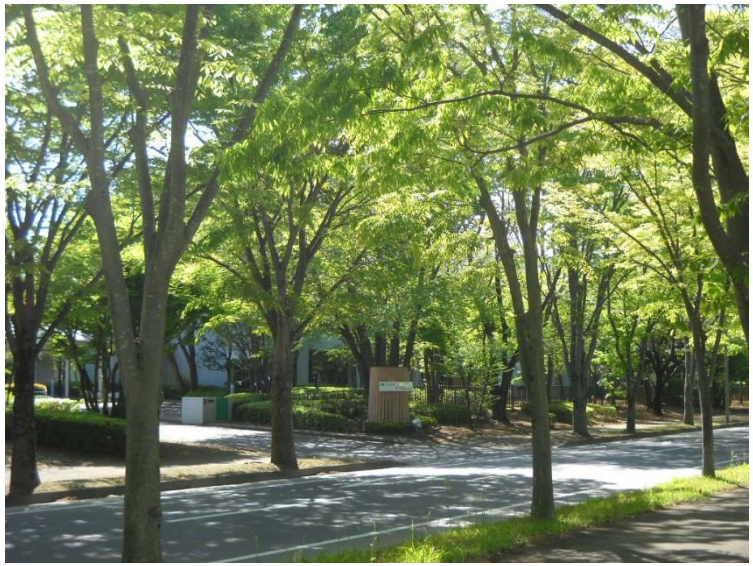
●流通拠点・事務所:①バンクーバー ②大連商貿 ③ハバロフスク ④SFシンガポール ⑤SFインドネシア
⑥コタキナバル ⑦SFオーストラリア ⑧アムステルダム ⑨ SFベトナム ⑩ SFタイ ⑪SFインド

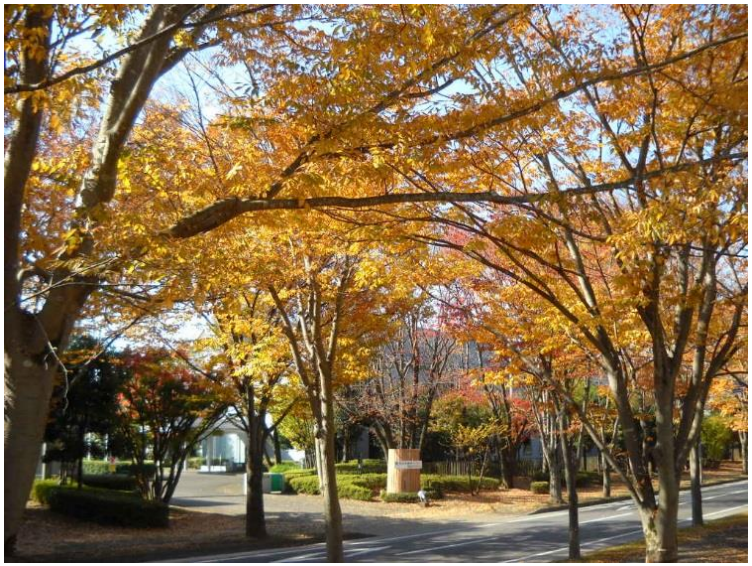
●植林事業:①OBT社 ②MTI社 ③WSL社 ④NZ植林新会社(2016年6月予定)

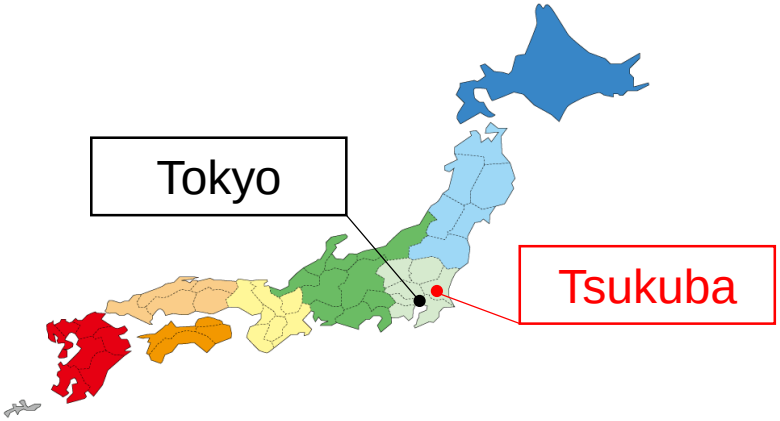
●製造事業:①KTI社 ②KTI社(プロポリンゴ) ③KTI社(スラバヤ) ④KTI社(サマリンダ) ⑤ASTI社 ⑥RPI社 ⑦RPI社(ジャカルタ) ⑧SRP社
⑨NPIL社 ⑩Alpine MDF社 ⑪Vina Eco Board ⑫SFNZ ⑬ Canyon Creek社 ⑭ Mos Lumber Products ⑮PAP社 ⑯SFPL社

●住宅事業:①SFC Homes社 ②CRC社 ③パラゴン上海 ④パラゴン大連 ⑤大連ITS ⑥ヘンリー社 ⑦ヘンリーUSA社 ⑧ 335 Grices Road社 ⑨煙台海外金橋
⑩SFアメリカ ⑪Edgewater Homes社 ⑫ Bloomfield Homes社 ⑬Gehan Homes社 ⑭スミリン香港 ⑮Partner Ally ⑯Rainbow Alpha
⑰SFA Land Developments ⑱Creekstone社 ⑲北京金隅装飾 ⑳ Annadale ㉑DNS AI社 ㉒DRB社 ㉓Phu Hung Thai新会社(2016年予定)

Tsukuba Research Institute





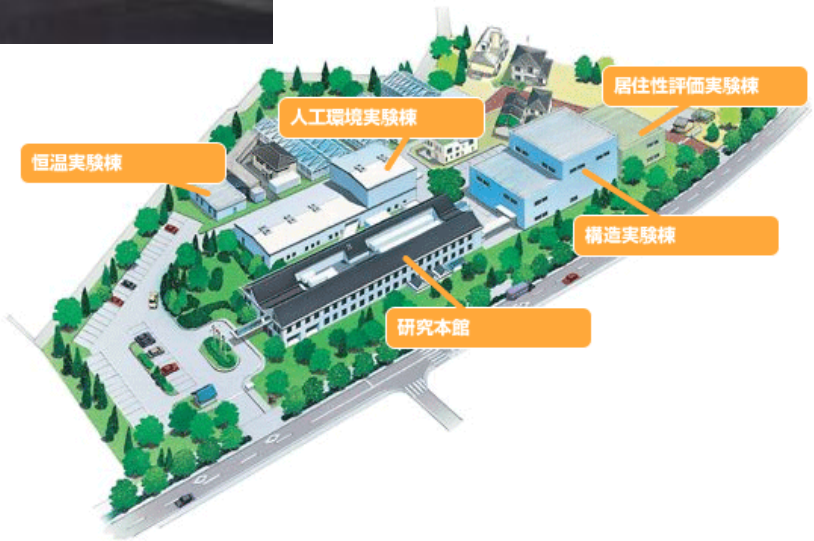


Located in Tsukuba “Science City” with beautiful four seasons

Tsukuba Research Institute

Architecture group

Material Group



Resources group

The team researches and develops new solutions to improve housing and to better society through the use of forest resources.

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2. The Japanese market: Technical specifications

There is no technical specification for naturally durable species in Japan.

AS 3660.1-2000 or AS 5604-2005 is quite unique.

Neither is there standard test method for naturally durable species in Japan, particularly ones used above the ground .

2. The Japanese market: Technical specifications

Major Japanese Standards

Official

1. Japanese Industrial Standard (JIS)
2. Japanese Agricultural Standard (JAS)

Non-official?

3. Japanese Wood Protection Agency Standard (JWPA)
4. Approved Quality (AQ) certification

2. The Japanese market: Technical specifications

Japanese Industrial Standard (JIS)

Justification

Ministry of Economy, Trade and Industry (METI)

Purpose

Promote the production, distribution and consumption of mining and industrial products, the unified product specifications

Examples

JIS K 1570 (2013) Wood Preservatives

JIS K 1571 (20) Qualitative Standards and Testing Methods of Wood Preservatives

Particleboard (JIS A 5908, 2015), MDF (JIS A5905, 2014), and so on

2. The Japanese market: Technical specifications

Japanese Agricultural Standard (JAS)

Justification

Ministry of Agriculture, Forestry and Fisheries of Japan (MAFF)

Purpose

Agricultural, forestry and fishery products, standards established unified nationwide

Examples

Preservative treated sawn lumber, and so on

Sawn timber, Gluelum, Plywood, LVL, and so on

2. The Japanese market: Technical specifications

Japan Wood Protection Association Standards (JWPA)

公益社団法人 日本木材保存協会
Japan Wood Protection Association

Justification

JWPA (Forestry Agency?)

Purpose

Providing test methods or performance standards for performance evaluation of preservatives and preserved wood that are not covered by JAS and JIS.

Examples

Preservatives, treated wood products, and so on

2. The Japanese market: Technical specifications

Examples of JWPA certified newly developed wood products

Acetylated resist rot wood

(https://www.accoya.com/)

Phenol treated resist rot wood

(http://www.kyumoku.co.jp/ecoaccord.html)

Resist rot structural MDF

(http://www.hokushinmdf.co.jp/structure/example.html)

Resist rot LSL

(http://www.oshika.co.jp/file/tji.pdf)

2. The Japanese market: Technical specifications

AQ Certification

公益財団法人
日本住宅・木材技術センター
HOWTEC

Justification

Japan Housing and Wood Technology Center (MAFF?)

Purpose

Certification that is not covered by JAS and JIS for newly developed wood products.

Examples

B: Preservative treated wood, wood products for outdoor utilization, C: Preservative treated gluelum, D: Preservative plywood, I : Resin treated wood products…

2. The Japanese market: Technical specifications

Examples of AQ certified newly developed wood products

Thermally treated resist rot wood

(http://www.koshii.co.jp/superthermo/)

Phenol treated resist rot wood

(http://www.kyumoku.co.jp/ecoaccord.html)

Treated resist shrink wood

(http://www.house-g.com/about/sunpo.html)

2. The Japanese market: Technical specifications

Durability of Heartwood (provided by Forestry and Forest Products Institute)

Justification

-

Purpose

Information

表 12.8　各樹種の心材の耐久性[48]

耐久性の区分	日本材 (Local)	北米，欧州，豪州材 (Rest of the world)	熱帯産材 (Tropical)
極大 (野外で年以上) Extremely durable			ウ，インツィア，ビチス，チーク，バンキライ，コムニャン
大 (野外で7～8.5年) Durable	ヒノキ，サワラ，ネズコ，アスナロ，ヒバ，コウヤマキ，クリ，ケヤキ，ヤマグワ，ニセアカシヤ，	ベイヒ，ベイヒバ，インセンスシーダー，ベイスギ，センペルセコイア，ブラックウォールナット，サイプレスパイン	レンガス，レザック，ナリグ，ケラット，ホワイトメランチ，セブターバヤ，パドーク，ピンカドー，セドレラ，チュテールバンコイ，マホガニー，ポンゴシ(アゾベ)
中 (野外で5～6.5年) Moderate	シラベ，カラマツ，クサマキ，イチイ，カヤ，トガサワラ，スギ，カツラ，スダジイ，クヌギ，ナラ，アラカシ，シラカシ，タブノキ	ダフリカカラマツ，ベイマツ(マウンテン)，ホワイトオーク，ペカン，バターナット	カナリウム，クルイン，カブール，ブジック，ライトレッドメランチ，イェローメランチ，マラス，メンガリス，ケンパス，アルトカルプス，バカウ，スロールクラハム，カロフィルム，テラリン，メルサワ，チュテールサール，ボルネオオーク
小 (野外で3～4.5年) Poor	モミ，アカマツ，クロマツ，イチョウ，マカンバ，コジイ，コナラ，アベマキ，イヌエンジュ，アカガシ，イチイガシ，ヤチダモ，キハダ，ヒメシャラ	ポンデローサマツ，スラシュマツ，ストローブマツ，テーダマツ，ベイツガ，ソフトメープル，イェローバーチ，ヒッコリー，オウシュウアカマツ，ベイマツ(コースト)	アローカリア，カポック，ドリアン，ターミナリア，エリマ，アピトン，アルモン，レッドラワン，タンギール，マンガシノロ，ニュージーランドビーチ，ビンタンゴール，ゲロンガン，ジョンコン，マングローブ，マトア，タウン，カサイ，ナトー，ケレダン，ユーカリ
極小 (野外で2.5年以下) Extremely poor	ハリモミ，アオモリトドマツ，トドマツ，エゾマツ，トガサワラ，イタヤカエデ，セン，ヤマハンノキ，ミズメ，シラカンバ，アカシデミズキ，ブナ，イスノキ，トチ[illegible]キ，シナノキ，シオ[illegible]，オオバヤナギ，イ[illegible]オバボダイジュ	ベイモミ，スプルース，ラジアータパイン，アスペン，コットンウッド，アメリカシナノキ，オウシュウトウヒ	アガチス，プライ，ジェルトン，カラス，パラゴムノキ，ラブラ，アンペロイ，セルチス，キャンブノスパーマ，アルストニア，ブランチョネラ，バスウッド，ロヨン，ホワイトシリス，ラミン，カナリウム，オベチェ，アルマンガ，ビスアン，カランバヤン，[illegible]

Cited from “Handbook of Wood Industry (2004)”

2. The Japanese market: Technical specifications

What are requested by these?

In brief, less than 3% weight reduction in termite and/or fungus tests is required.

2. The Japanese market: Technical specifications

AS/NZS is well updated and flexible.

JIS and JAS are not. They do not cover naturally durable species.

JWPA and AQ are some more flexible. They possibly could cover naturally durable species… but they have no precedent for such types

2. The Japanese market: Technical specifications

Discussions

Are these certifications always necessary?

Are the certifications of great help?

What do we need to do to come into the market with new species?

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3. Research: Durability of NZ grown Eucalyptus in Japan

Last time, I told you *E. Bosistoana* is highly likely to be …

Termite resistance and decay resistance (at that stage).

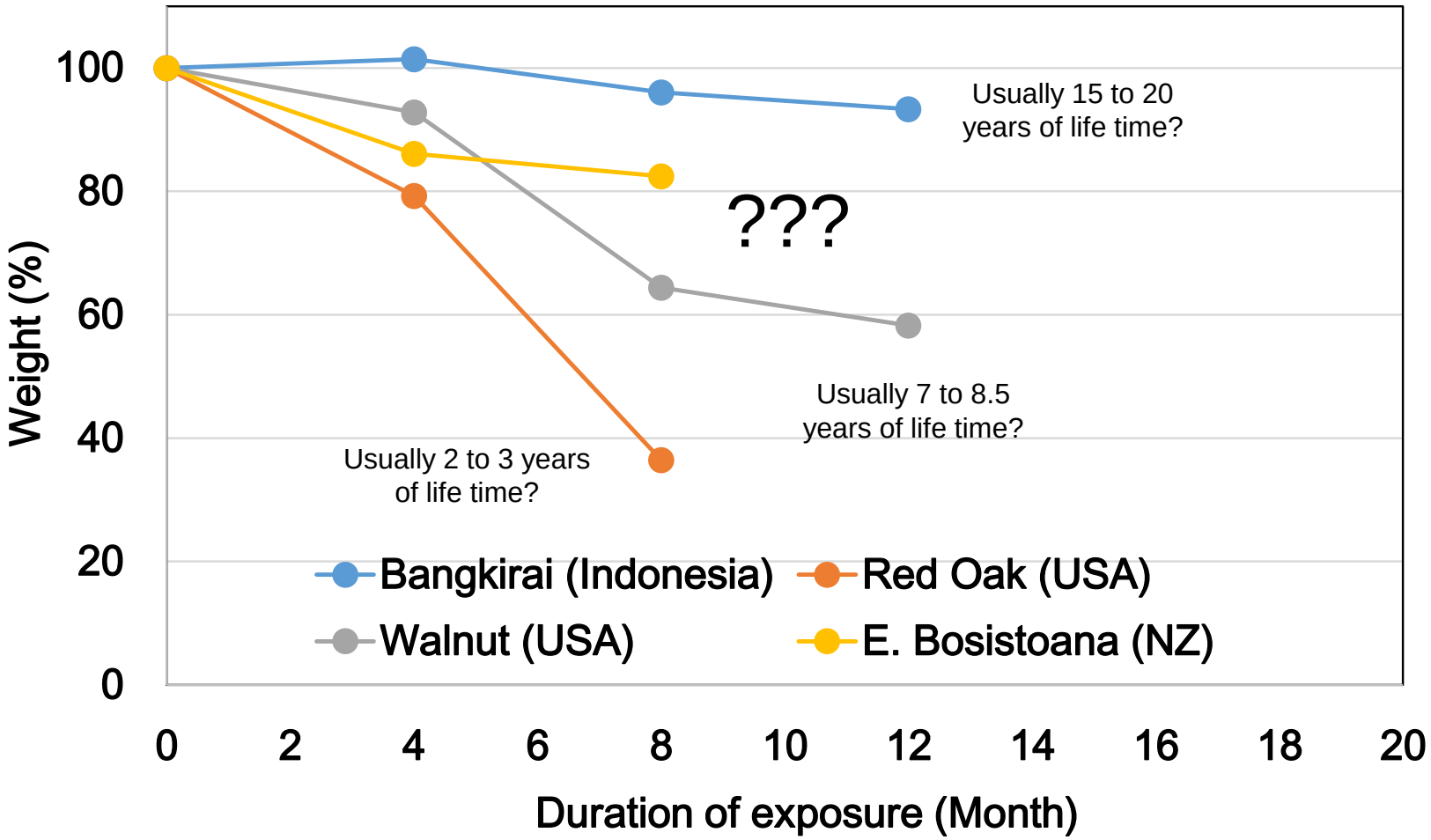
3. Research: Durability of NZ grown Eucalyptus in Japan

Fungus cellar test (modified Japanese Industrial Standard K 1571)

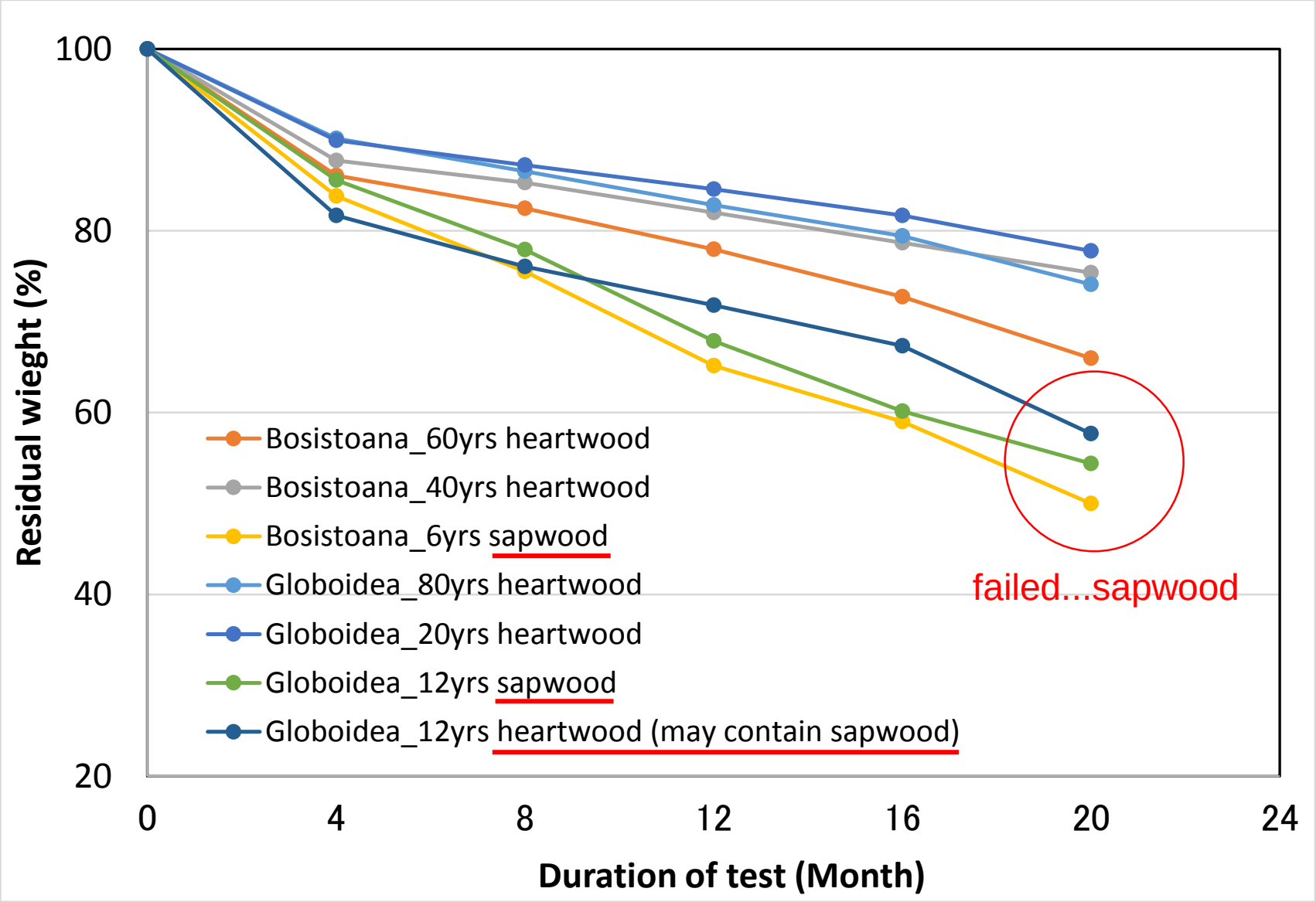
Specially prepared soil with plenty of moisture and nutrients under controlled temperature, which enhances wood rotting fungi activities

3. Research: Durability of NZ grown Eucalyptus in Japan

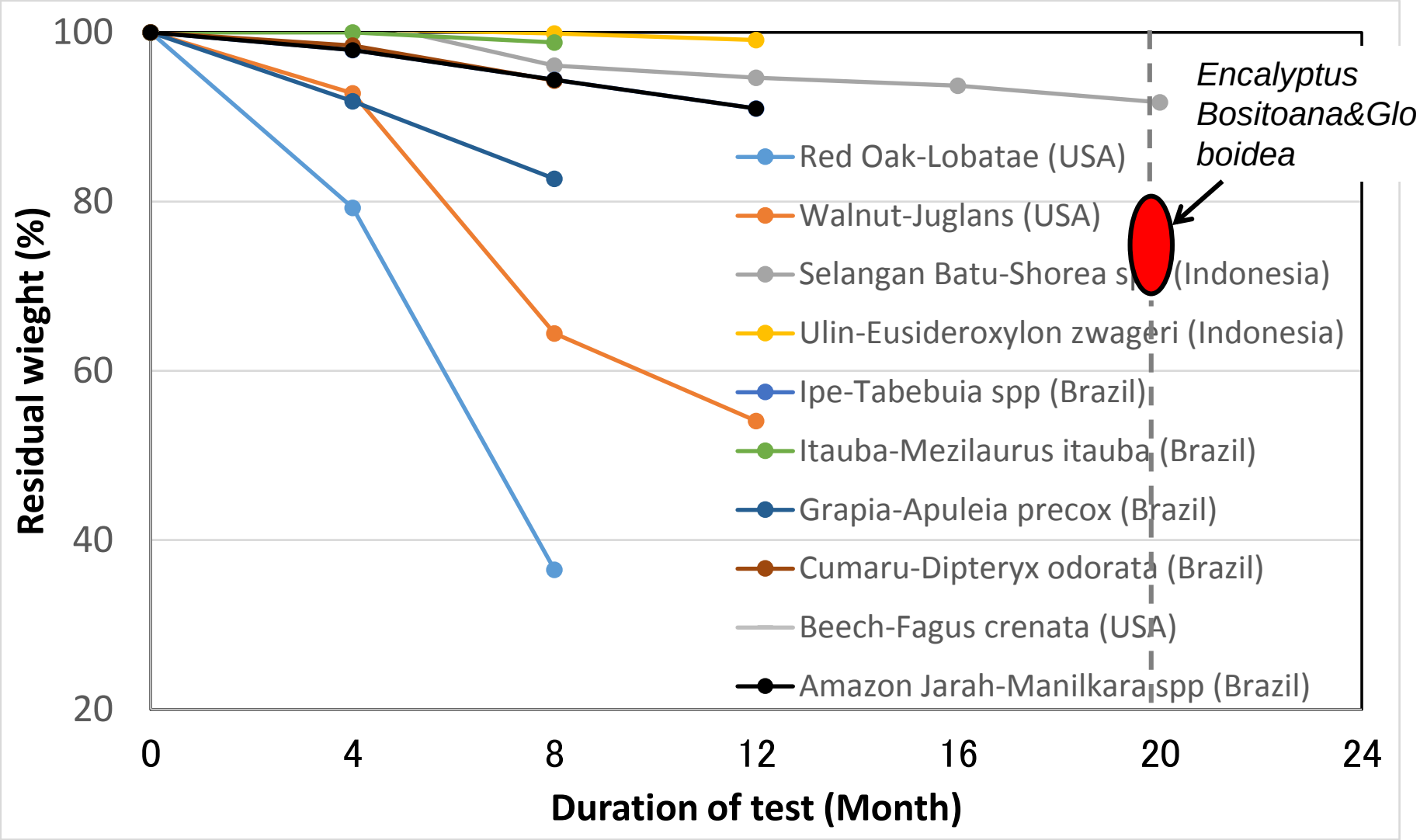
Last year…



3. Research: Durability of NZ grown Eucalyptus in Japan



3. Research: Durability of NZ grown Eucalyptus in Japan



3. Research: Durability of NZ grown Eucalyptus in Japan

Discussions

There is not much difference in decay resistance between *E. Bosistoana* and *E. Globoidea* at the stage.

It is still too early to make a conclusion about durability of *E. Bosistoana* and *Globoidea*.

Extractives content in each specimens are not sure. Need to check it.

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4. Topics: Large scale timber building in Japan

Japan Plans for Supertall Wooden Skyscraper in Tokyo by 2041

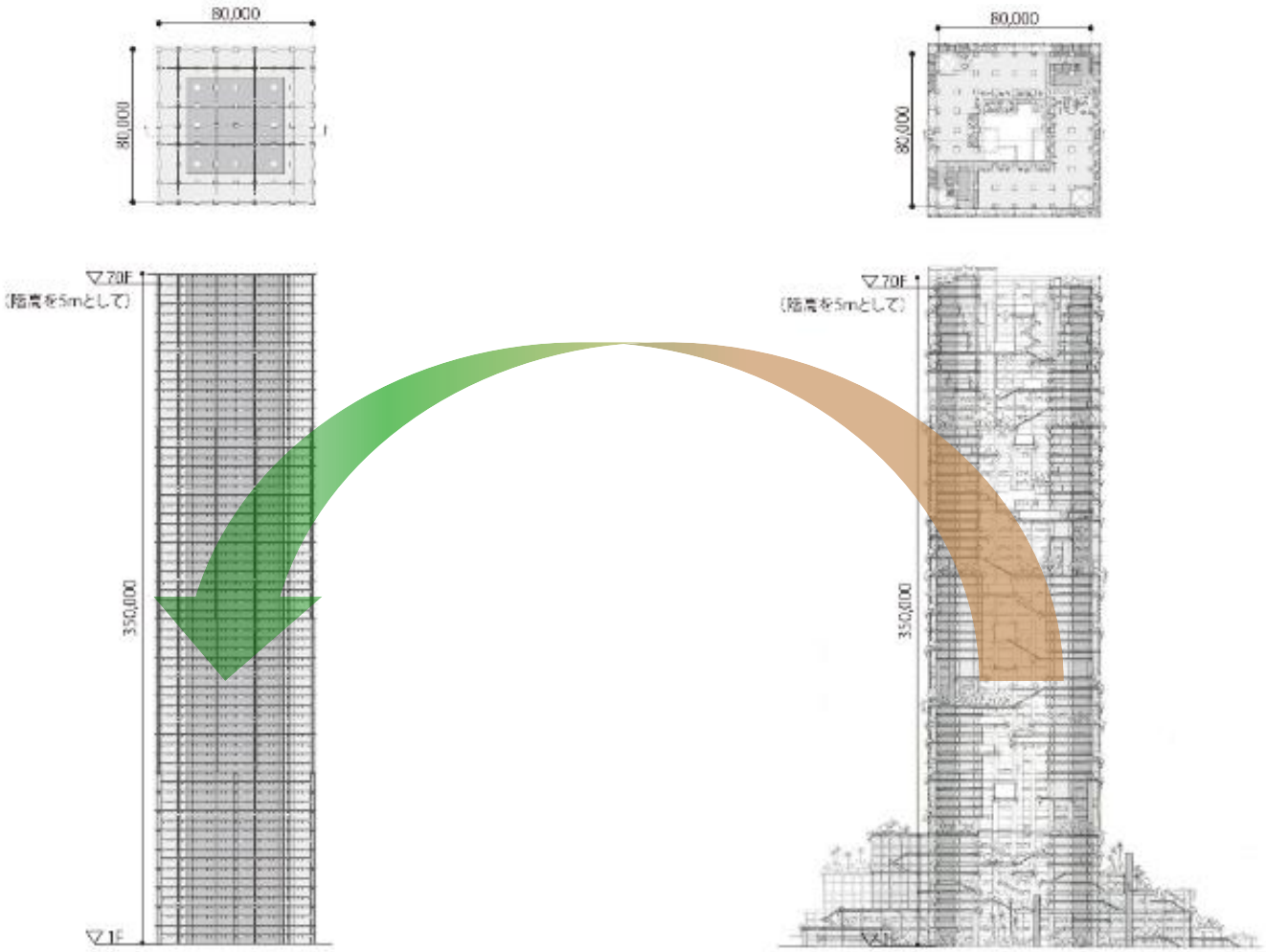
W350 Plan – A 350 m tall wooden building concept to become the focus point of an environmentally-friendly and timber-utilizing cities

Changing Cities into Forests

W350 Plan

Aiming to Create Environmentally-Friendly and Timber-Utilizing Cities

Two models – A 350 m tall wooden building concept to become the focus point of an environmentally-friendly and timber-utilizing cities



Technology model

Design model

Design Model

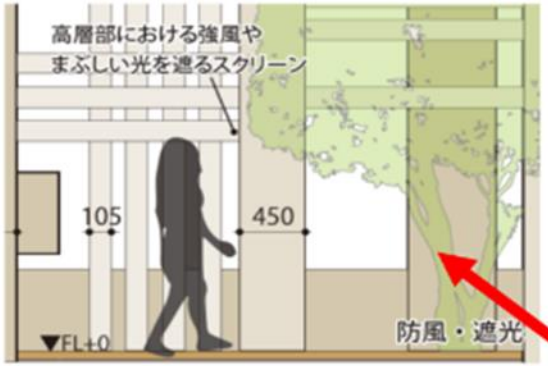
W350 Plan Design Model

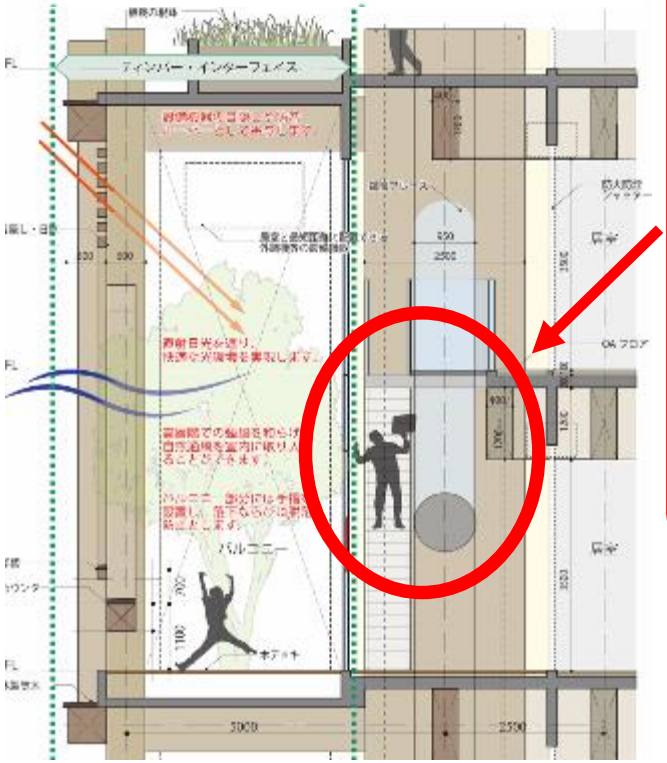
A model that visualizes the ideal concept as a wooden high-rise building and clarifies the target details.

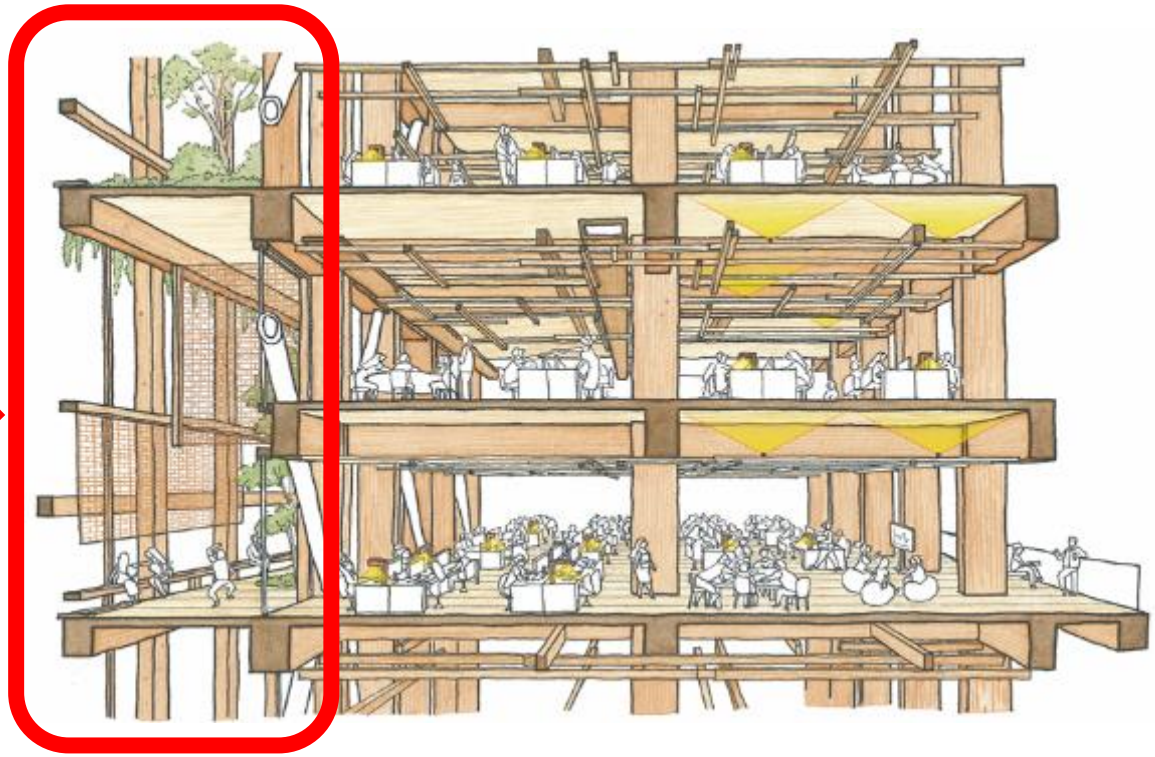
Design Model – Wooden exterior that links people to the outside “Timber Interface”

Exterior system utilizing the characteristics of a wooden building.
“Timber Interface” offers various functions such as a comfortable living environment, evacuation flow, a work platform and equipment shaft.

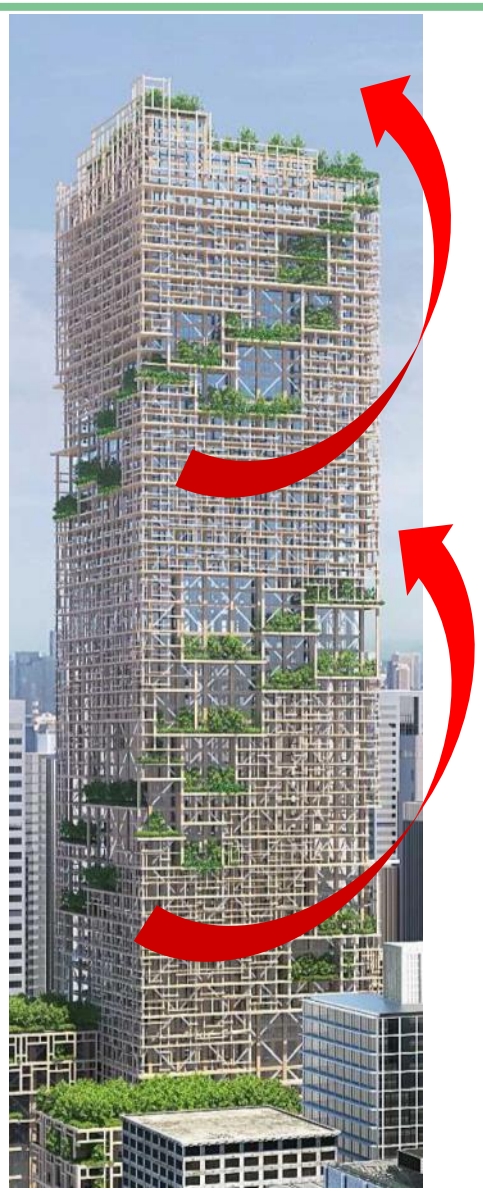
Design Model – Wooden exterior that links people to the outside “Timber Interface”

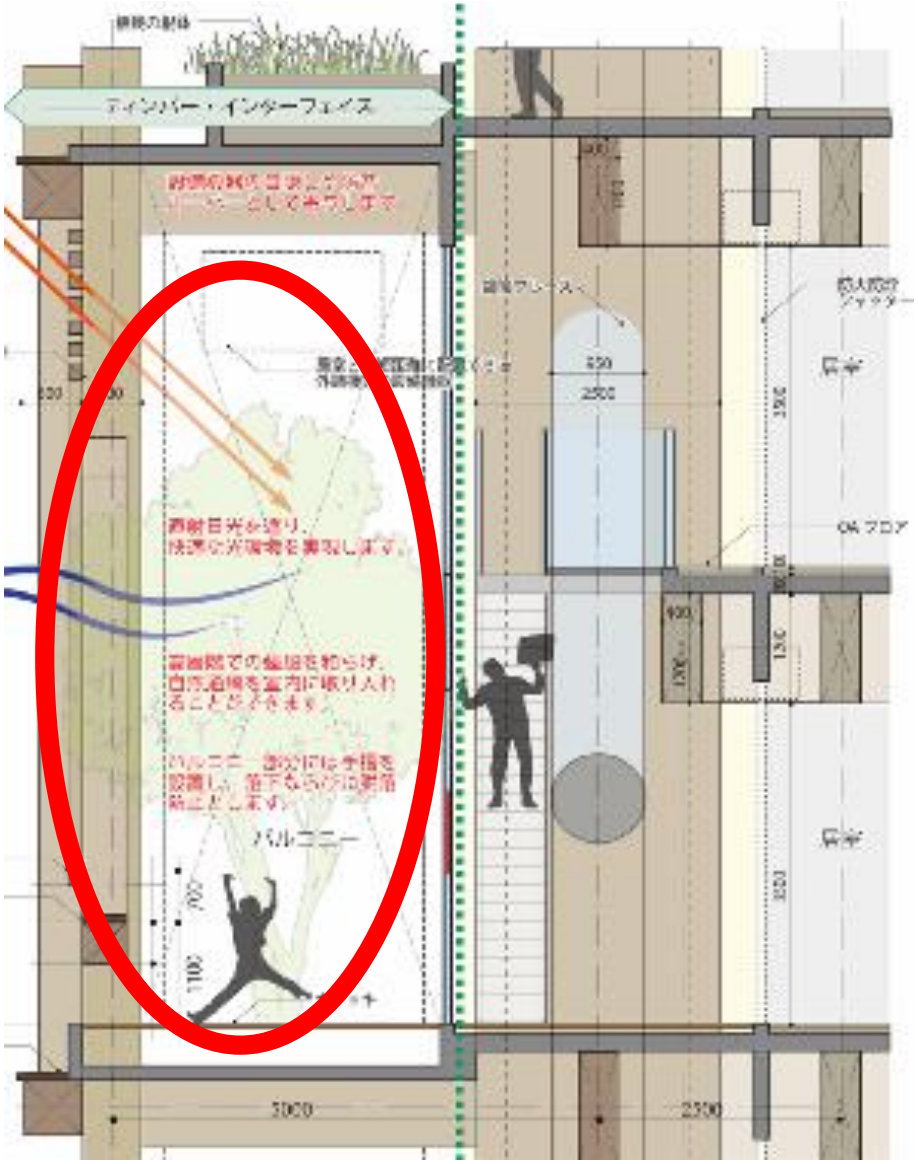






Design Model – Wooden exterior that links people to the outside “Timber Interface”





Design Model – Functional Greening and Landscape Linking to the City

Water source equipment combining the cultivation of greenery, disaster risk minimization, and aesthetics

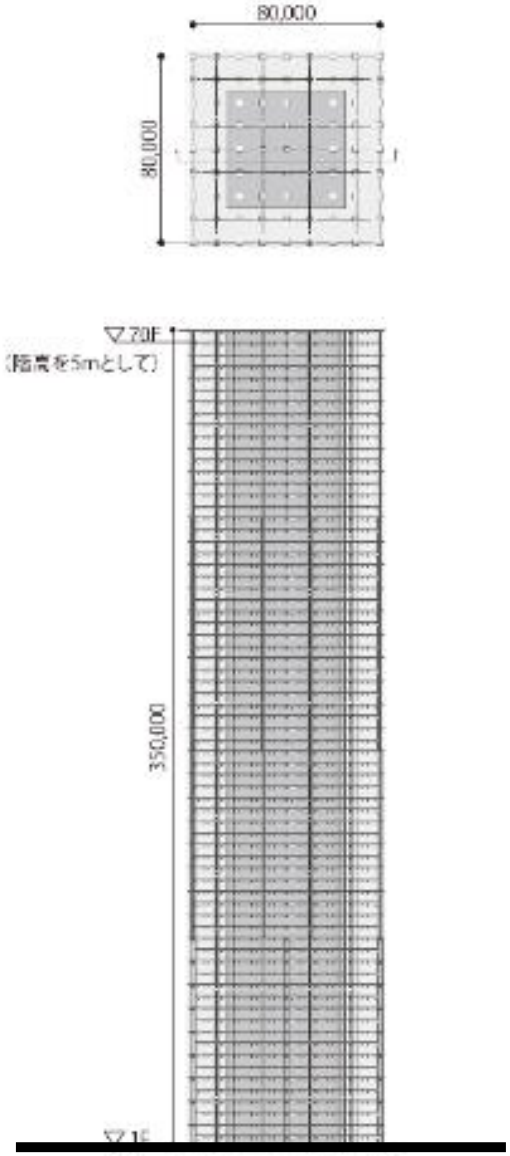
Technology Model

W350 Plan Technology Model

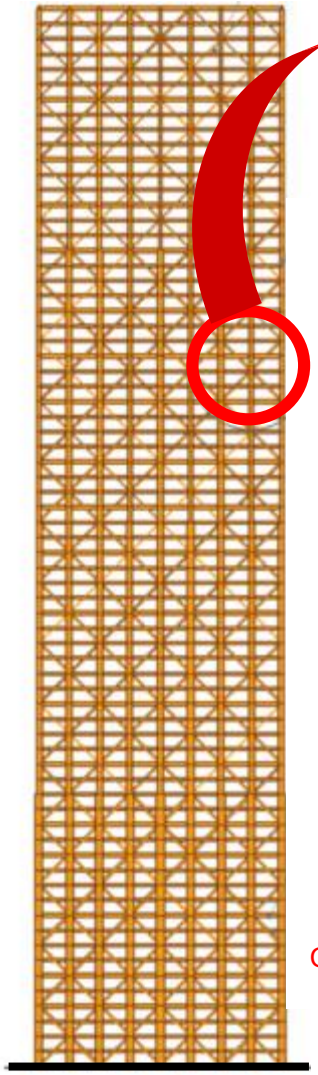
A verification model for realizing specific technologies.

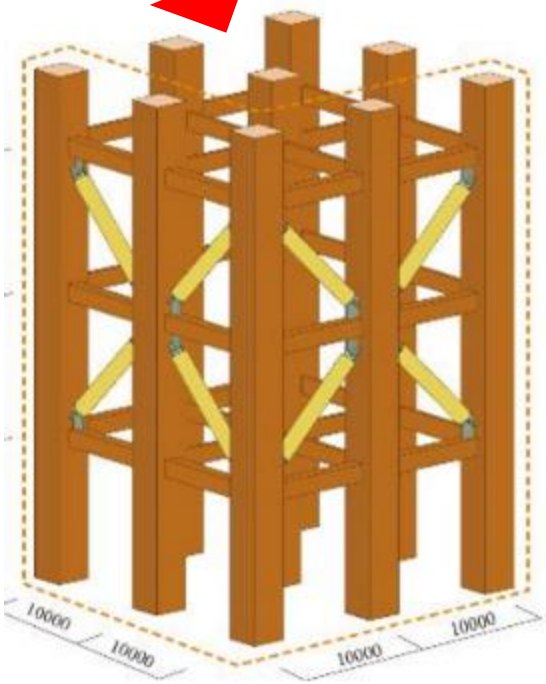
Wood and steel hybrid structure of right materials in the right places.

Issues to be addressed and anticipated technology.

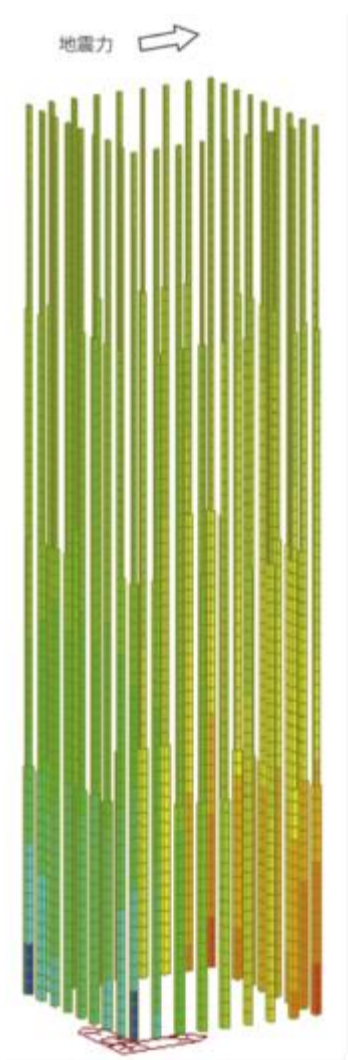


Technology Model – Stress Analysis

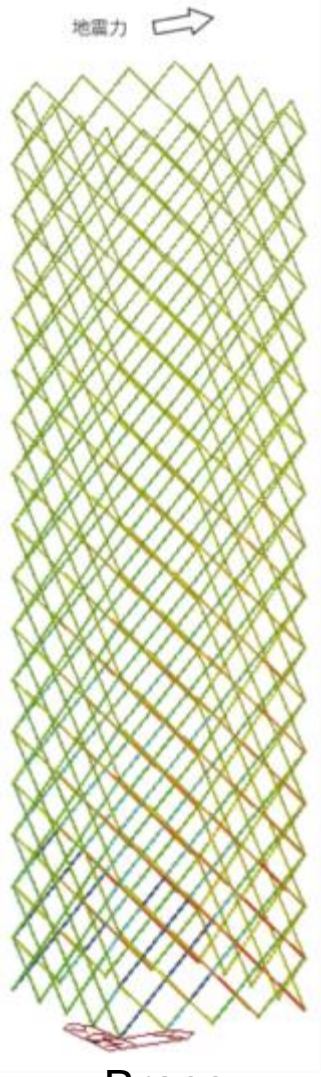




Internal structure (pure wood)
+
Outer circumference wood and steel hybrid structure
+
Steel pipe brace



Column



Brace

Incorporated framework

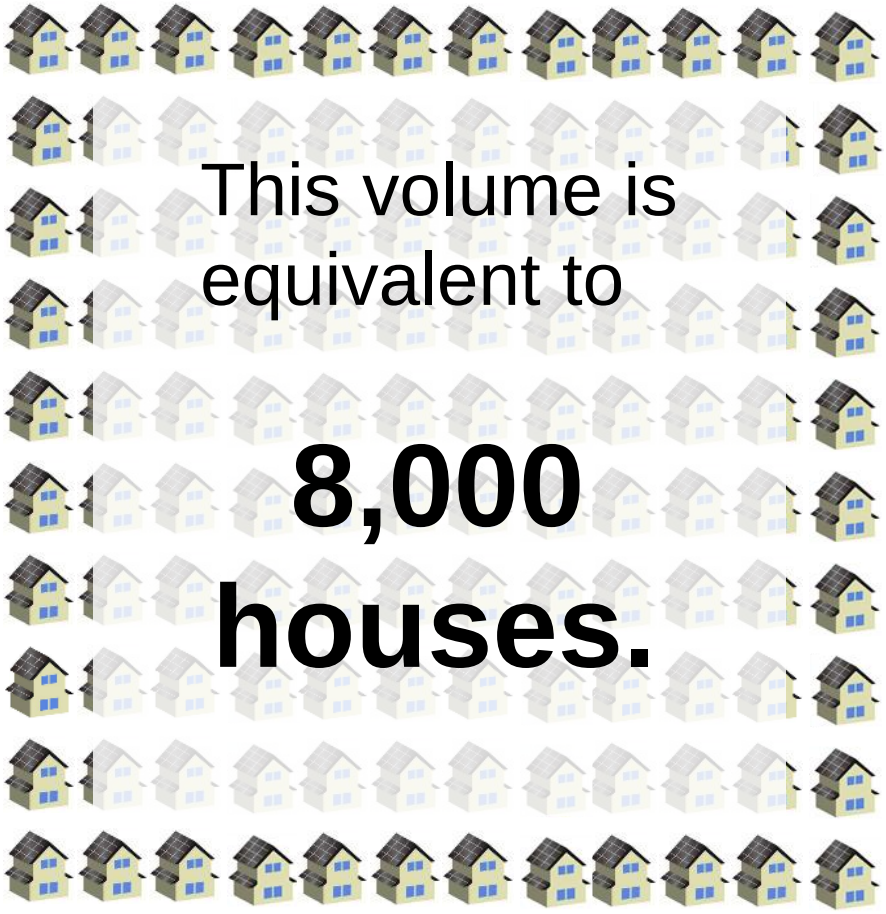
Stress deformation analysis

Assumed timber usage

Volume of wood
in w350

185,000m^3

=



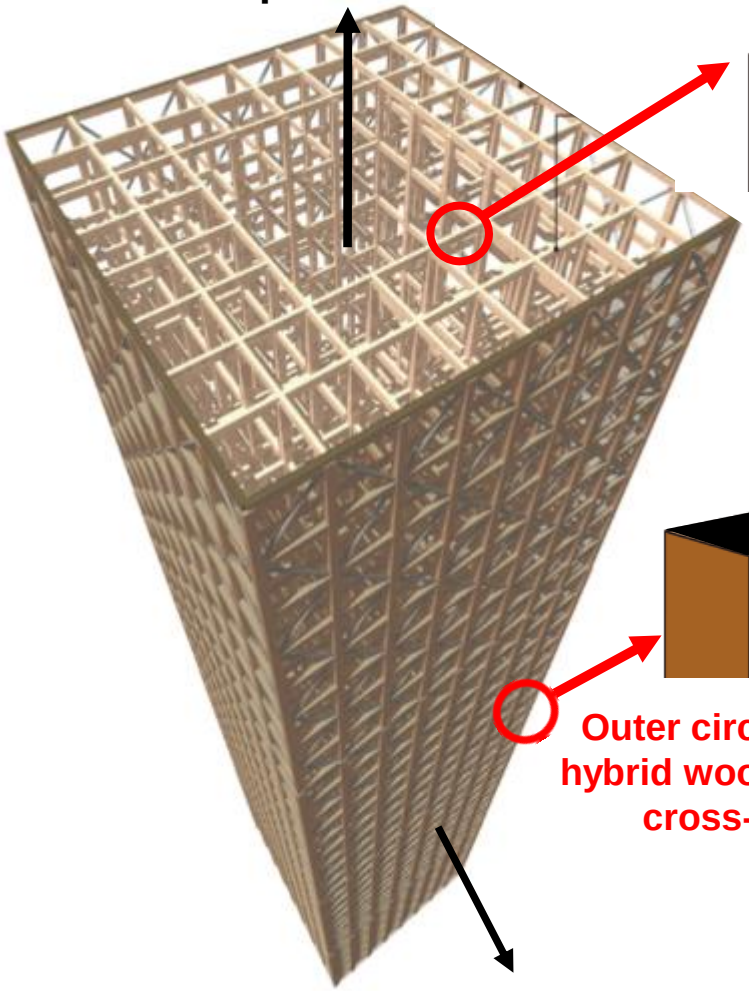
This volume is
equivalent to

8,000

houses.

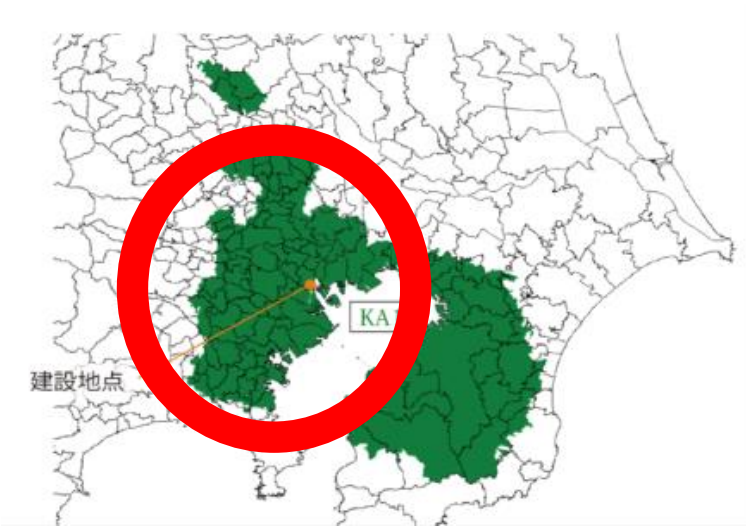
Technology Model – Structure Plan

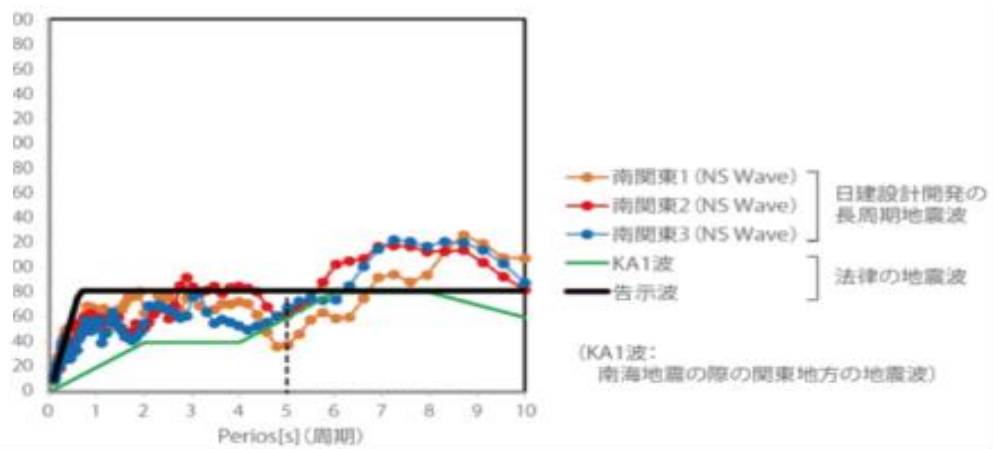
Structural material usage ratios by volume Timber : Steel 9 : 1



Brace tube structure fitted with steel frame vibration control braces on a wooden frame

Technology Model – Earthquake Eigenvalue Analysis

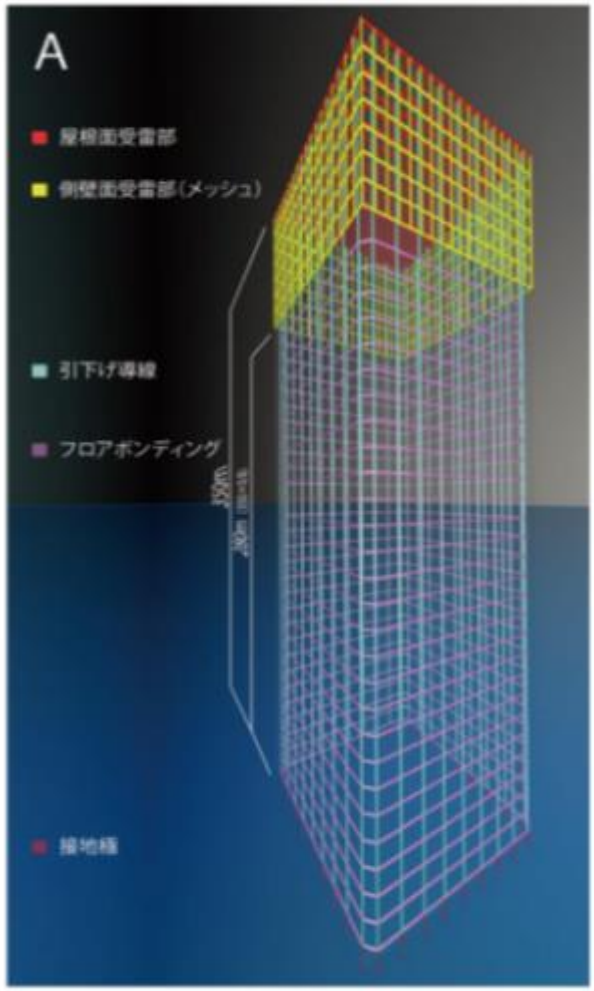




Regions subject to seismic motion/pseudo response spectrum

Eigenvalue analysis

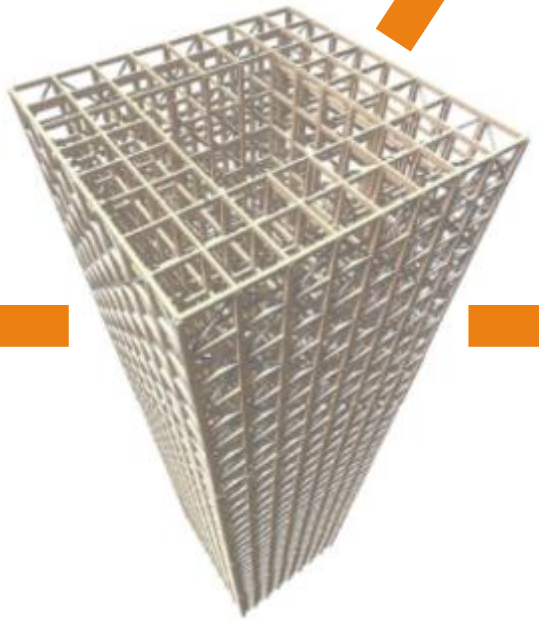
Issues and Anticipated Technology



Lighting protection system proposal

Proposal for urban fire prevention/fire progression prevention measures

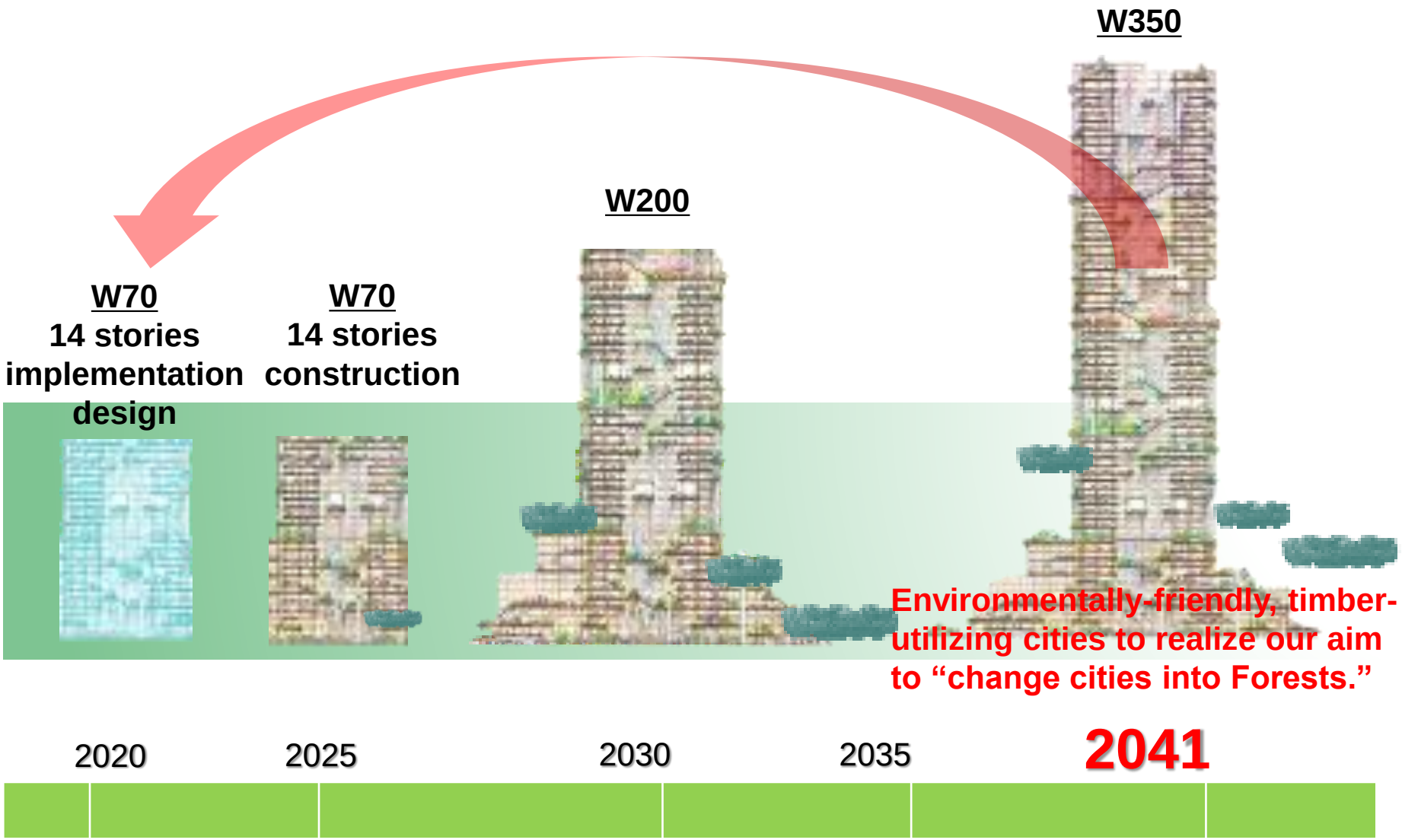
Fire-resistant trees/water film equipment



Technology for using only wooden materials as much as possible and stopping burning with wood alone (currently under development)

Development of 3 hour fire-resistant Timber materials

Roadmap



W350 Plan Initiation


Thank you/Kapai /Arigatou