

ICEBO / APCBC

**Asia Pacific Conference on
Building Commissioning**

2006.11.7

Opening Address

Energy / Environment / Commissioning



/ NESTEC

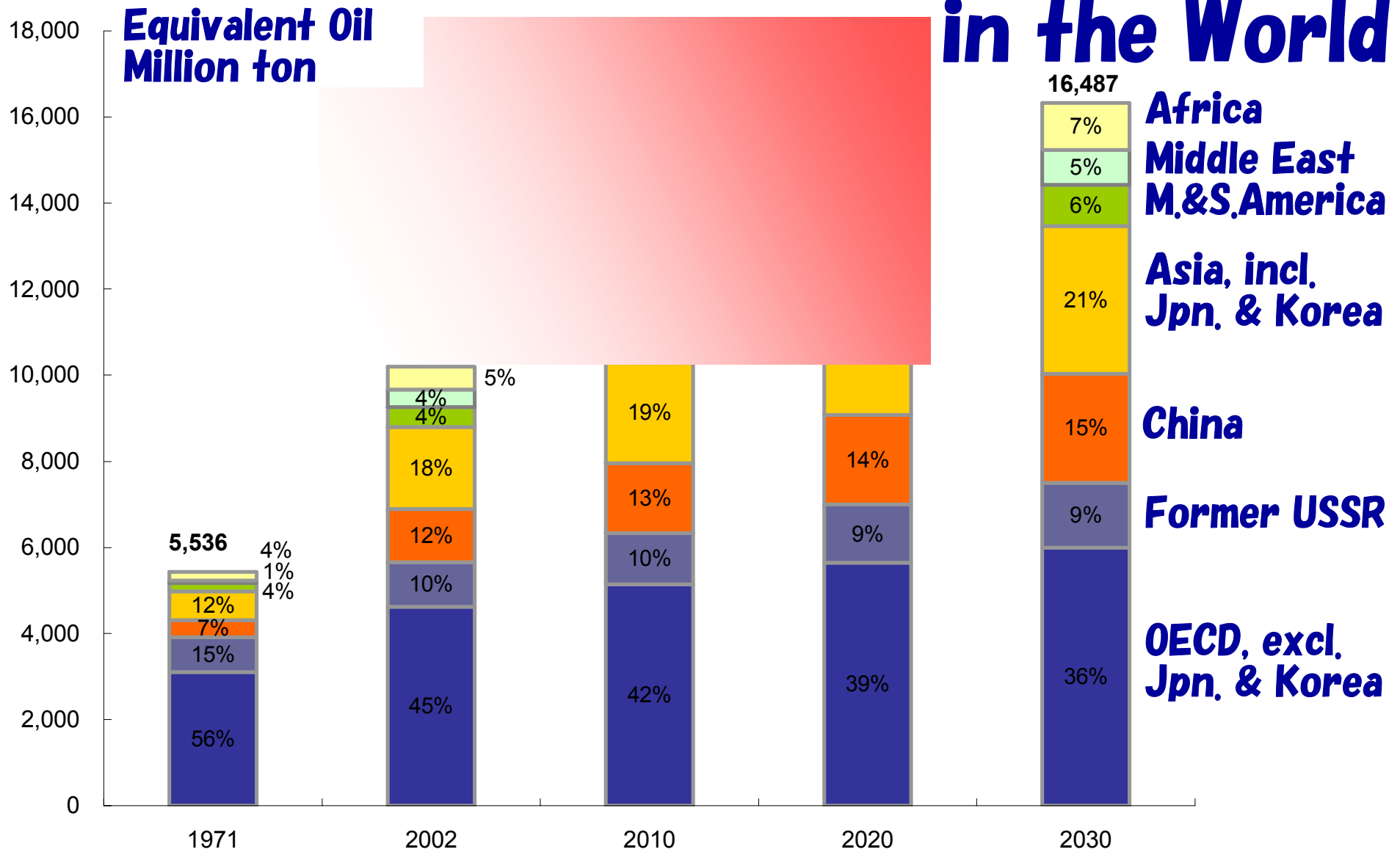
Nobuo Nakahara

NESTEC

Call for participation to International Conference for Asia Pacific at NCBC 2006

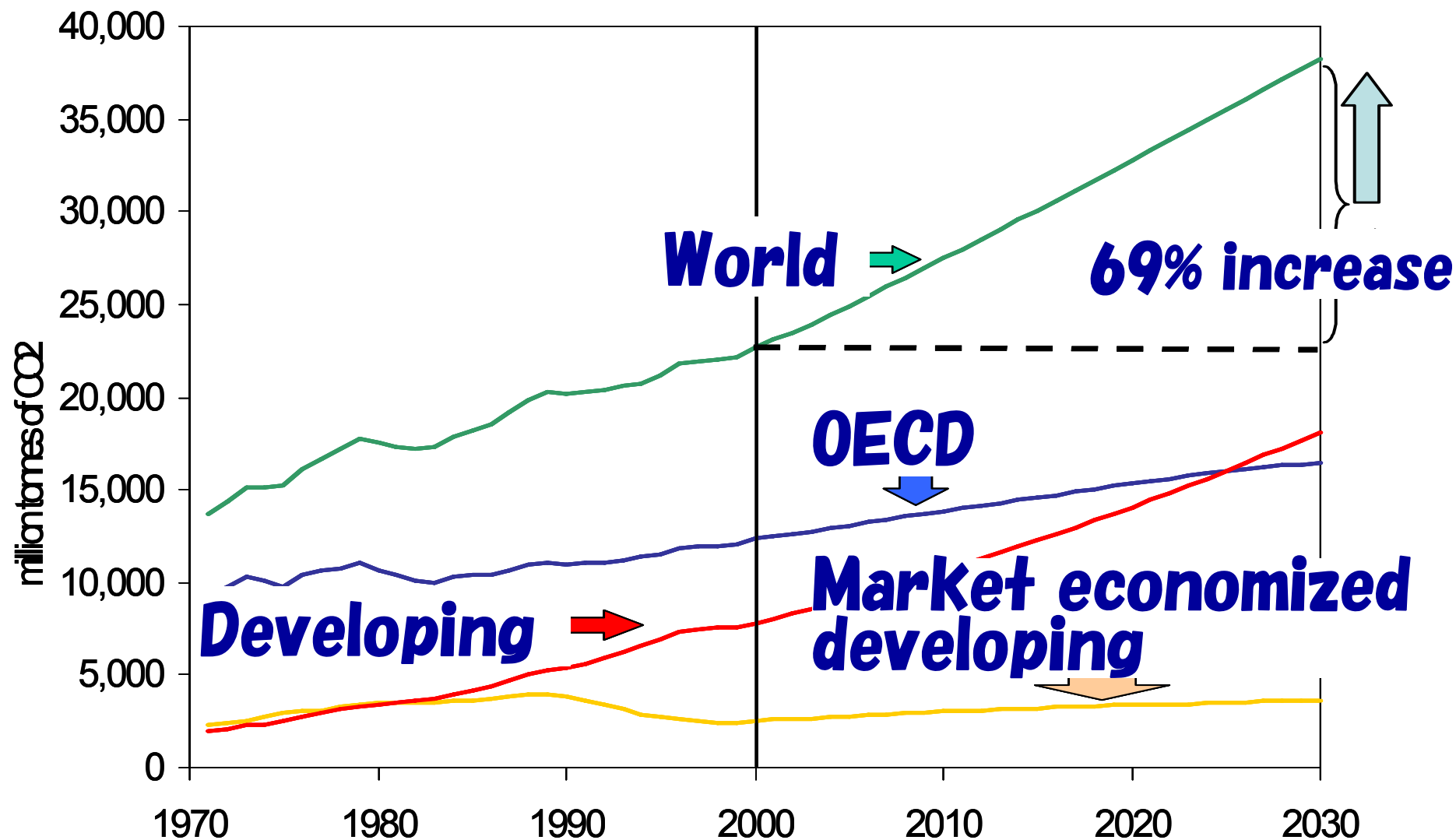
- **Asia Pacific Conference on Building Commissioning, APCBC has been planned to kick-off in Shenzhen in Nov. 6-8, 2006, together with**
 - **Annex 47, IEA/ECBCS**
 - **ICEBO 2006**
- **HKBCxC, Hong Kong Building Commissioning Center, is to co-sponsor and other bodies from mainland China and Asian countries are expected to participate.**
- **Commissioning bodies such as PECL, BCA, etc. in USA are desired to participate in this conference.**

Actual and Estimated Energy Demand in the World



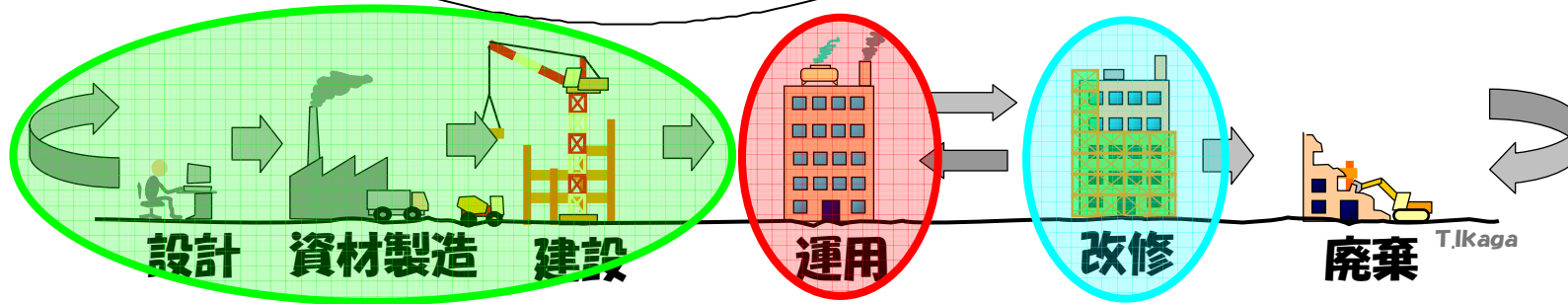
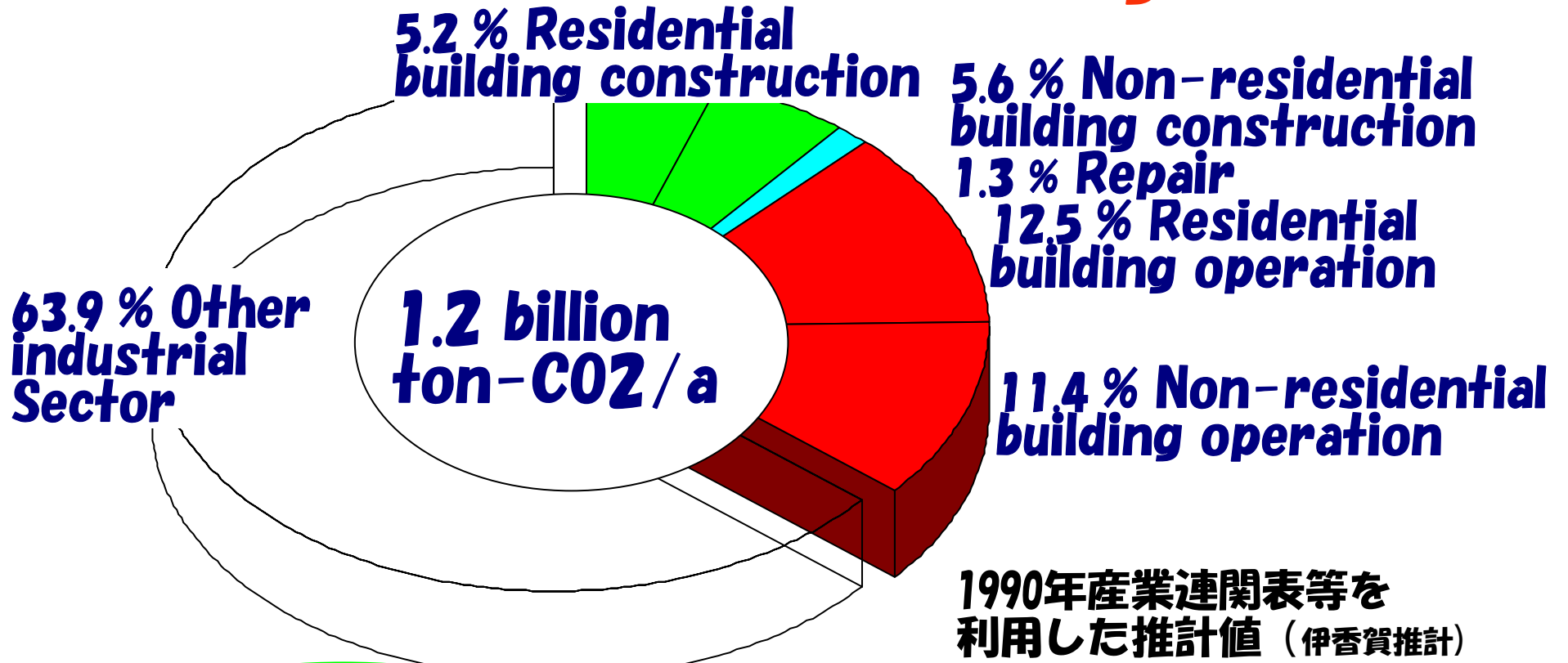
From IEA/World Energy Outlook 2004

Energy-originated CO₂ in the World



From data

Origin of CO2 generation in Japan, A third comes from Building sector



伊香賀俊治 (慶応大)



Four Principles of Reformation of Building, Town and Globe

- ***Environmental Circle Principle***
- ***Energy Conservation Principle***
 - ***Commissioning Principle***
 - ***Evaluation Principle***

How Building & Urban Energy System shall be completed and maintained?

■ Mechanism of Urban Environment State Change

– Virtual/Vicious Circle of Man-Environment-Resource/Energy

■ Principle of Energy Conservation

■ Recognize the Big Effect of Commissioning Process from Program to Maintenance

■ Proper and Unbiased Evaluation System for Energy / Environment / Sustainability

Principle of Environmental Circle

Economy / Society
Health / Hygiene

Man

Comfort / Efficiency

Indoor Env. Load for Control (Enthalpy)

Active System

Passive System

Building / Urban
Energy / Env.
Planning

Resource / Energy Conservation

Outdoor Env. Load for Control (Entropy)

Resource / Energy

Chemical / Thermal Pollution

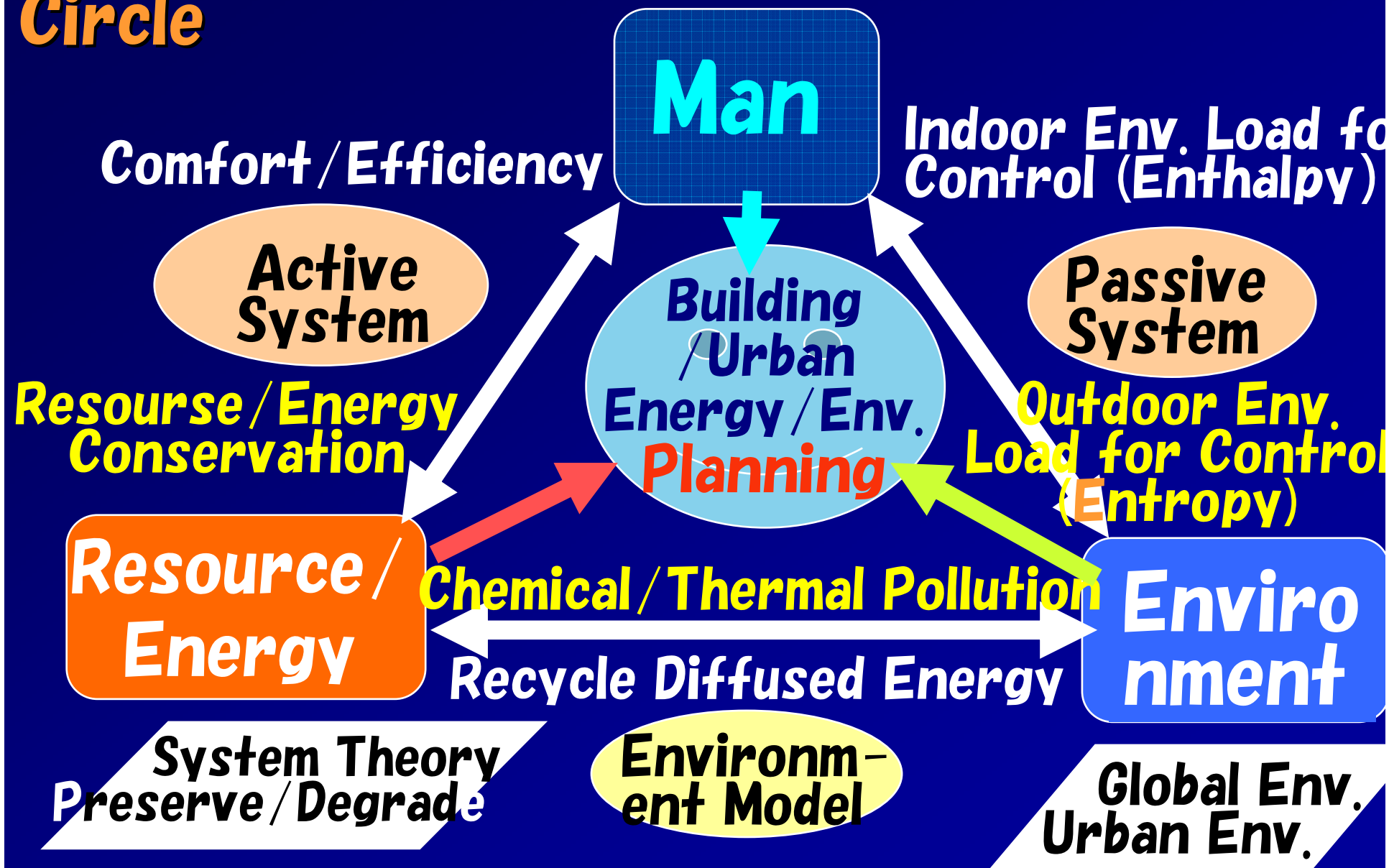
Environment

Recycle Diffused Energy

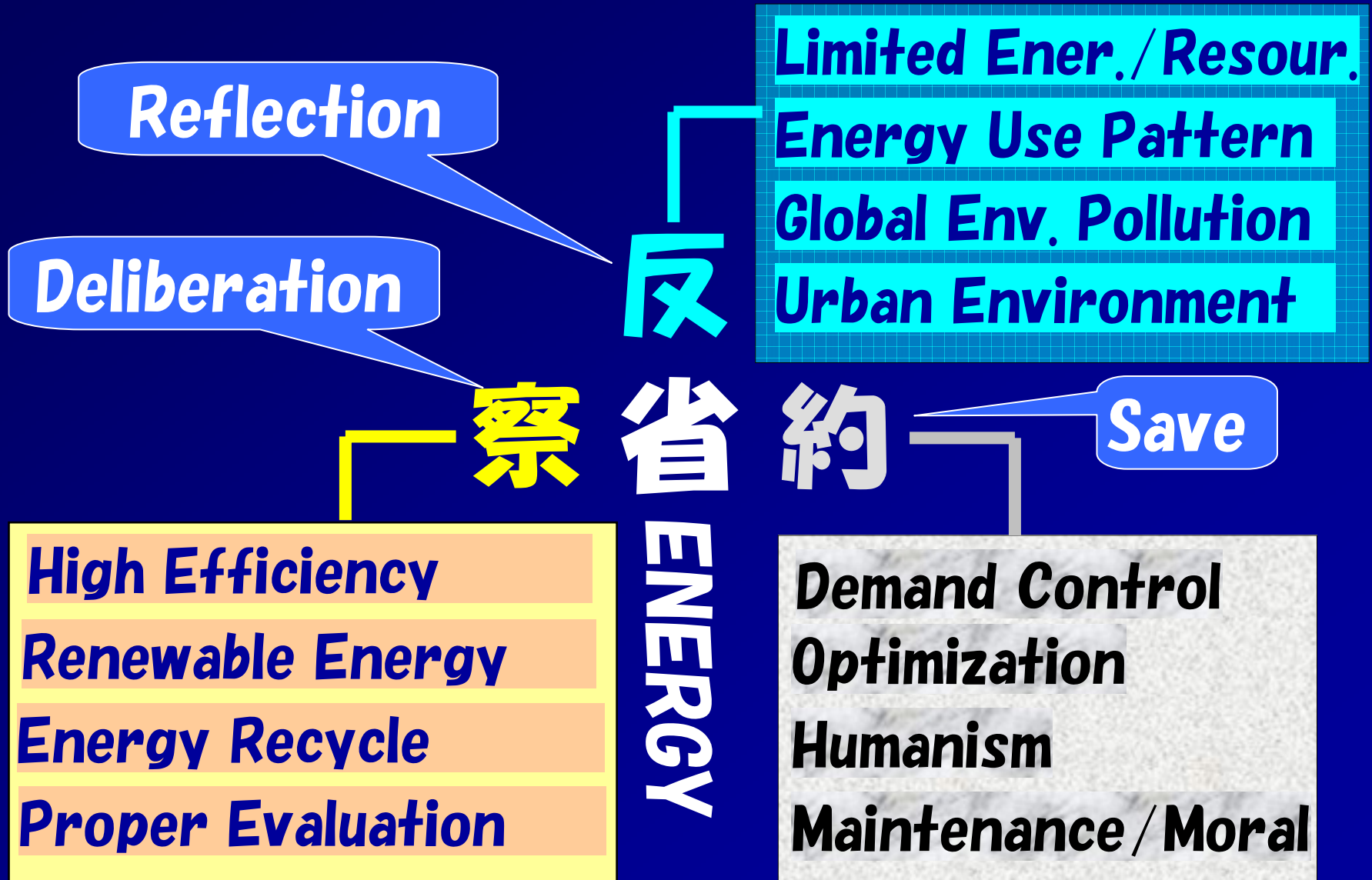
System Theory
Preserve / Degrade

Environment Model

Global Env.
Urban Env.



Energy Conservation Principle



Commissioning Application

- **Life Cycle Commissioning**
- **Initial Commissioning**
 - **Total Initial Commissioning)**
 - **Partial Initial Commissioning)**
 - **Ex1 : Acceptance Step Commissioning**
 - **Ex2 : Program Phase Commissioning (Consulting)**
 - **Ex3: Construction Phase Commissioning**
- **Retro Commissioning**
- **Continuous Commissioning**

What is Commissioning (Cx) ?

– – **process definition**

- **the process to accomplish the real Owner's Project Requirements through building construction stage and continuing to operation and maintenance stage as the life-cycle process**

– – **global definition**

- **Commissioning is performed in order to keep the system in optimal condition through the life of the building from the viewpoints of environment, energy and facility usage**

Who manages Cx Process?

Commissioning Authority (CA)

CA shall be

- **nominated and paid directly by owner,**
- **individuals or organizations which are socially acknowledged as a bearer of fair mind with sufficient professional knowledge and management capability,**
- **the third personality concerning the project in concern**
- **preferably, standing-alone professional independent from design team and construction team**

Commissioning phases

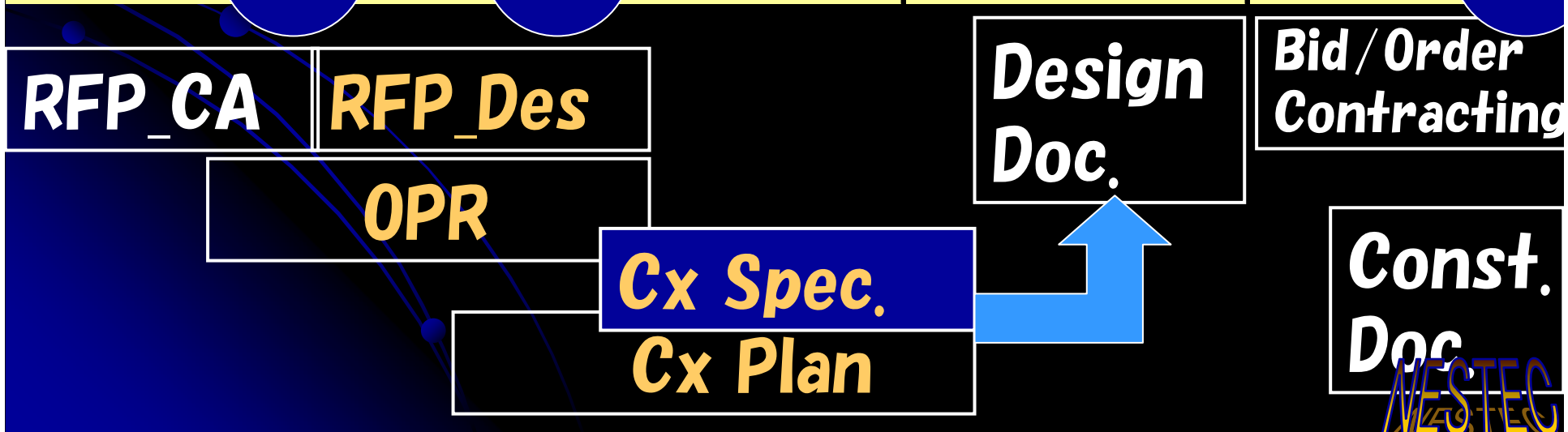
Production Stage

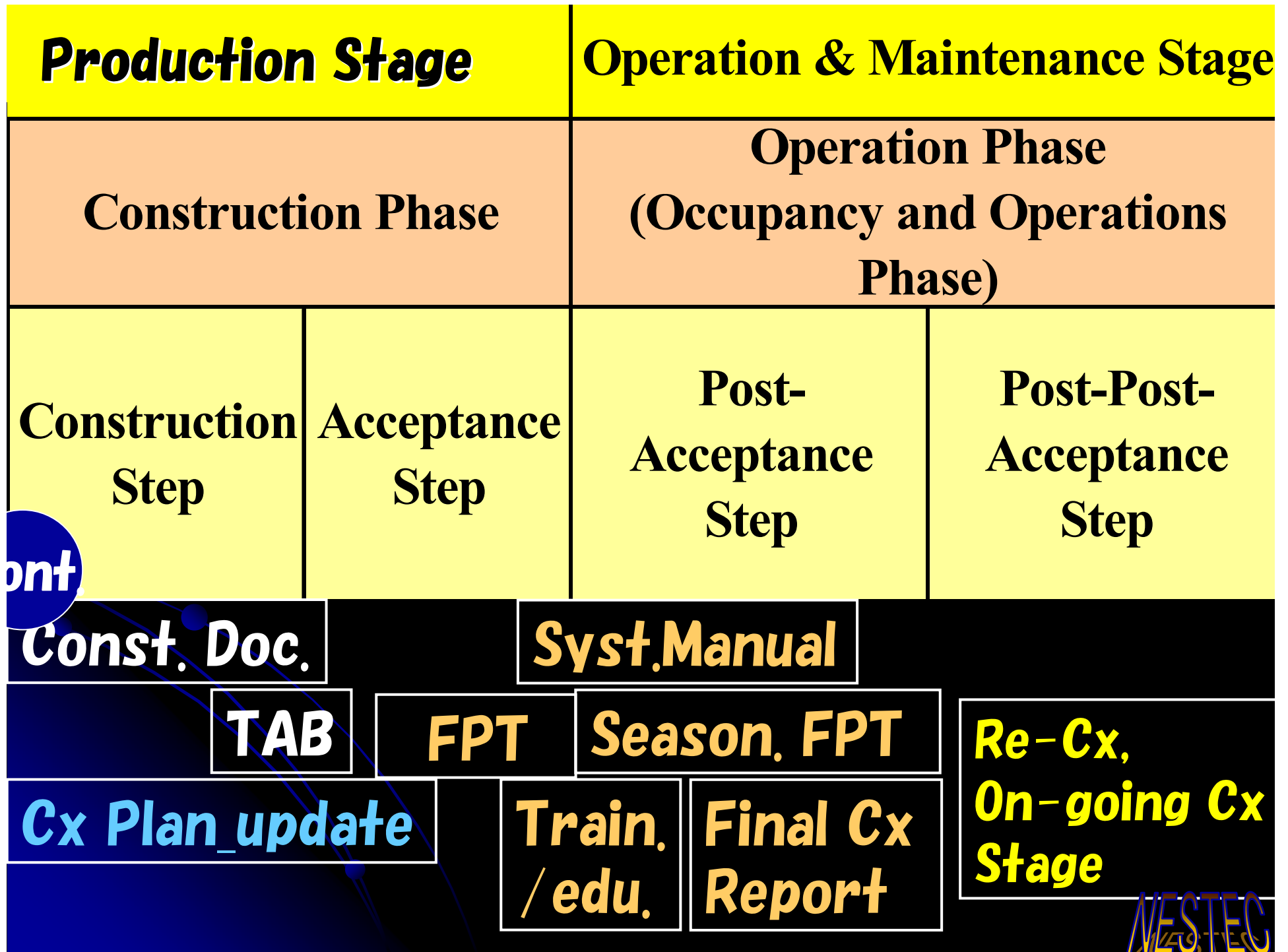
Program Phase (Pre-Design Phase)		Design Phase		Elabolation Phase
Program Step	Planning Step	Preliminary Design Step	Working Design Step	Elabolation Step

CA

Des.

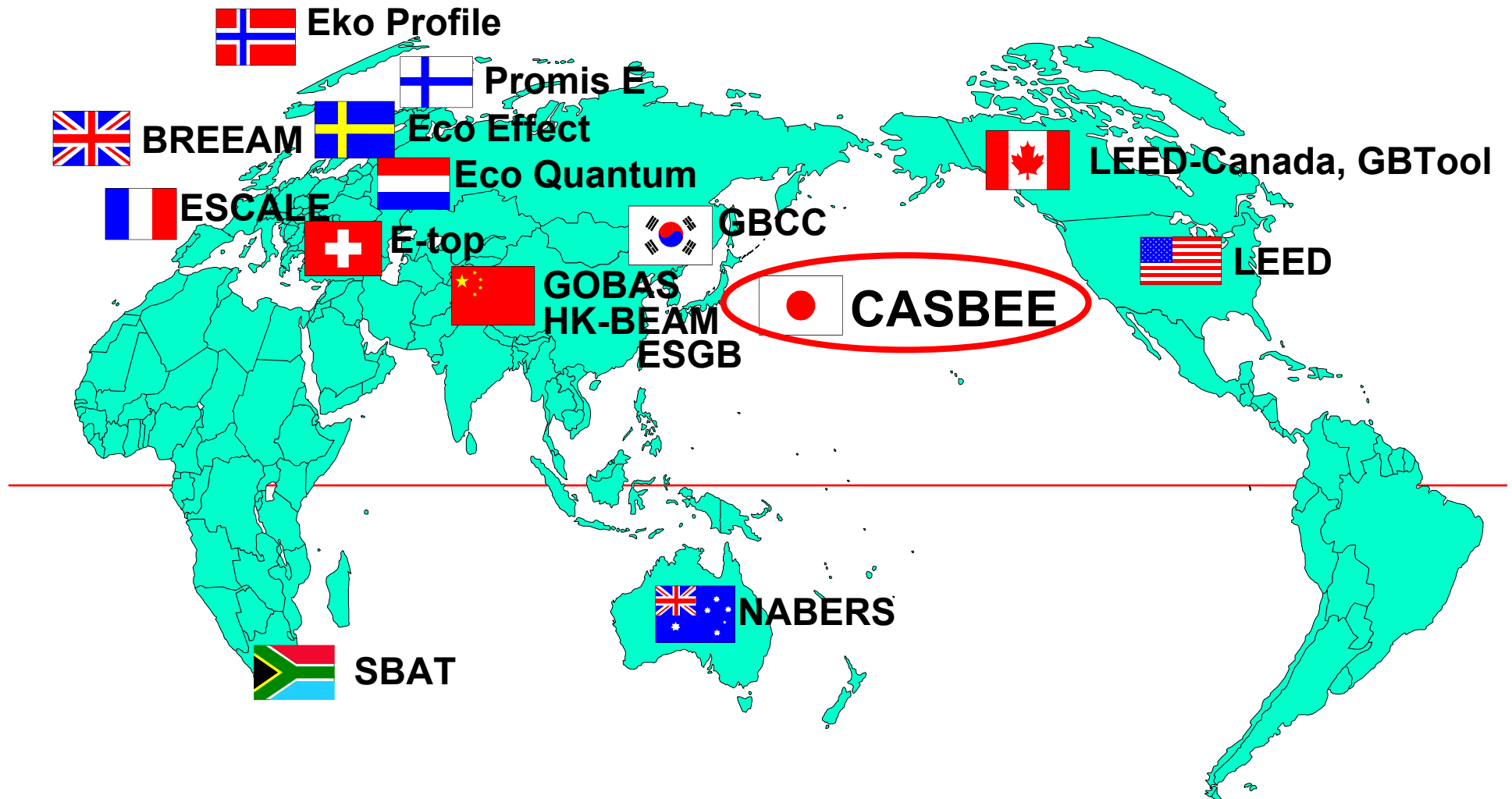
Con





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Evaluation System of Sustainable Building



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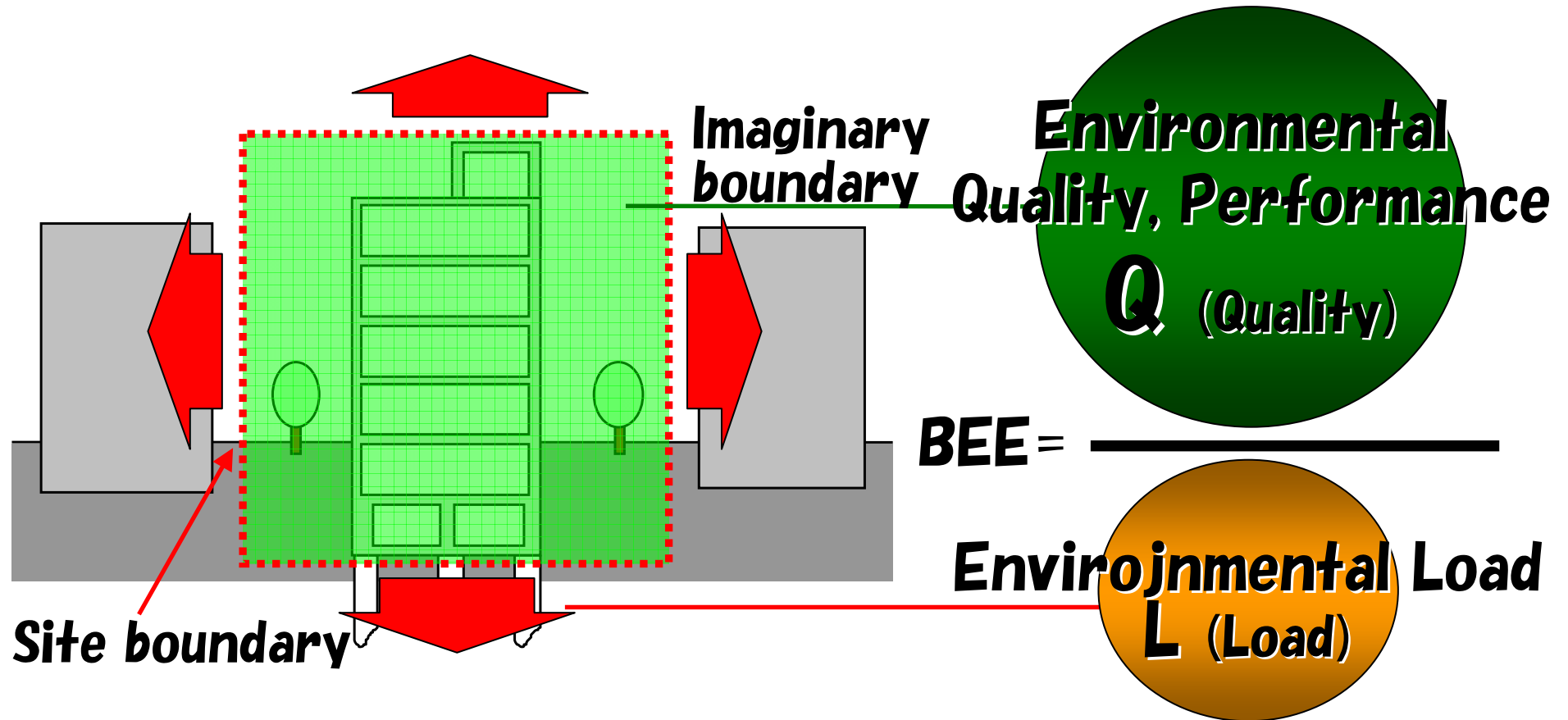


LEED-NC 2.2 Prerequisite 1: **Fundamental Cx of Building Energy Systems**

- **Designate an individual as the Commissioning Authority (CxA) to lead, review and oversee the completion of the commissioning process activities.**
- **The Owner shall document the Owner's Project Requirements (OPR)**
- **Develop and incorporate commissioning requirements into the construction documents.**
- **Develop and implement a commissioning plan.**
- **Verify the installation and performance of the systems to be commissioned.**
- **Complete a summary commissioning**

CASBEE (Japan)

Comprehensive **A**ssessment **S**ystem for
Building **E**nvironmental **E**fficiency



Realize Buildings with better Q&P emitting less Environmental Load \Rightarrow **BEE (Building Eco Efficiency)**

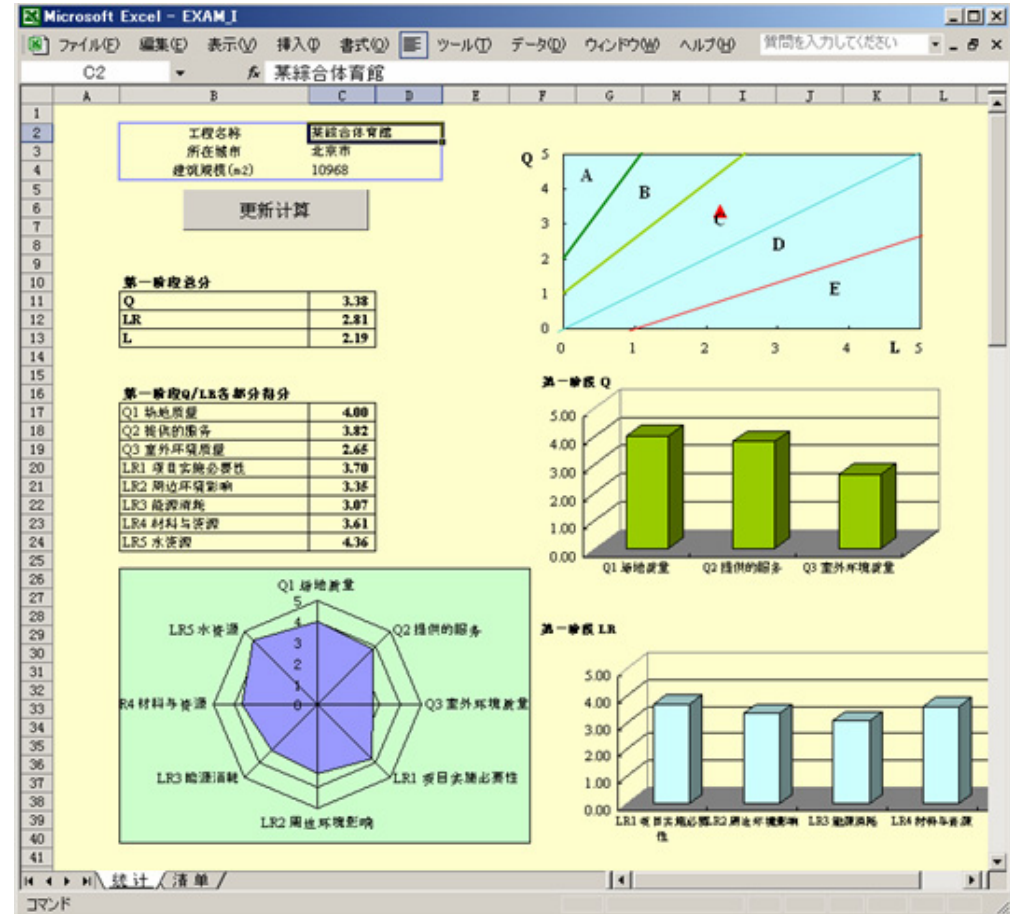
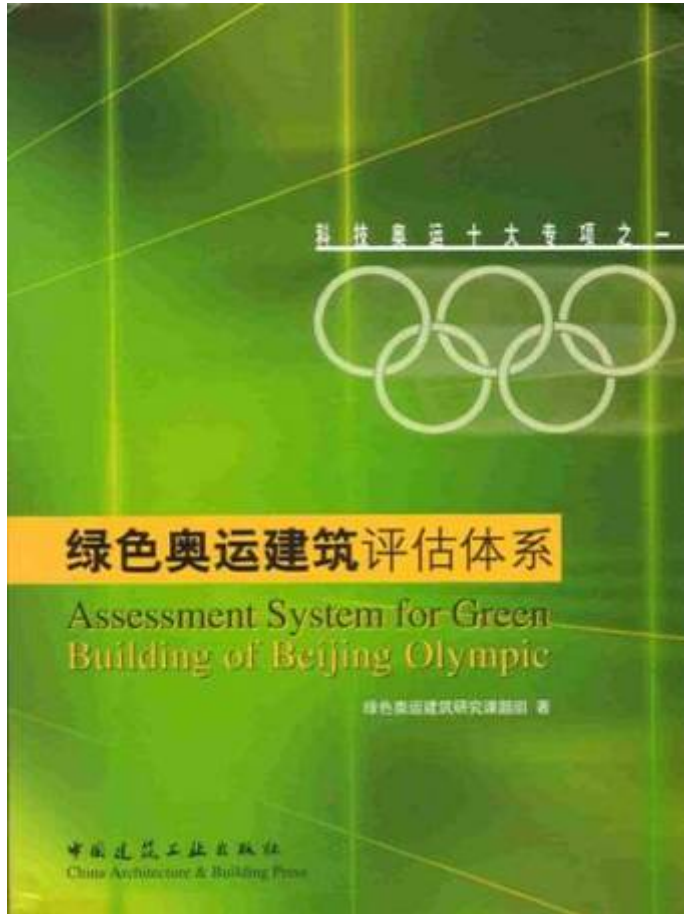


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GOBAS (China)

(For 2008 Beijing Olympic Facilities, 2003.8)
(CASBEE was referred)



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Merit of Commissioning

For Building Owners:

- Building truly match Owner's requirements
- Realize High Quality Products and Maintenance
- Contribution to Facility Management
- Obtain Cost Efficient Building through Lifecycle
- Satisfactory Room Environment
- Added Value to Real-estate
- Reasonable rent
- Satisfaction through Energy Conservation and Contribution to Global Environment

Merit of Commissioning

For Design Professionals:

- **Raises Quality of Design**
- **Clarify Roles and Responsibility of Designers**
- **Economical Merit**
 - **Fair amount of fee deserving its quality**
 - **Reduced Troubles**
 - **Cost Effective Design**
- **Raised Fame as Design Professional**
- **Act as CA based on their experience**

Merit of Commissioning

For Contractors:

- Clarify Scope of TAB
- Reduce Troubles during Construction and after Occupancy
- Economical Merit
 - Clarified Scope and Responsibility for TAB and Cx-related Works
 - Reduce Risks for Trouble Solution Expense
 - Clearly define Fee for Design Support Works
- Clearly define Acceptance Procedure
- Act as CA based on their experience

Merit of Commissioning

For O&M Engineers:

- Earlier Participation to Cox Team Process
- Improved Maintainability
- Improved System Documentation to Operate
- High Quality Accepted Systems through Complete TAB, FPT process
- Acceptability to Instruction and Guidance by CA as Consultant
- Improved Status of O&M assisted by Deepened Knowledge and Improved Working Environment

World Commissioning History World / Asia Asia



- **1970s Cx Activ. started, USA**
 - CIBSE Code on Cx
- **1979 ASHRAE Symp. on TAB**
- **1986 ASHRAE Symp. On Cx.**
- **1988 First SIBSE Code in UK**
- **1989 First AHRAE Cx Guide**
- **1991 Annex25, B0FD**
- **1993 First NCBC held, PECl**
- **1995 Annex34, B0FD Demo**
- **1996 ASHRAE New Cx Guide**
- **1999 BCA (US) established**
- **2000 Annex40, HVAC Cx**
- **2003 UK Cx Code M issued**
- **2005 ASHRAE/NIBS Cx Process**
 - 200X-0 issued
 - Annex47, Retro-Cx, etc**
- **2006 ICEBO 2006 (Shenzhen)**
- **1980s (HK) TAB / Cx Activity started**
- **1987 (J), First introduction of Cx**
- **1991 (J,C) Annex25**
- **1995 (J,HK) Annex34**
- **1997 (J) Cx Activity started**
- **1998 (J) First Cx Guide Draft**
- **2000 (J,HK) Annex40 participation**
 - (J) **First Application of ICx**
- **2003 (TW) TAB / Cx began to work**
- **2004 (J) BSCA established**
 - (HK) **HKBCxC established**
- **2005 (J) Cx Guideline issued**
- **2006 APCBC 2006.11 (Shenzhen)**
 - (TW) **Cx Guideline (to be issued)**



**Thank you
for your participation**