

The Structure of Life-cycle Commissioning Process

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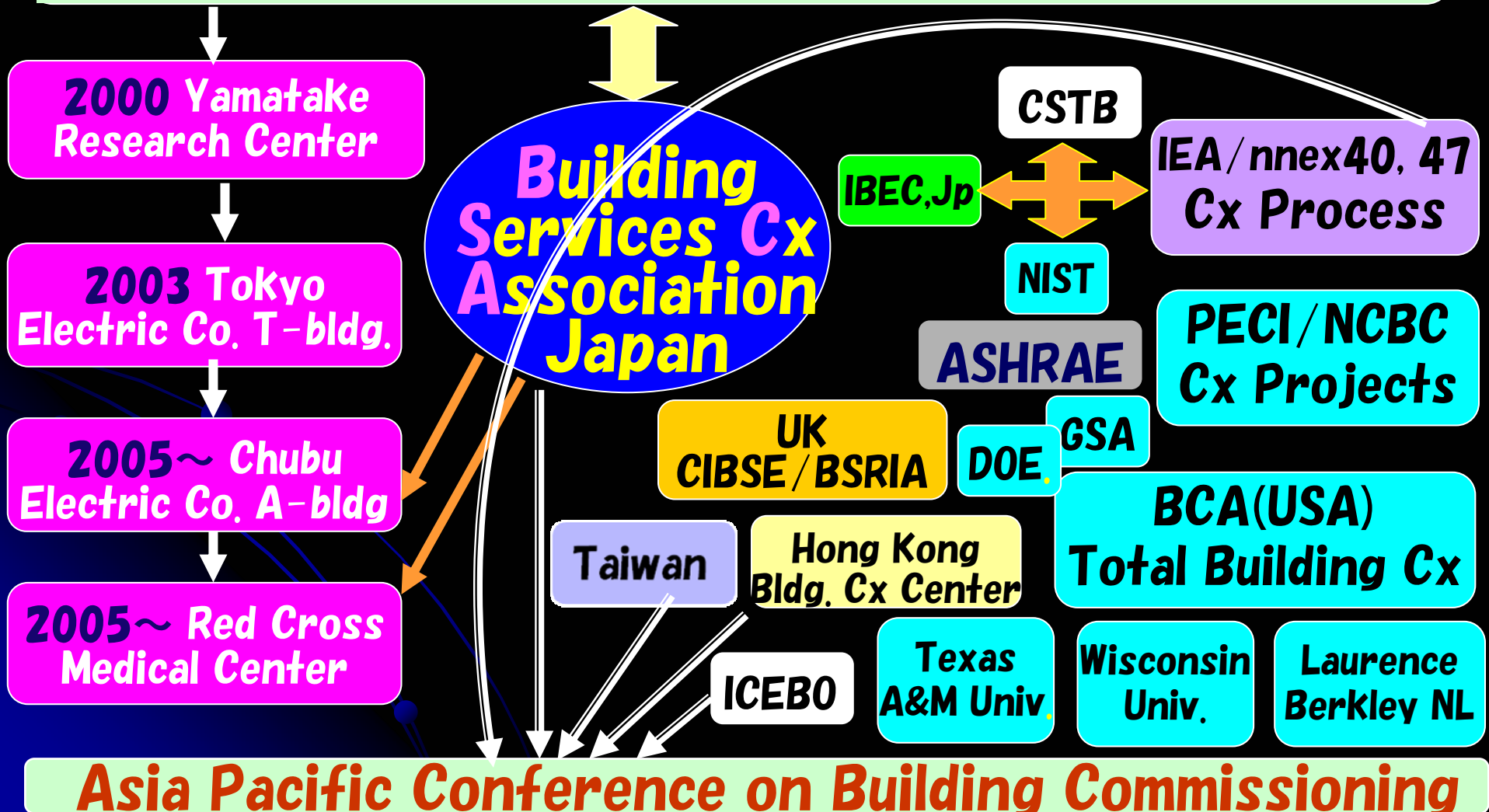
Presentation

- **Commissioning Activities in the world**
- **APCBC, the footprint**
- **Commissioning Process and Terminology**
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Commissioning Map, Japan and World

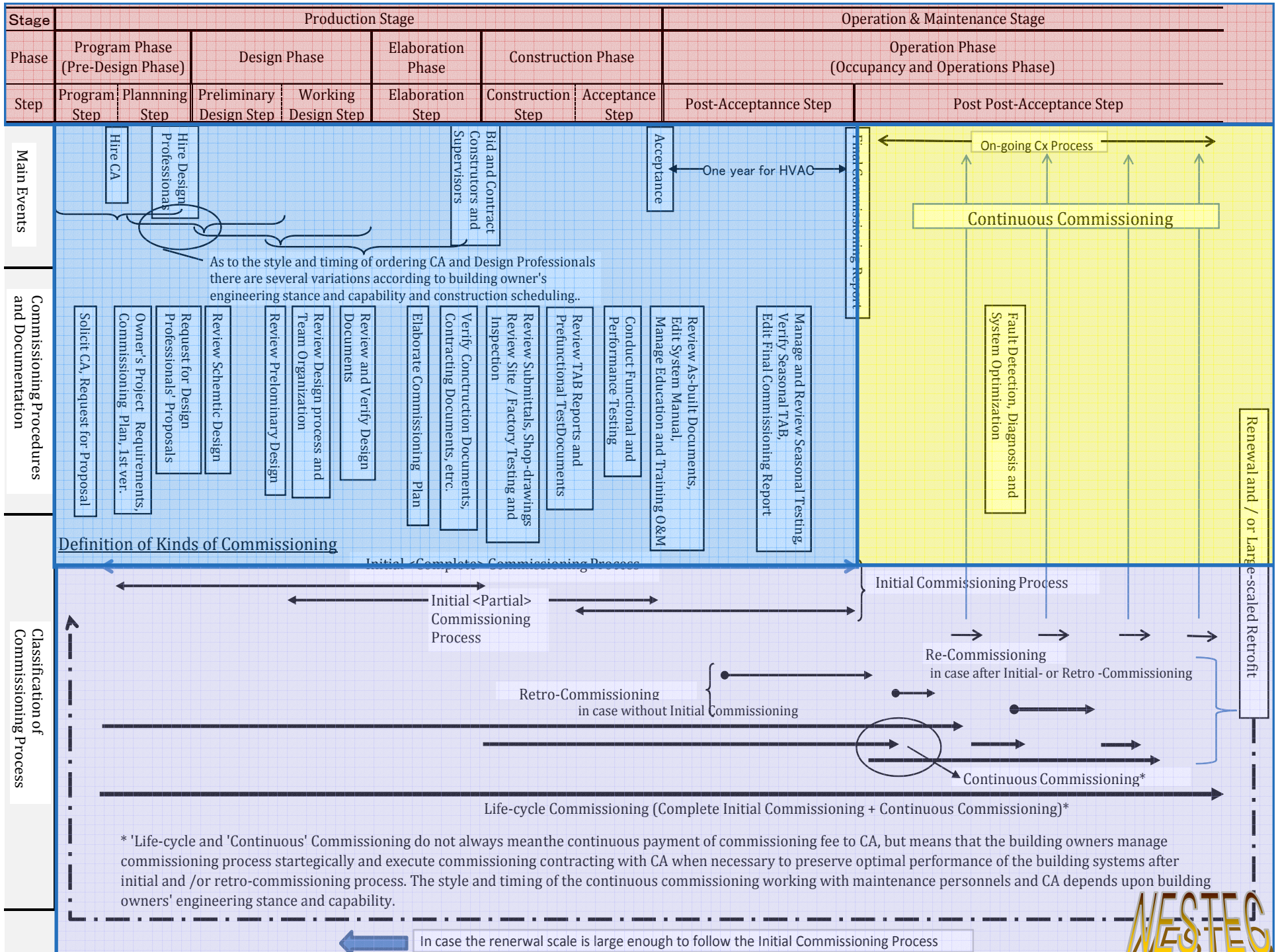
SHASE

BEMS Committee → Commissioning Committee



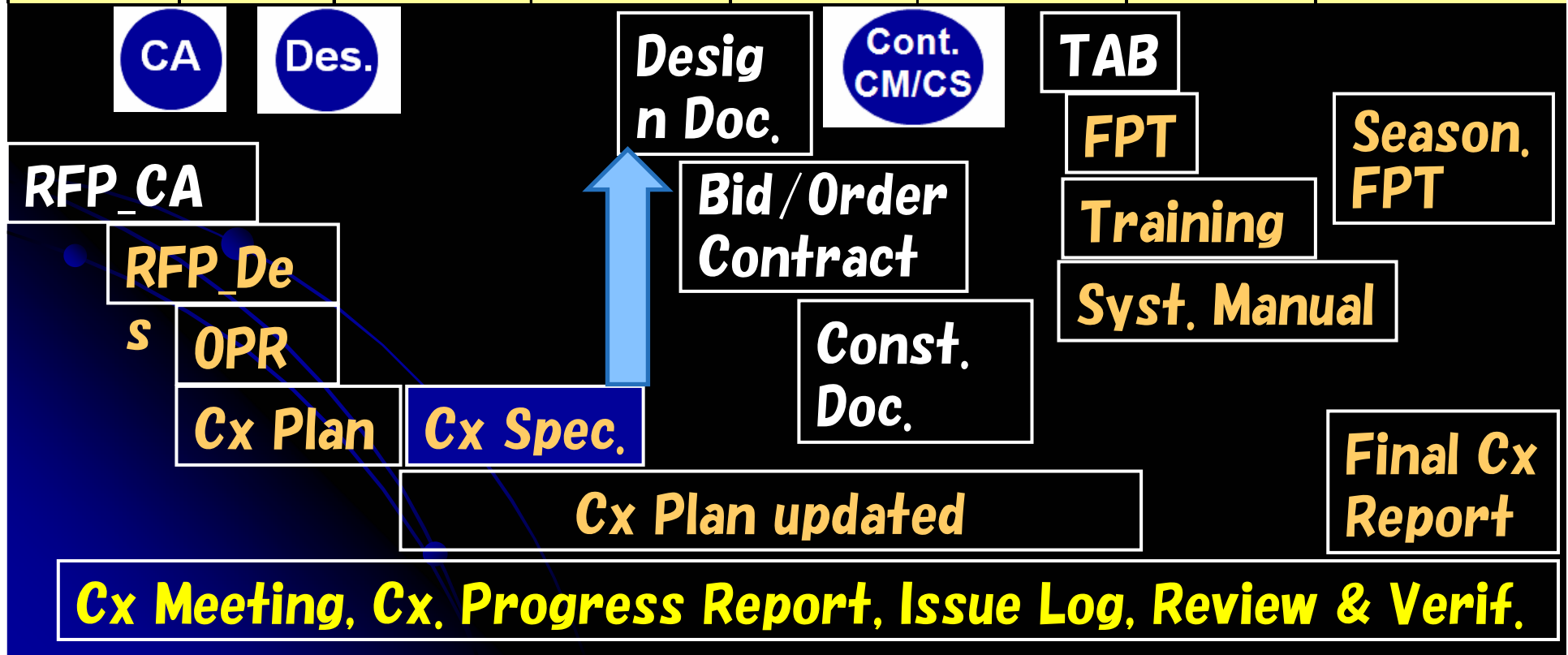
Progress of APCBC

- **August 2002: Mr. Wong (HK) visited Nakahara (Japan) for cooperative relation on Building Commissioning (Nagoya)**
- **April 2003: International Short Symposium on HVAC Commissioning / Annex 40 Kyoto meeting (Kyoto)**
- **October 2003, ISHVAC-03, Tsinghua U. (Beijing)**
 - Study and Practice on HVAC System Commissioning, NN
- **October 2004: ICEBO-04 / Annex40 (Paris)**
 - JAPANESE VISION OF COMMISSIONING PROCESS AND ASIAN VIEW, NN
- **April 2006, NCBC-06 (San Francisco)**
 - Promoting Commissioning Process in Japan, Nakahara
- **November 2006, #1 APCBC-06 / ICEBO-06 / Annex47**
- **May 2007, NCBC-07 (Chicago)**
 - Overview on Activity of Building Commissioning in Asia and Japan, Shimazu and NN
- **October 2007, #2 APCBC-07 (Workshop) / Annex47, Kyoto**
- **November 2008, #3 APCBC-08, Hong Kong**



Commissioning Process for New Construction

Production Stage							Operation Stage
Program Phase (Pre-Design Phase)		Design Phase		Elabolation Phase	Construction Phase		(Occupancy & Operation Phase)
Program Step	Planning Step	Preliminary Design Step	Working Design Step	Elabolation Step	Construction Step	Acceptance Step	Post-Acceptance Step



Continuous Commissioning Process (ASHRAE 0-2005)

- **Continuous Commissioning Process: A continuation of the Commissioning Process well into the Occupancy and Operations Phase to verify that a project continues to meet current and evolving Owner's Project Requirements. Continuous Commissioning Process activities are on-going for the life of the facility**

On-Going Commissioning Process

- **On-Going Commissioning Process: A continuation of the Commissioning Process well into the Occupancy and Operations Phase to verify that a project continues to meet current and evolving Owner's Project Requirements. On-Going Commissioning Process activities occur throughout the life of the facility; some of these will be close to continuous in implementation, and others will be either scheduled or un-scheduled (as needed)**

- **Continuous Commissioning Process activities are on-going for the life of the facility**
- **On-Going Commissioning Process activities occur throughout the life of the facility; some of these will be close to continuous in implementation, and others will be either scheduled or un-scheduled (as needed)**

Re-Commissioning

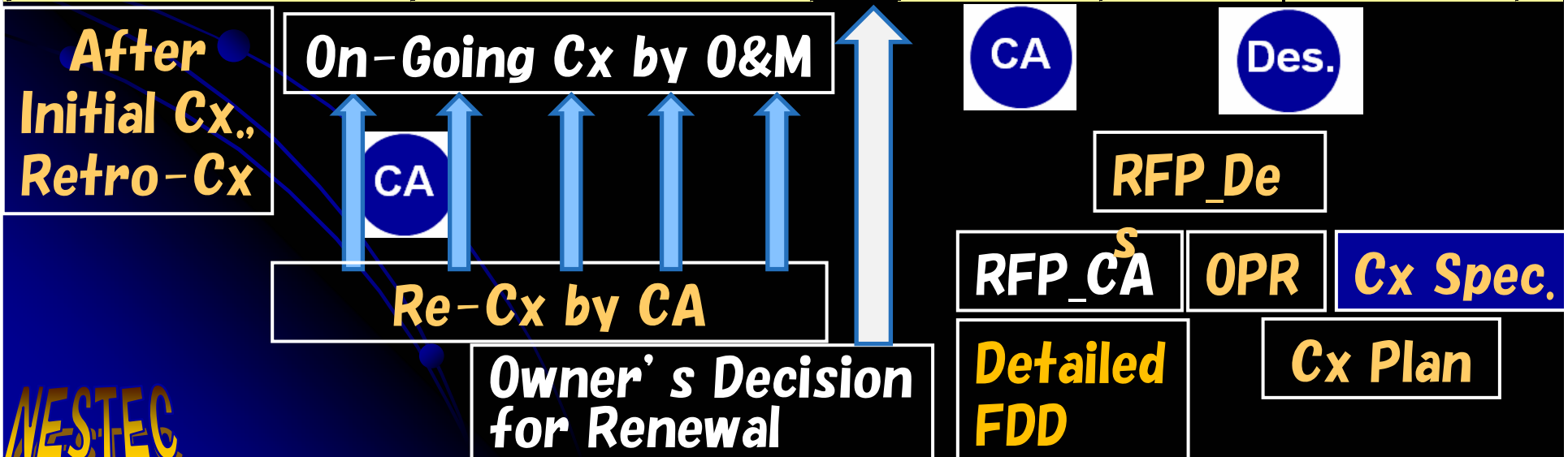
- **Re-Commissioning: An application of the Commissioning Process requirements to a project that has been delivered using the Commissioning Process. This may be a scheduled re-commissioning developed as part of an On-Going Commissioning Process, or it may be triggered by use change, operations problems, or other needs.**

Continuous Commissioning for Existing Buildings

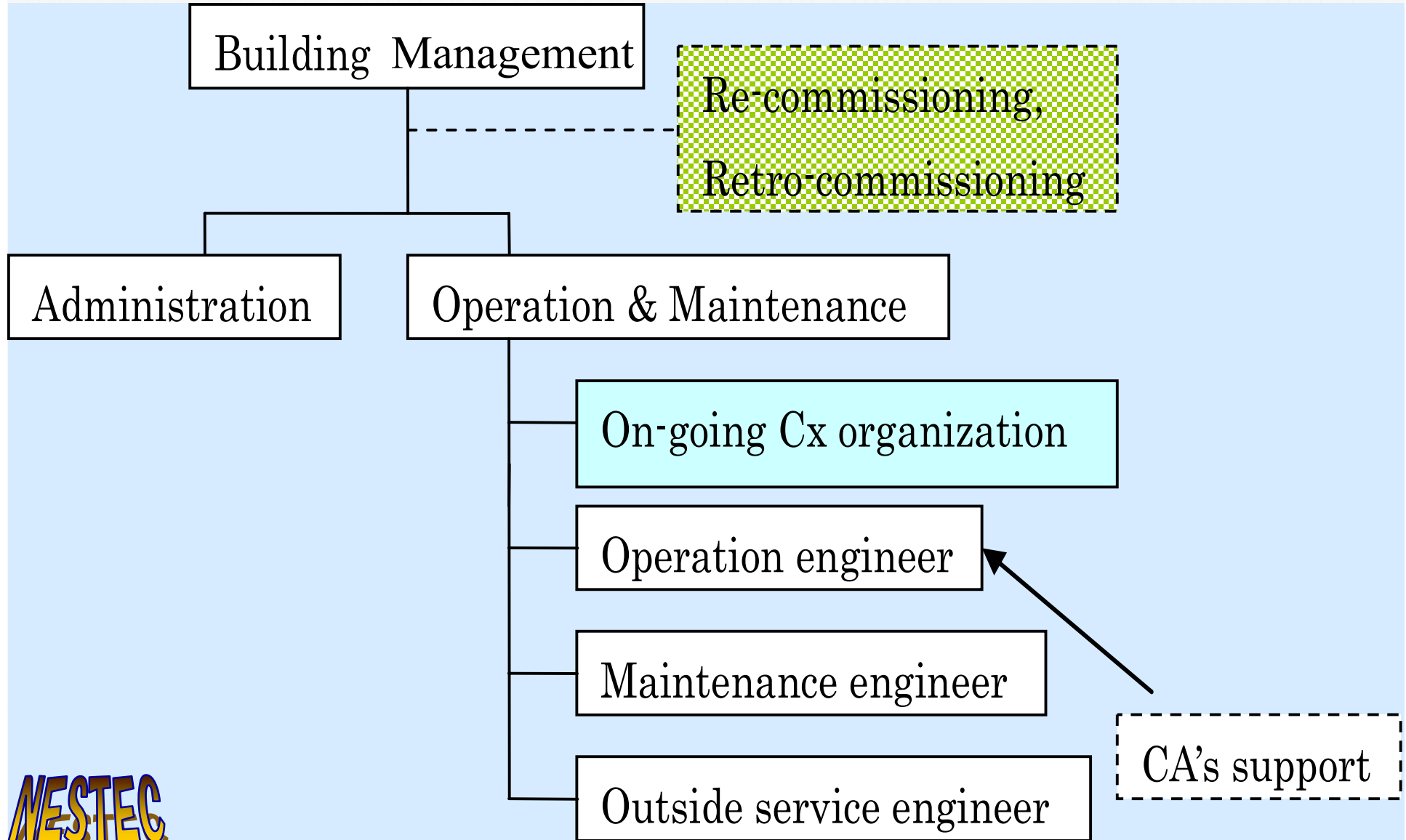
Follow Initial Cx Process

Renewal Process

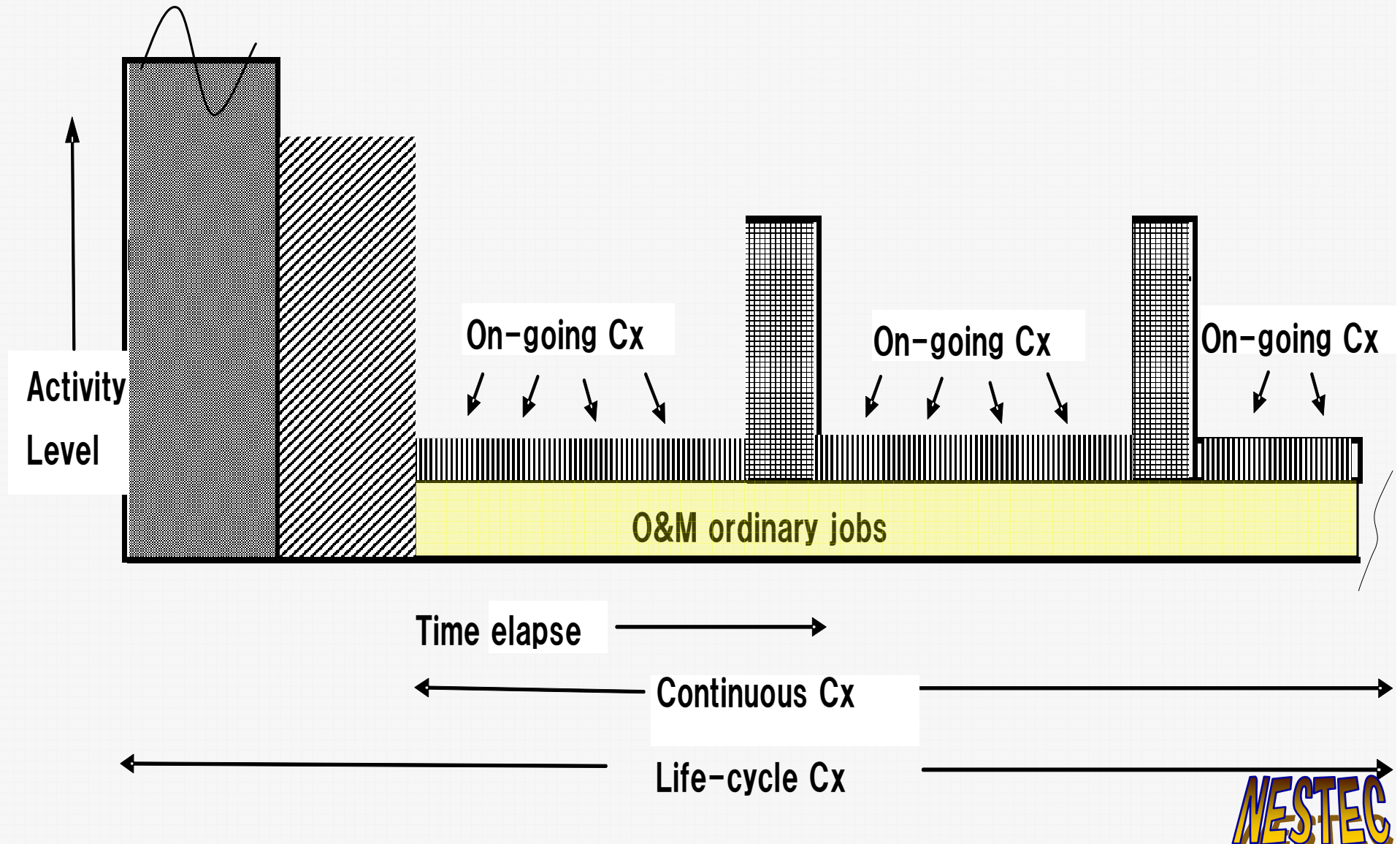
Operation and Maintenance Stage		Program Phase (Pre-Design Phase)			
(Occupancy & Operation Phase)		Program Phase (Pre-Design Phase)		Design Phase	
Post-Acceptance Step	Post-Post-Acceptance Step	Program Step	Planning Step	Preliminary Design Step	Design Step



O&M's Organization for Building Services Systems



Relation among Commission Types and Structure of Continuous Cx



On-going Commissioning Process Phases

Preparation Phase

Acceptance of documents on TAB and FPT reports, system manual and special notice from foregoing Cx process

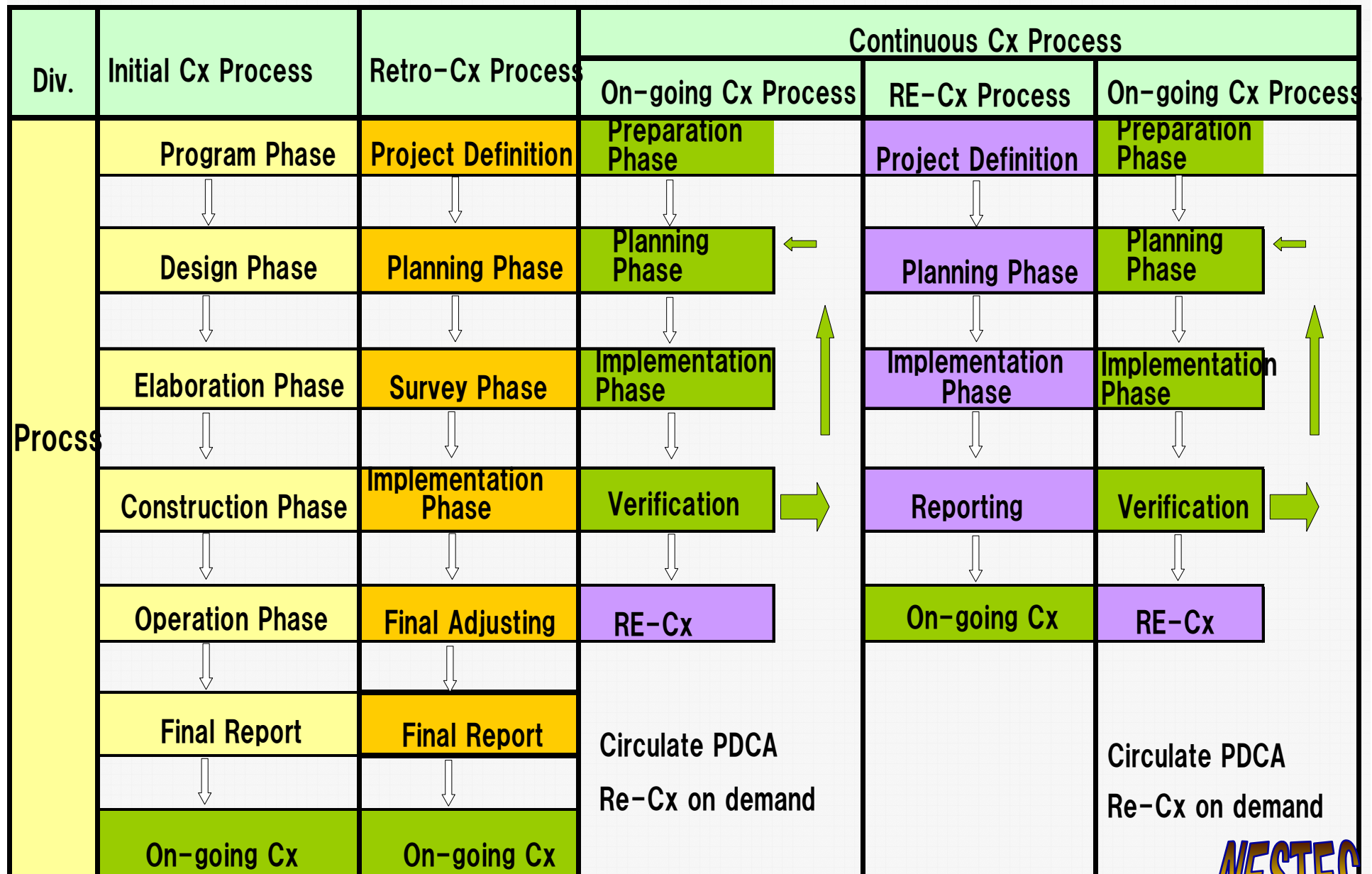
Planning phase

Goal of the Performance index, Method of data acquisition and analysis, Cx organization

Implementation Phase

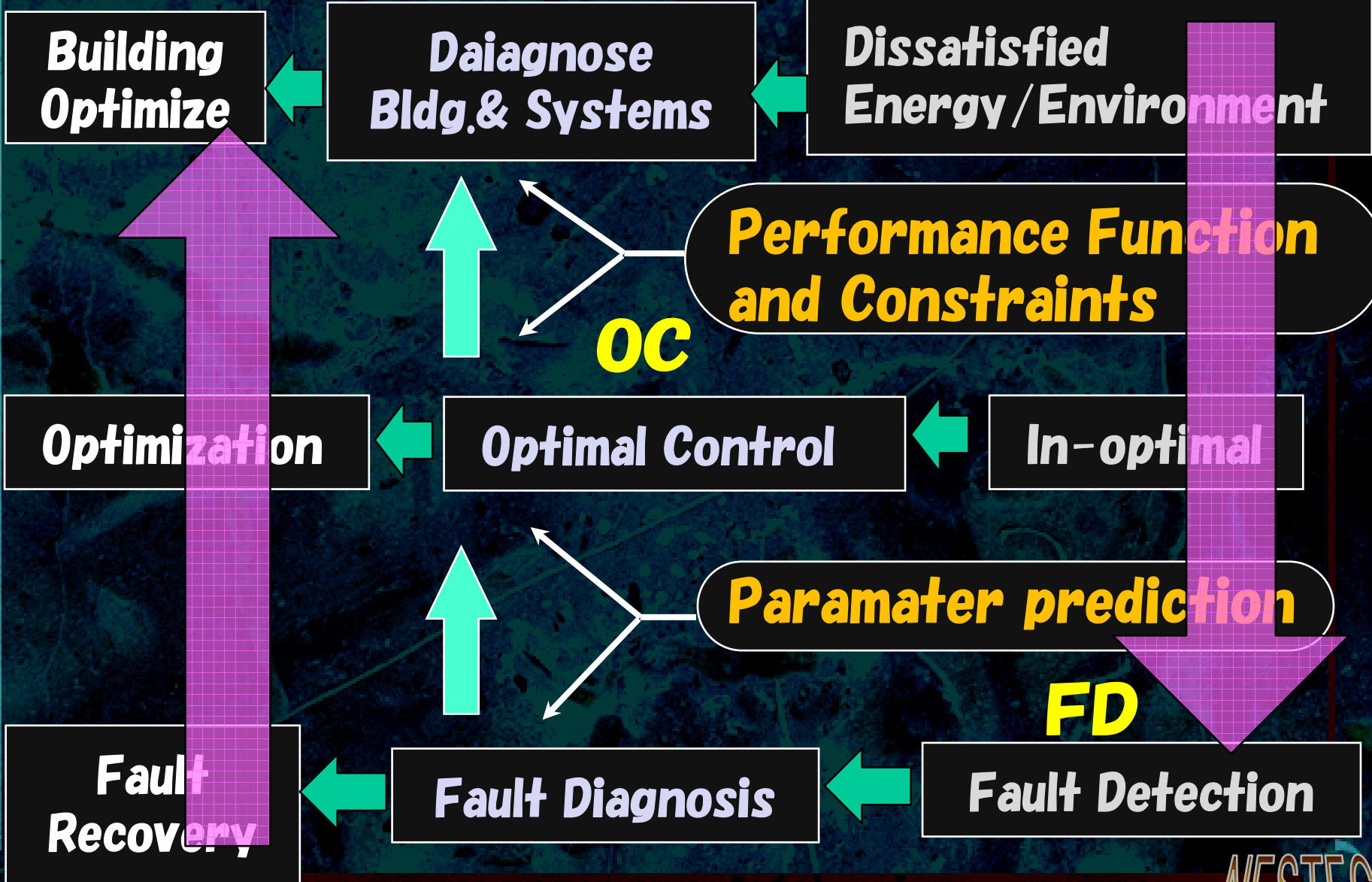
O&M activities, Monitoring and data analysis, Verification of the analyzed results, Check performance, Report to owner, Fault detection, diagnosis and recovery

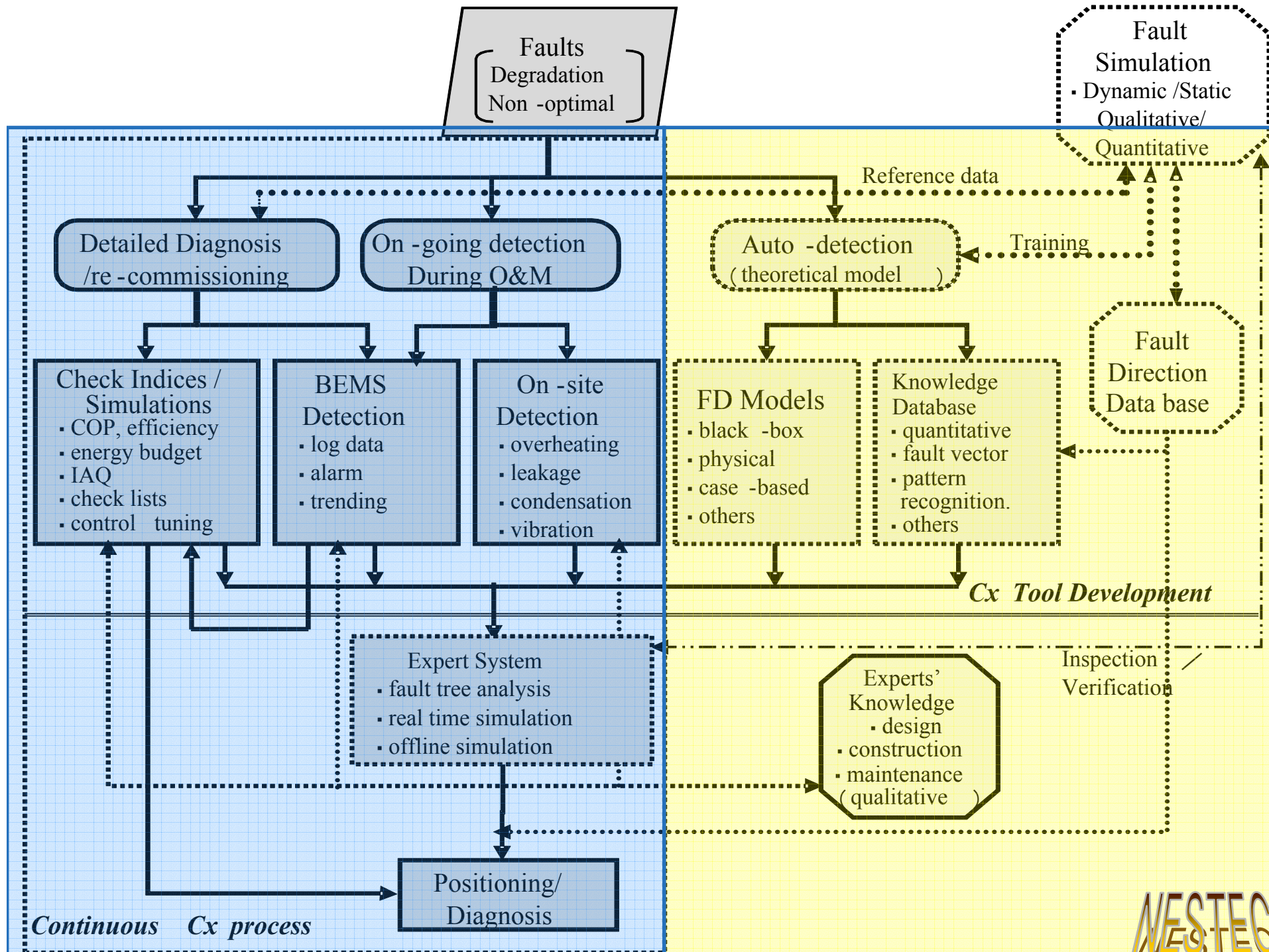
Life-cycle Commissioning



BOFDD

BO





Conclusions

- **Continuous Cx is newly defined as the combination of on-going Cx and re-Cx, supplementing each other with close data exchange through commissioning reports.**
- **On-going Cx is defined as O&M's activity**
- **Re-Cx was defined as on-demand Cx by CA.**
- **The new definition will give O&M staff a strong motivation for their jobs in contribution to energy saving and global environment, but with fair payment.**
- **However, initial Cx to be followed by continuous Cx, which constitutes life-cycle Cx, is most desirable to achieve the global goal for energy conservation.**

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 Cx

Resource / Energy Conservation

Outdoor Env. Load for Control (Entropy)

Resource / Energy

Chemical / Thermal Pollution

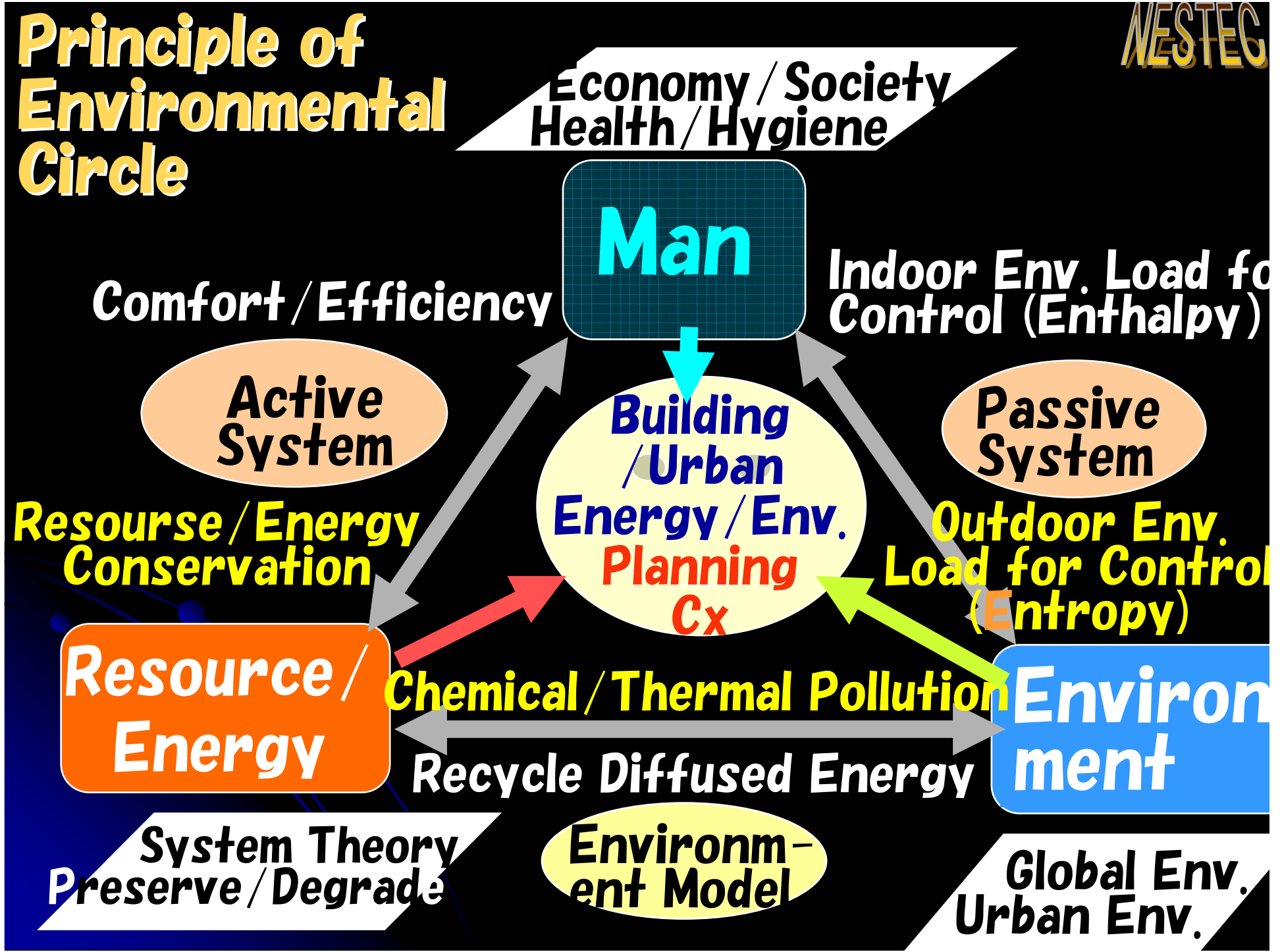
Environment

Recycle Diffused Energy

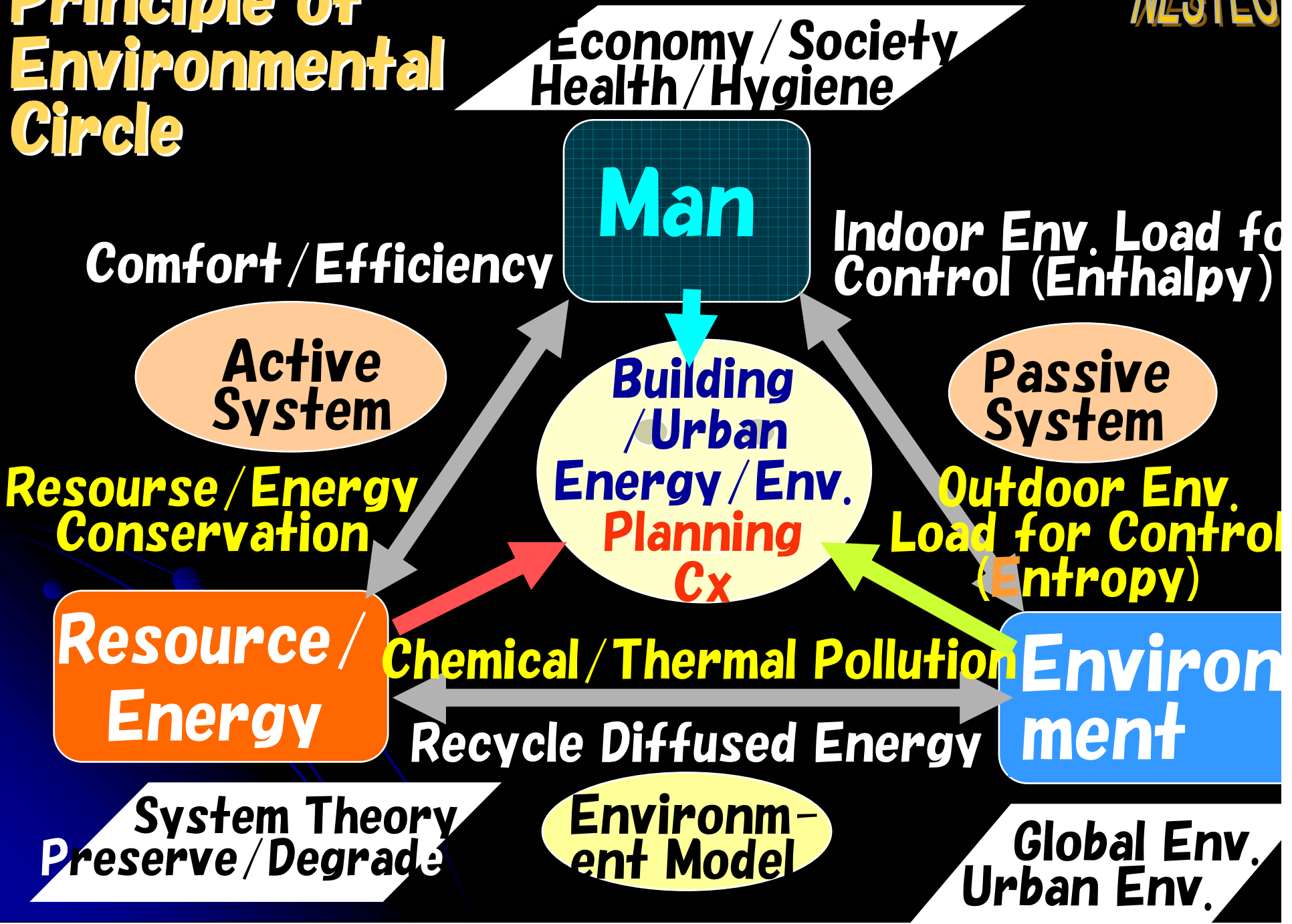
System Theory
Preserve / Degrade

Environment Model

Global Env. Urban Env.



Principle of Environmental Circle



**Thank you
for your kind attention!**

See you at the Fourth meeting.

