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The Trend of Sustainable Building in Japan

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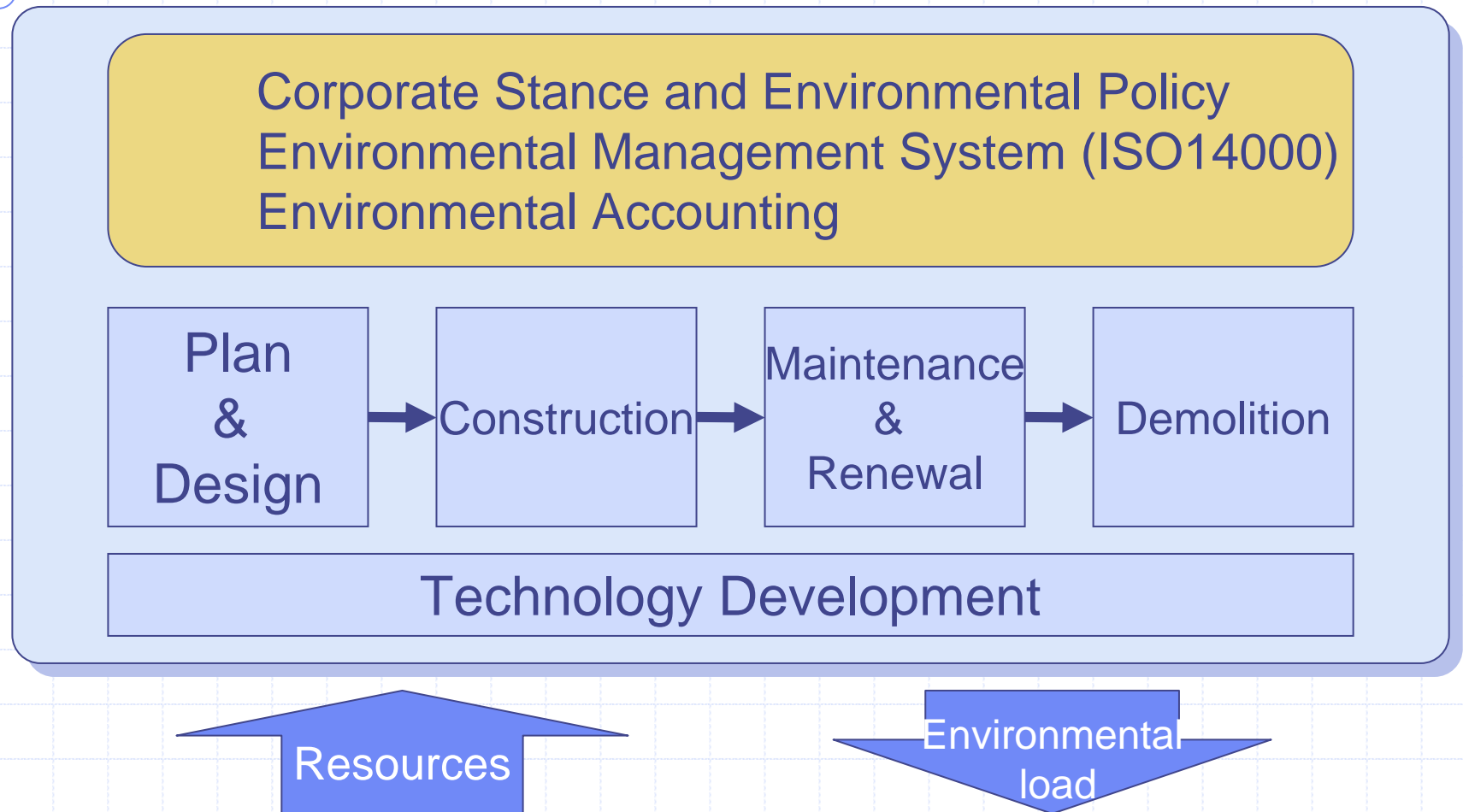
- **Building Contractors Society (BCS)**
- **Obayashi Corporation**

'Sustainable Building'

- ◆ building that can moderately maintain or improve the quality of life
- ◆ harmonize with the climate, tradition, culture, and the environment in the region,
- ◆ while conserving energy and resources, recycling materials, and reducing hazardous substances within the capacity of the local and global ecosystems throughout the building life cycle

Source:Sustainable Building Subcommittee, Global Environment Committee
Architectural Institute of Japan

Business field & Basic Policy for Global Environment Issue



Source: Handbook of Construction Industry 2002

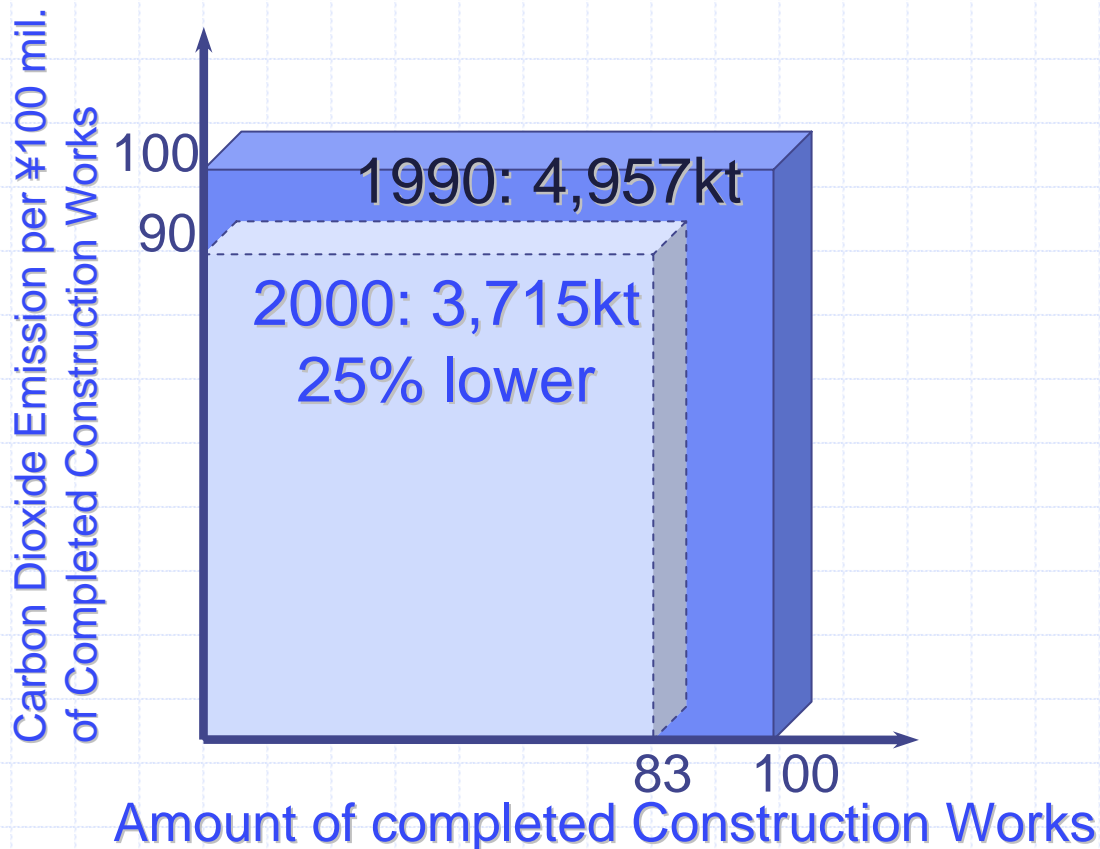
Japan Federation of Construction Contractors, Japan Civil Engineering Contractors' Association and BCS

Action Plan for Global Environment Issue

- ◆ Global Warming Measure
 - 12% reduction in Carbon Dioxide Emission(1990 2010)
- ◆ Sustainable Cyclic Economy & Society
 - Reduction of Construction waste (by 2000)
 - ◆ Final Disposal Volume 20%
 - ◆ Recycle Volume 80%
- ◆ Preservation of Tropical Forest
- ◆ Environment Management System (ISO 14000s)
- ◆ Preservation of Natural Eco-System

Result of Activities

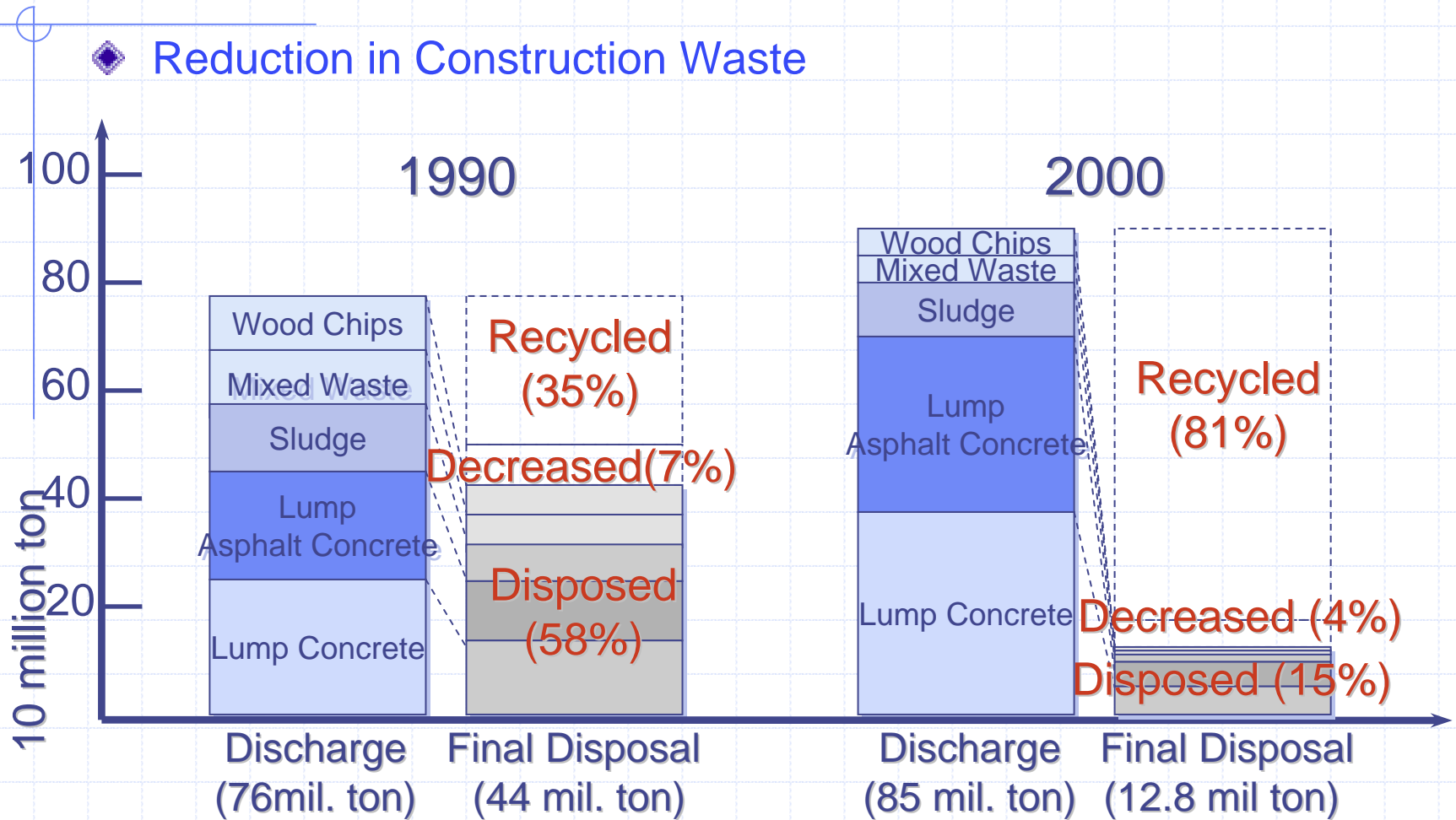
◆ Reduction in Carbon Dioxide Emissions



Source: Handbook of Construction Industry 2002

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Result of Activities



Source: Handbook of Construction Industry 2002

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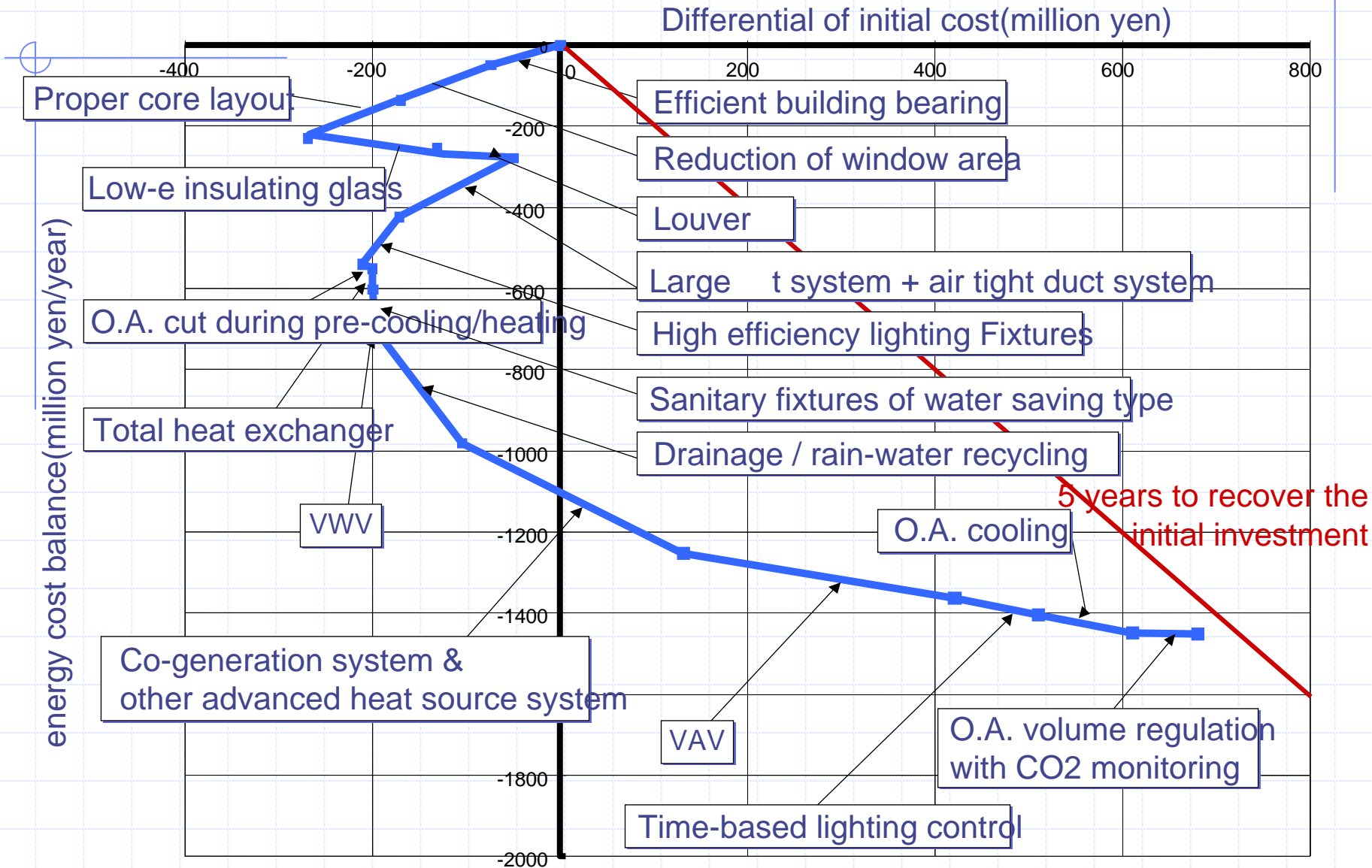
1. PLAN & DESIGN PHASE

- ◆ Energy-Saving/Material Saving/Longevity
- ◆ Reduction of Construction By-product
- ◆ Green Purchasing
- ◆ Chemical Material Management
- ◆ Preservation of surrounding environment

Eco Navi™

- ◆ Computer program to assess the effect of energy- saving techniques for building design
 - Initial Cost
 - Energy Cost
 - Carbon Dioxide Emission in Life

Thermal Economics Vector Diagram



2. CONSTRUCTION PHASE

- ◆ Construction Method of Energy Saving
- ◆ Discretion of construction by-products, Recycling, Zero Emission
- ◆ Reduction of Tropical Wood Form
- ◆ Green Purchasing for Temporary work

Mileage Driving of Truck and Construction Machinery

◆ Reduction of Carbon Dioxide Emission

■ Truck

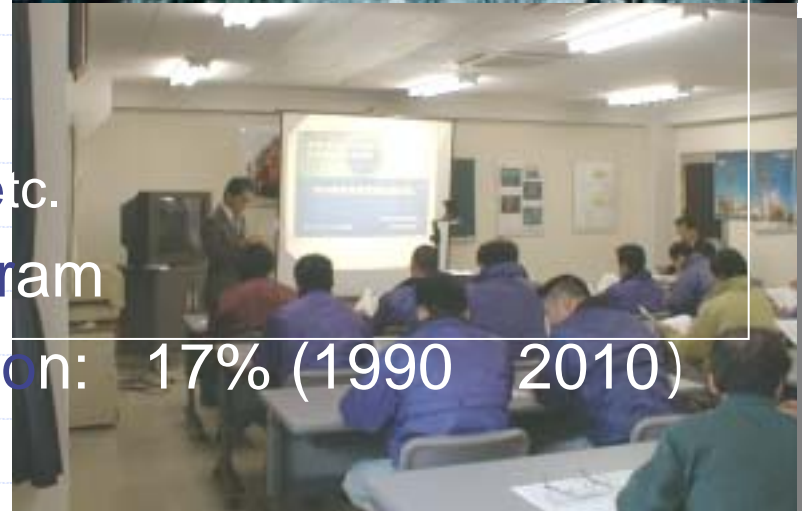
- ◆ Reduce Revolutions of Engine at Shift Up
- ◆ Earlier Shift Up
- ◆ Constant & Economical Speed
- ◆ Engine Braking for red signal
- ◆ Reduce Idling Time

■ Construction Machinery

- ◆ Crane, Back Hoe Shovel etc.

■ Seminar & Training Program

- Company Aim of Reduction: 17% (1990 - 2010)



Zero Emission

- ◆ 100% Recycling of Construction Waste as Resources
 - Common Awareness
 - Reduction of Waste
 - Segregated Collection
 - 100% Recycling as Resources

◆Project:	Dentsu Head Office
◆Place:	Tokyo, Japan
◆Completion:	October 2002
◆Total Floor Area:	231,000sq.m
◆Architects	Obayashi Corporation Ateliers Jean Nouvel The Jerde Partnership International, Inc.



◆Zero Emission

◆Dentsu Head Office Construction site

- Common Awareness
- Reduce of Waste
- Segregated Collection
- 100% Recycling as Resources



Recycling Station



■Materials with no/simple packing



■Discretion by Screening

3. POST-CONSTRUCTION

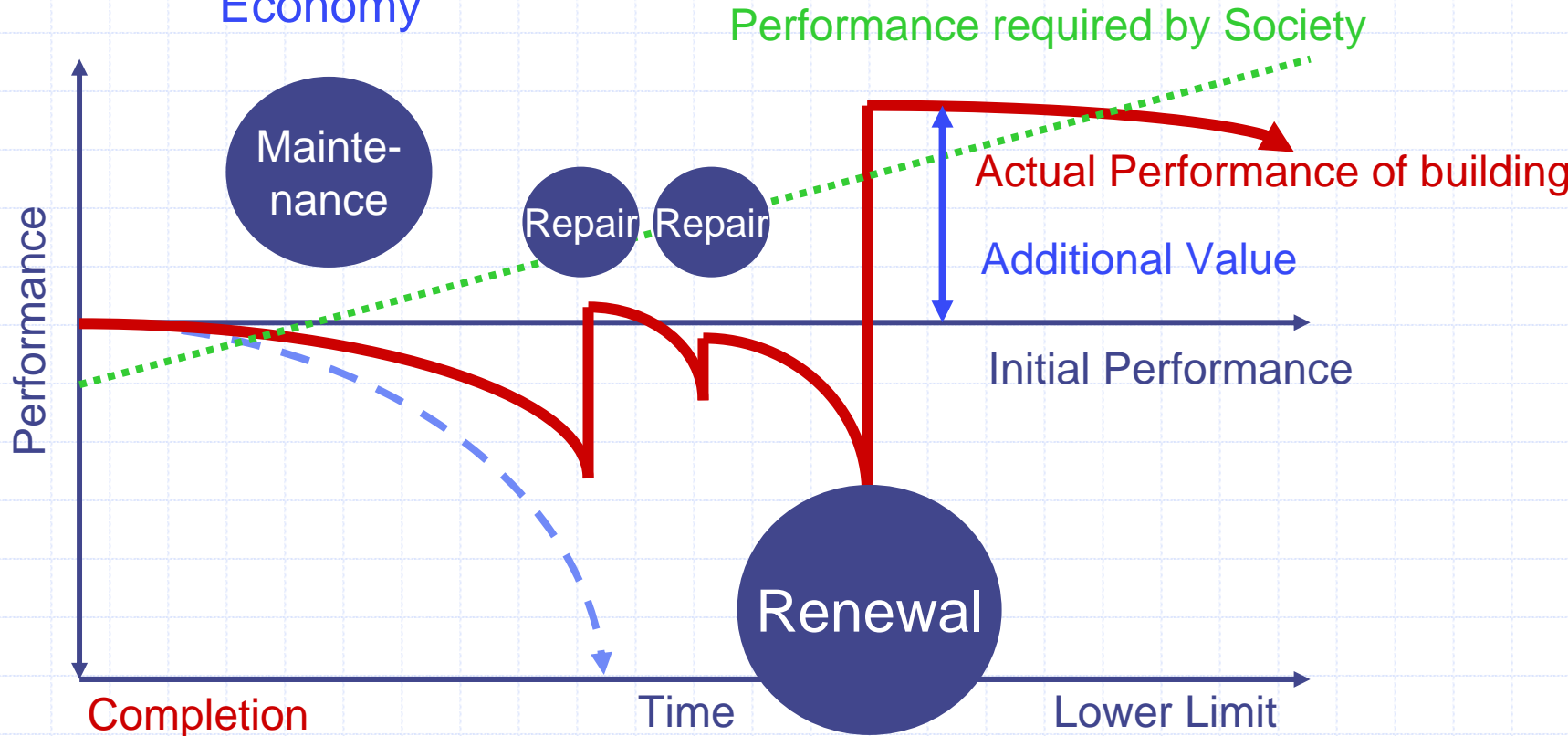
Maintenance, Renewal, Demolition

- ◆ Energy Saving measure
- ◆ Longevity by Retrofit Seismic Devices
- ◆ Examination of Concrete
- ◆ Life Cycle Management
- ◆ Segregated Collection for Recycling
- ◆ Others

Life Cycle Management of Building

◆ Maintain and Rise Value of Building

- ◆ Function, Safety, Environment, Design&Amenity, Economy



◆Renewal of Dai Hanshin Building

◆Department Store built in 1941

◆ Building Service Equipment (1994-1997)

- Rise of Capacity, Reliance and Safety of Building Services
- Saving Energy Cost
- Saving Space for Building Service Equipment etc.

◆ Exterior Closure (2002)

◆Place:

Osaka, Japan

◆Completion date:

1941(Original)

2002 (Renewal)

◆Total Floor Area:

97,119sq.m

◆Architects&Engineers:

Obayashi Corp.(Renewal)



◆Renewal of Dai Hanshin Building

◆Department Store built in 1941

◆ Building Service Equipment (1997)

◆ Exterior Closure (2002)

- Resume Function and Safety
- Stylish Façade Design presenting Future Department Store



After Renewal (Night Time)



After Renewal

Remarks toward the Sustainable Society

- ◆ Environment Consisting with Economy
 - ◆ Measures at Every Phase of Building
 - ◆ Longevity of Building as Fine Heritage
-
- ◆ Share the Common Awareness about the Global Environment issue in the entire Asian Region to promote the movement toward Sustainable Society



END

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Building Contractors Society, Japan

Obayashi Corporation