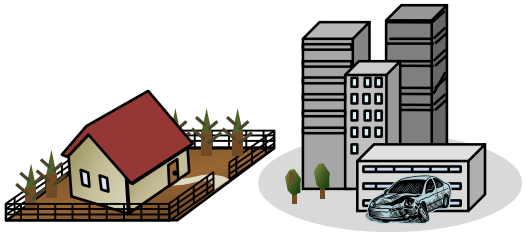
②Building Scale

Research on buildings to improve energy saving performance and to reduce environmental load by measuring surveys and field surveys



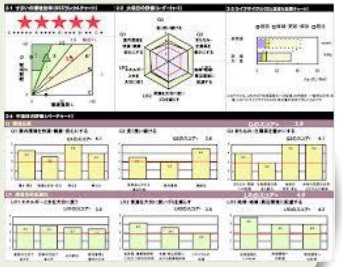
School Construction

Renovation for Energy Saving

Life Cycle Carbon Minus House

Research Flowchart

Understanding indoor environment states and current lifestyles by measuring and questionnaire surveys.



Simulation
Statistic Analysis

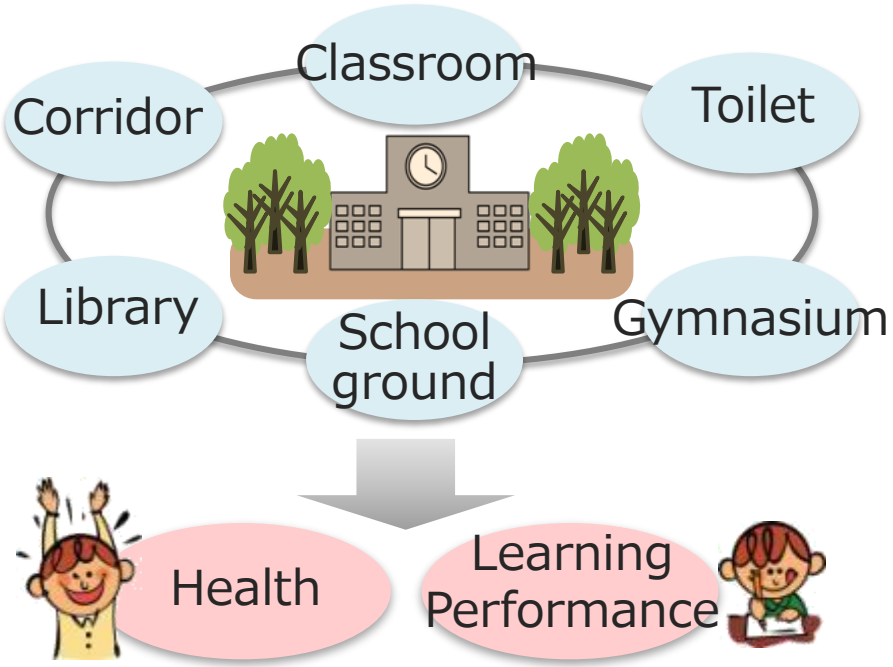
Evaluation of buildings in terms of energy saving and health performance by simulations and statistic analysis.

Comprehensive Assessment of School Environment

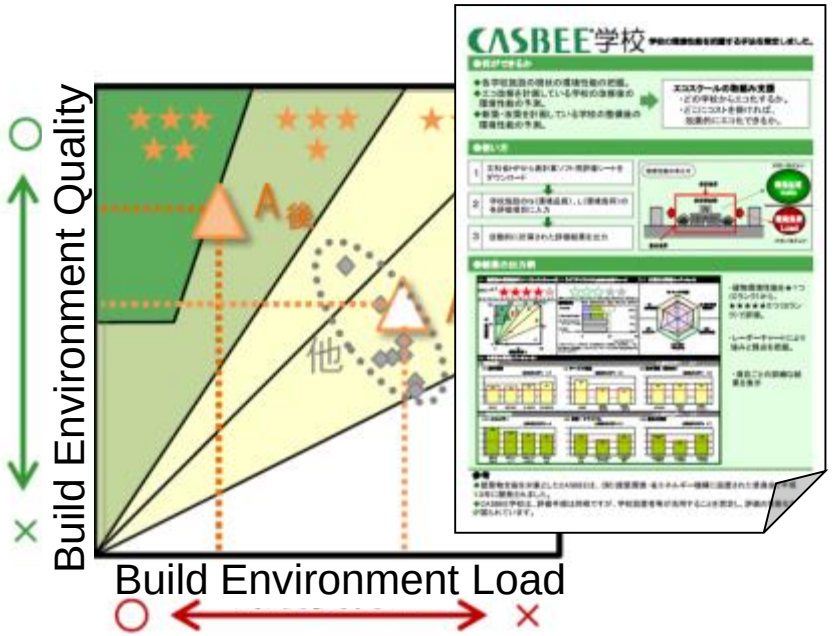
Background Concerns about effects of school environment on students

Purpose Comprehensive assessment of school environmental efficiency considering students' health and learning performance

1. Elucidate the effect of various school spaces on students'.



2. Proposal of an assessment system based on 'CASBEE-school'



➡ Suggestion of the effective and efficient improving school environment

Field Survey on Child's Physical Activity in Elementary School

Background Decline of child's physical ability and bipolarization of exercise habit

Purpose To clarify the relationship between school environment and child's physical activity

School Environment

School Facilities
School yard area,
Class room arrangement

Program of School
Original programs to encourage physical activity

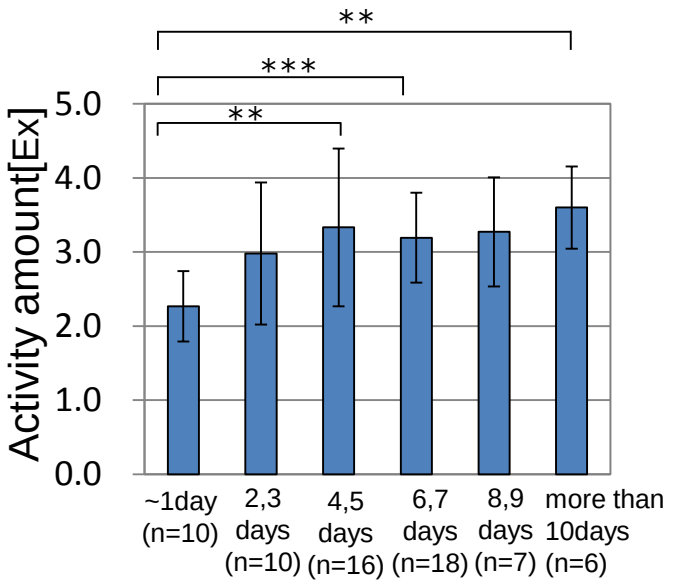
Satisfaction for Facilities
Width of school yard,
Brightness, Dustiness

Physical Activity of children

How to spend intermission
Frequency of playing outside

Objective indicator
Activity amount
Walking steps

Number of days of playing outside during intermission



Number of days playing outside during the survey(16days)

(** : p<0.05, * : p<0.10)

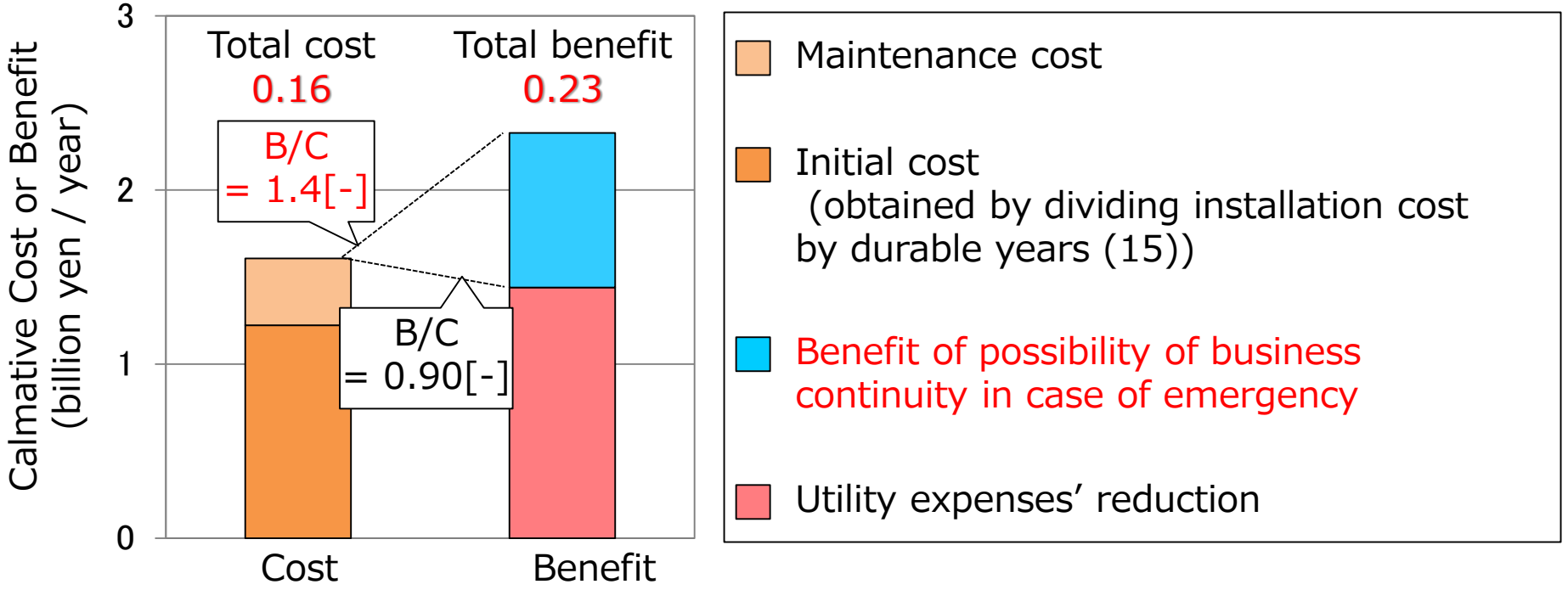
Improvement of school environment in regard to child's physical activity

Study on the Regionally Energy Use

Background To install “Smart Energy Network” is highly required as a disaster countermeasures

Objective Cost – Benefit assessment of “Smart Energy Network” taking business continuity into account in case of emergency

◆Cost – Benefit Assessment Result of installing “Smart Energy Network”



➡ Visualizing each benefit will give support to promote installing SEN

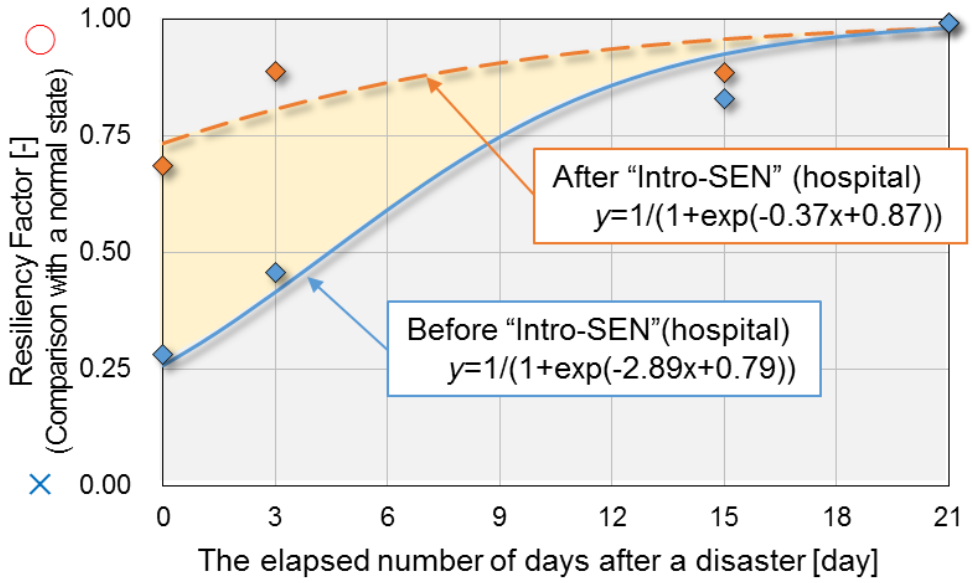
* Smart Energy Network : Optimum energy system of a regional basis based on “Local production for local consumption” of heat and electricity

Improvement of Resilience Performance by Introducing a Smart Energy Network

Background The promotion of a Community Energy System with the supply disruptions of energy

Purpose
- Quantification of business continuity performance
- Estimation of improvement of resilience performance by introducing a Smart Energy Network (SEN)

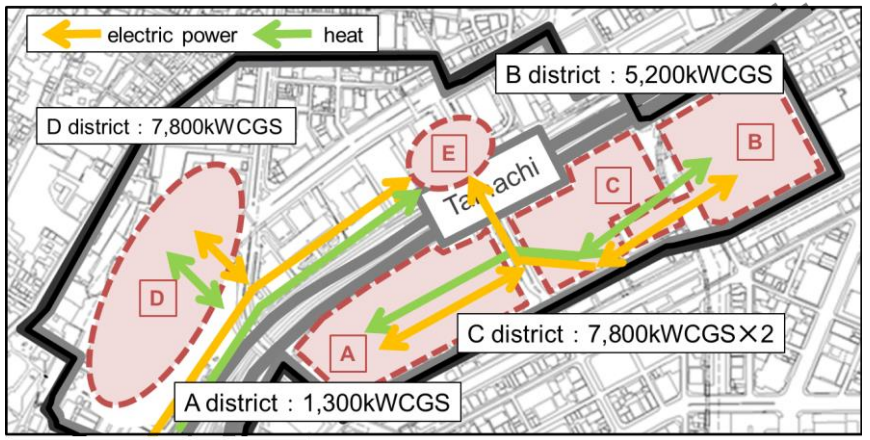
◆ Conducted a questionnaire survey



⇒Quantification of business continuity performance

◆ Case Study

Minato-ku,Tamachi surrounding area



Effect of loss avoidance by introducing SEN

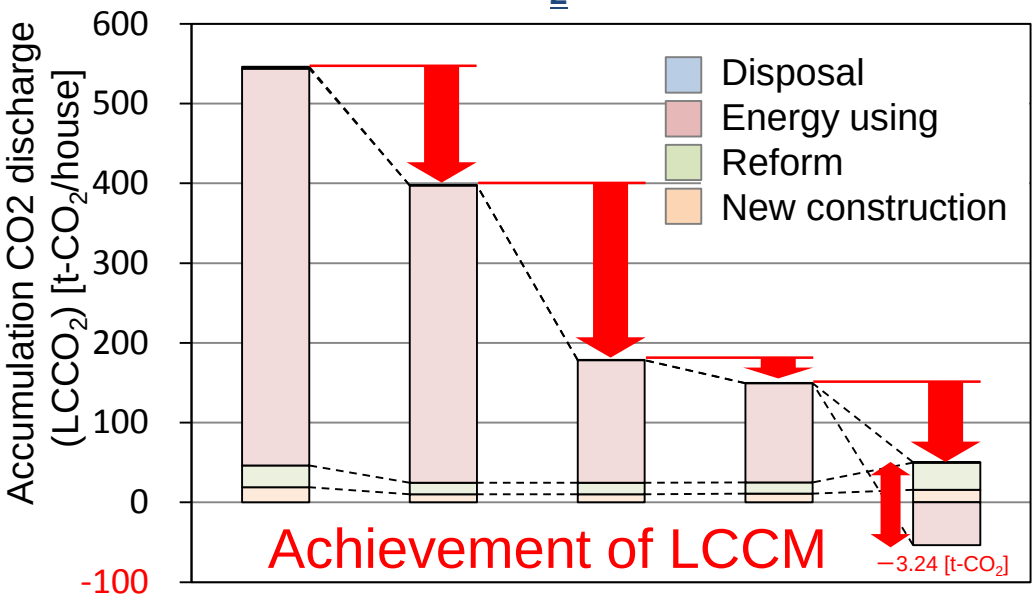
In the entire district

110 million yen a year

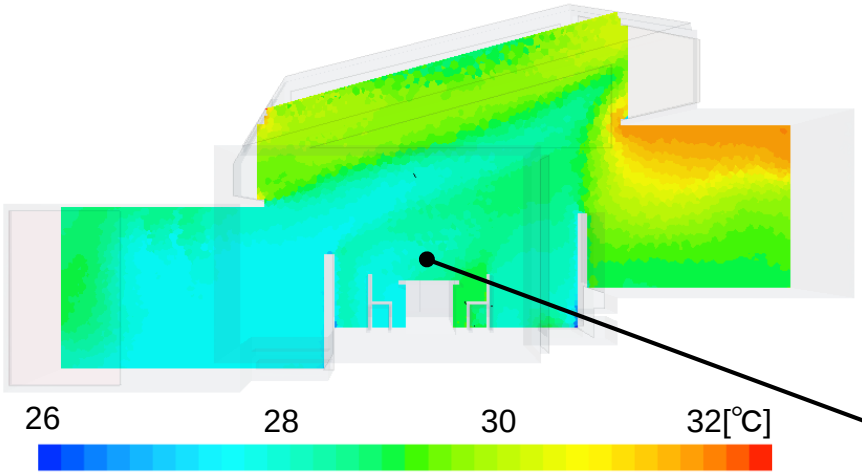
⇒ Estimation of improvement of resilience performance by introducing a Smart Energy Network

Study for the net zero energy house realization(1/2)

◆ Result of $LCCO_2$ estimation



◆Result of temperature simulation

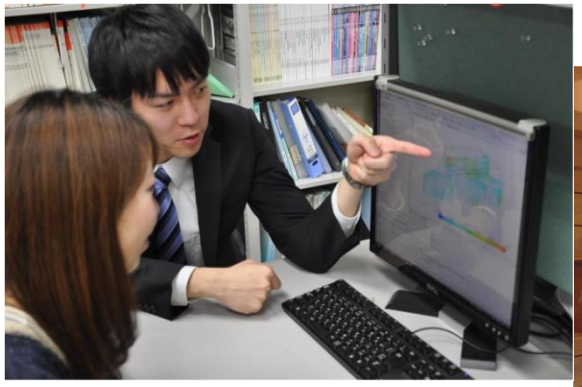


Case	General house (old-energy saving standard)	Keio Co-Evolving house	
Additional-measures		・natural material ・insulation reinforcement	Solar heat utilization system
		Control system introduction	Solar panel (3.5kW)

Indoor temperature 28℃
＋ The ventilation
⇒Reduce the risk of heat stroke

➡ Realization of energy-saving and comfortable net zero energy house

Study for the net zero energy house realization(2/2)



▲Simulation

▼Wooden Interior

▲Wind Velocity Measurement

▲Field Validation

▼Crowded with visitors

▲The study is continued