



# Green Schools 2.0

## for Retro-commissioning

Induction Talk for Operation Level



# AGENDA

- 1 Hong Kong Development Planning
- 2 Difficulties and Issues of Energy Management in Building Operation
- 3 Retro-commissioning (RCx) Advantages
- 4 Retro-commissioning (RCx) Considerations
  - a. Investment
  - b. Competence
  - c. Technology Transformation
- 5 Achievement for the Campus/Buildings
- 6 Conclusion





## Hong Kong Development Planning





2030 Carbon Reduction Target

**DEEPENING  
ENERGY SAVING IN  
EXISTING BUILDINGS**  
IN HONG KONG  
THROUGH '4Ts' PARTNERSHIP



Operational Model (Existing  
Bldgs.)

## 2030+ HK's Climate Action Plan

- ☐ Timeline
- ☐ Target
- ☐ Transparency
- ☐ Together



**Coherent with Paris Agreement in Nov 2016**

# 4Ts partnership between Government and Building Sector



Source: DEEPENING ENERGY SAVING IN EXISTING BUILDINGS IN HONG KONG THROUGH ‘4Ts’ PARTNERSHIP





## **Difficulties and Issues of Energy Management in Building Operation**



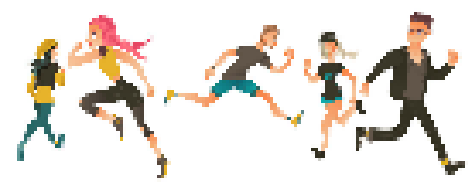
# Vision and Mission of the Facility Management

## Challenges:

Aging of the  
equipment

Professionalism of  
practitioners

Innovation & rapid change  
of technology



2050

## Conventional

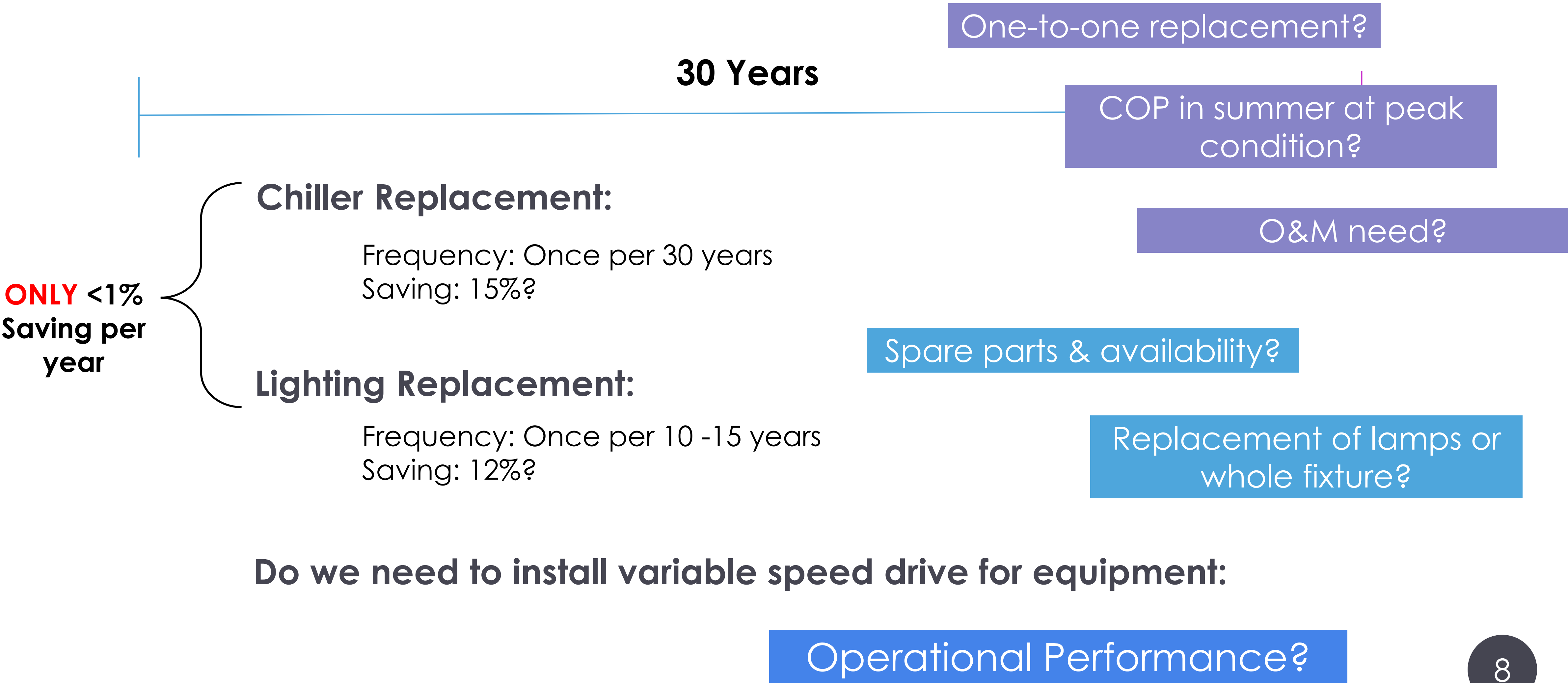
How to meet the TARGET in the TIMELINE??

Lighting  
Replacement ?

Chiller  
Replacement ?

Variable Speed  
Drive Installation ?

# Meeting Target in the Timeline



Do we need to install variable speed drive for equipment:





## Retro-commissioning (RCx) Advantages

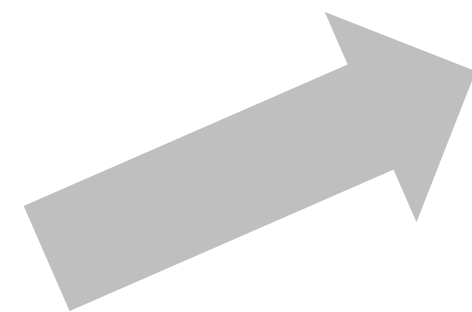
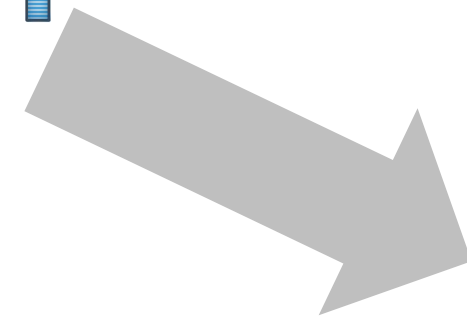
3



# Advantage of Retro-commissioning (RCx)

## Operation Performance

TARGET



TIMELINE

Maintain & Operate  
low carbon,  
sustainable and  
healthy building  
(competences)



Environment

Energy Reduction

Staff

Money

Building Your  
Capacity

Value for  
money



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## Retro-commissioning (RCx) Considerations

4



# Considerations of Retro-commissioning (RCx)

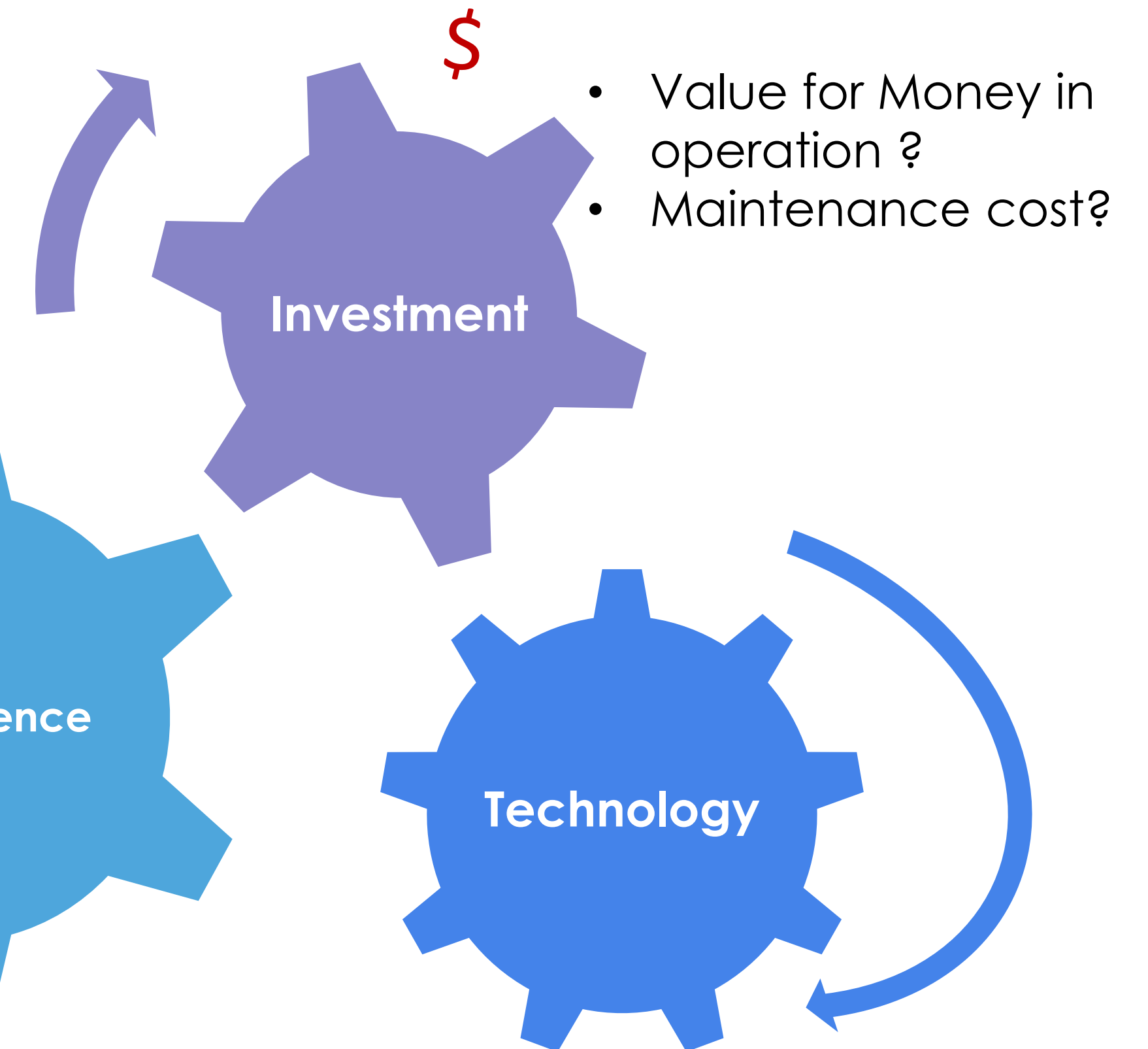
Retrofit (replacement)  
Retro-commissioning

.....



How to assess  
performance?

- Skills & knowledge needed?
- In-house / Outsourcing?

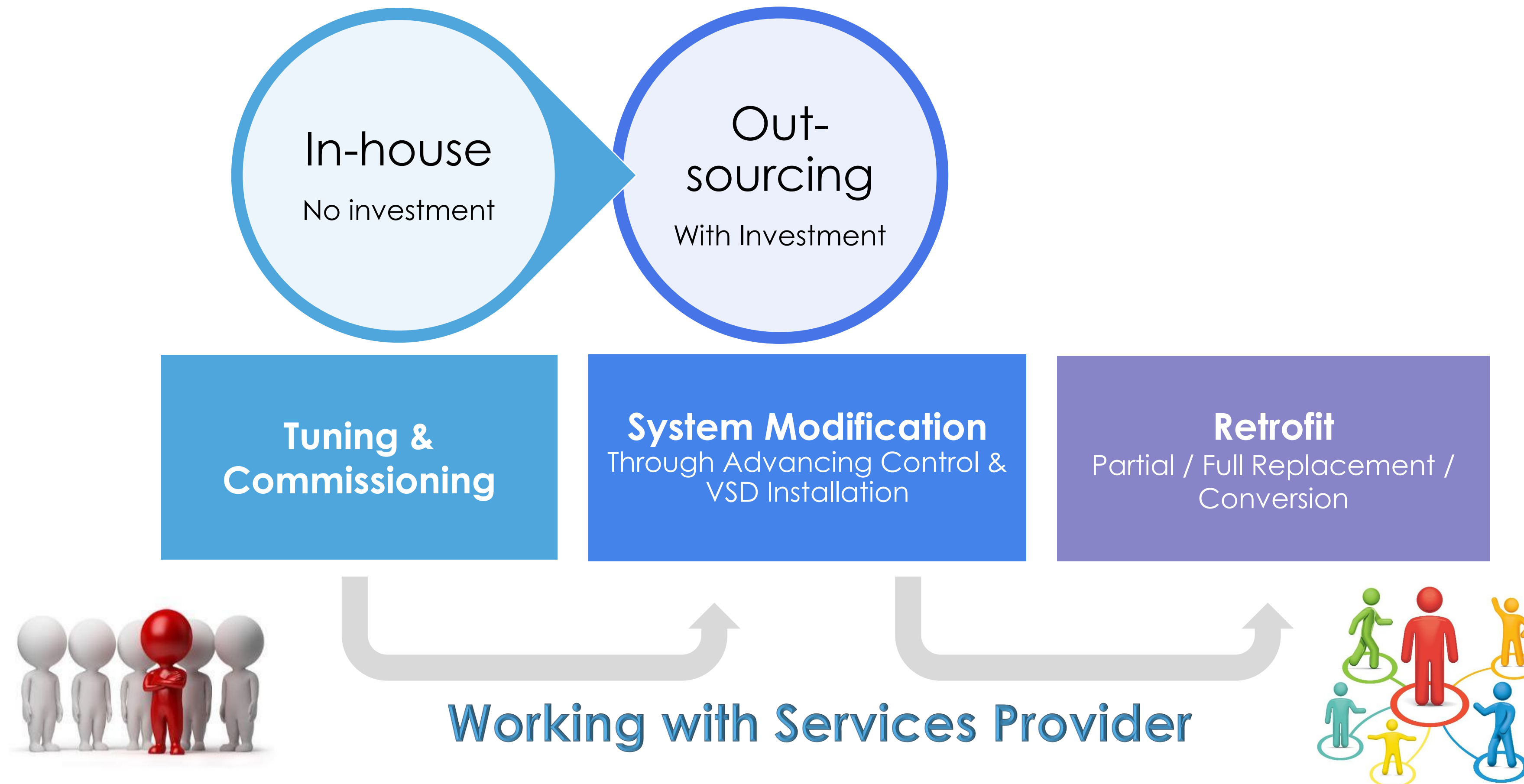


Adapt transformation?



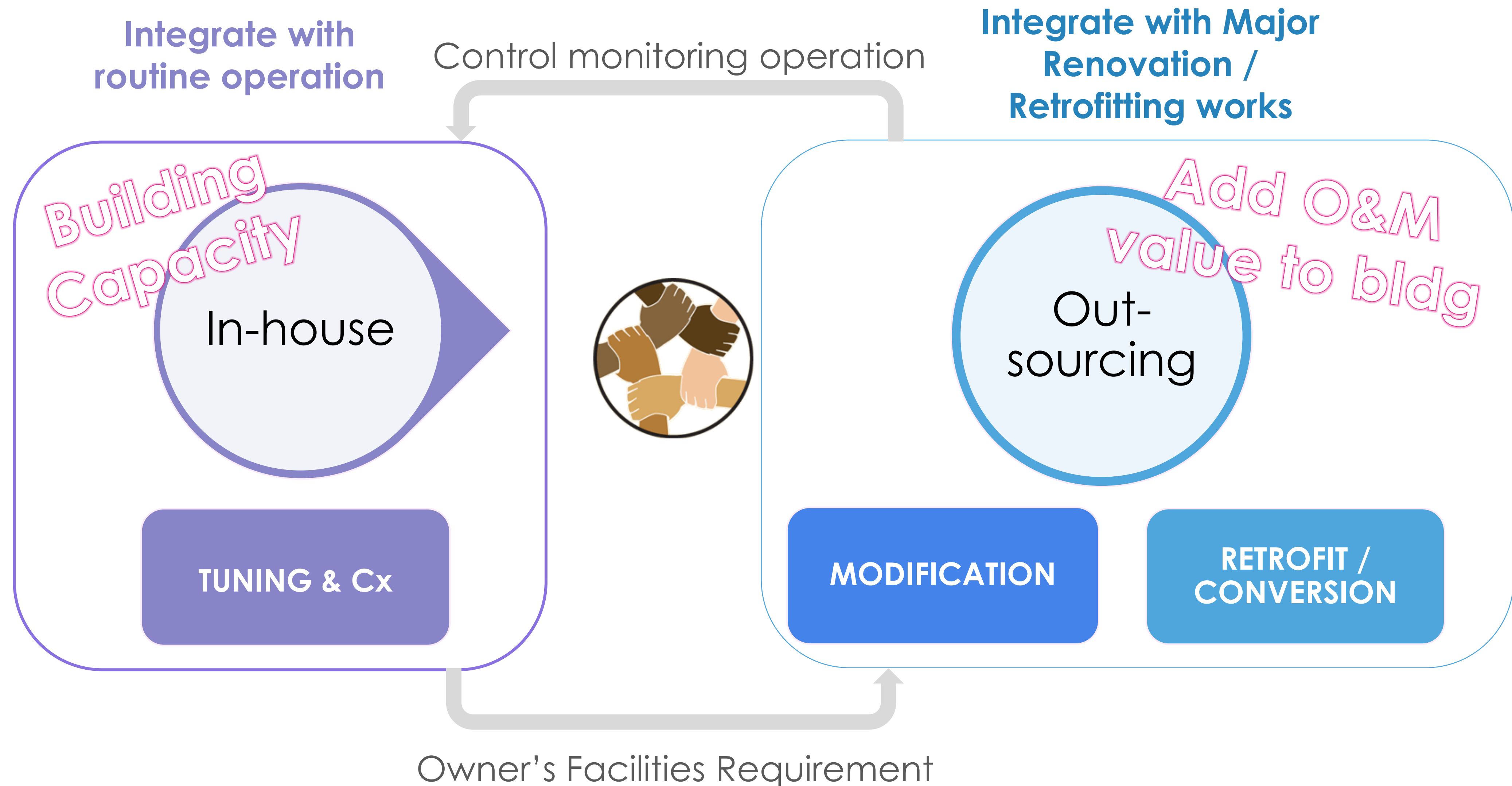


# Retro-commissioning (RCx) – Investment





# Retro-commissioning (RCx) – Investment





# Retro-commissioning (RCx) – Investment

Integrate with routine operation



Integrate with Major Renovation / Retrofitting works

**MANUAL WORKS**



Late Jan to early Feb 2021

**MODIFICATION**

**RETROFIT /  
CONVERSION**



CLP



HKE



15 Dec, 2020 (Tue)

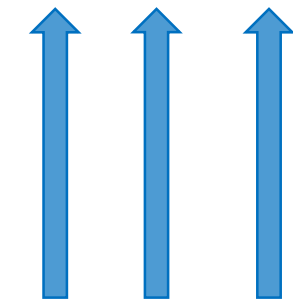


# Retro-commissioning (RCx) – Competence

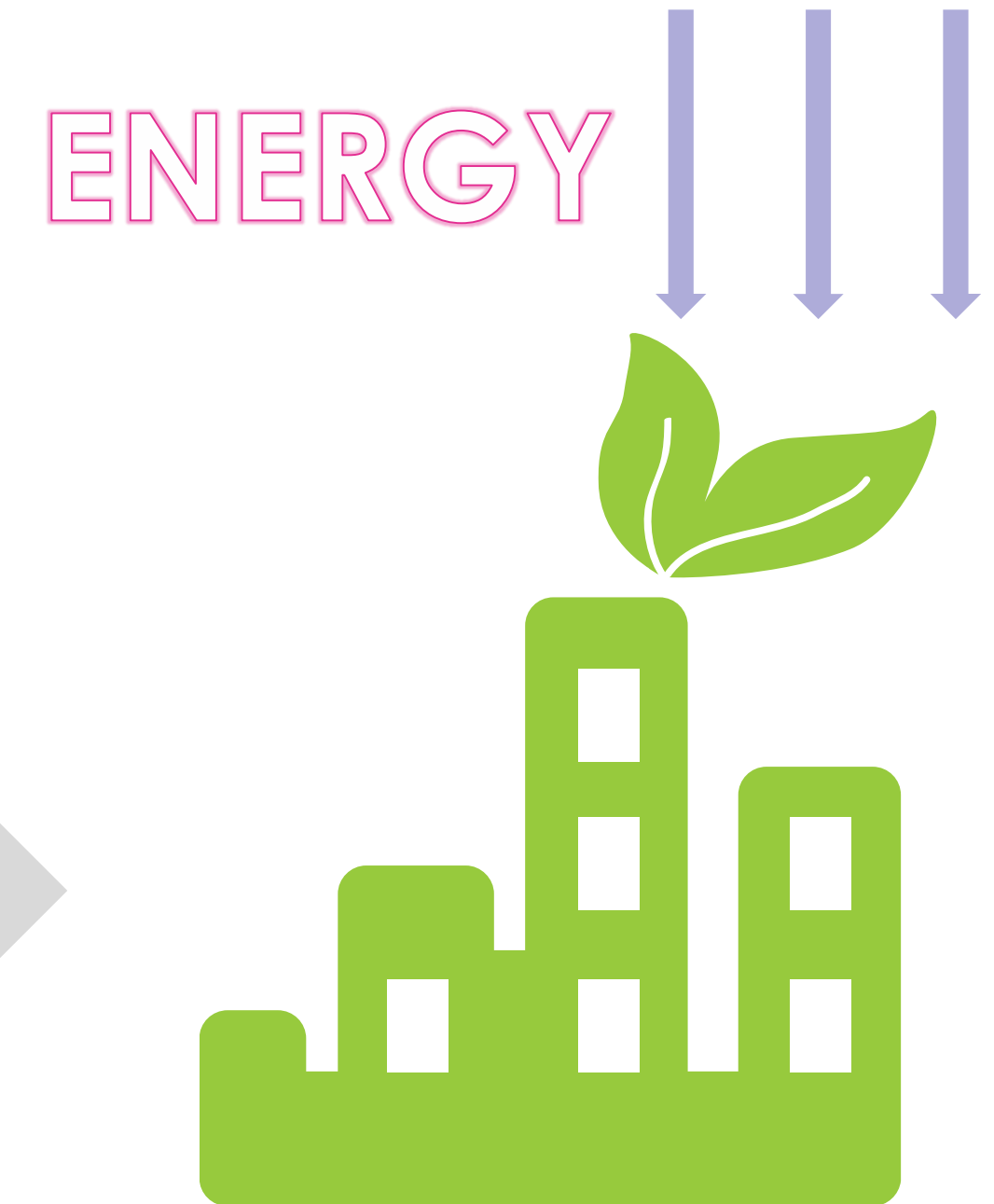


Professionalism  
Practitioner

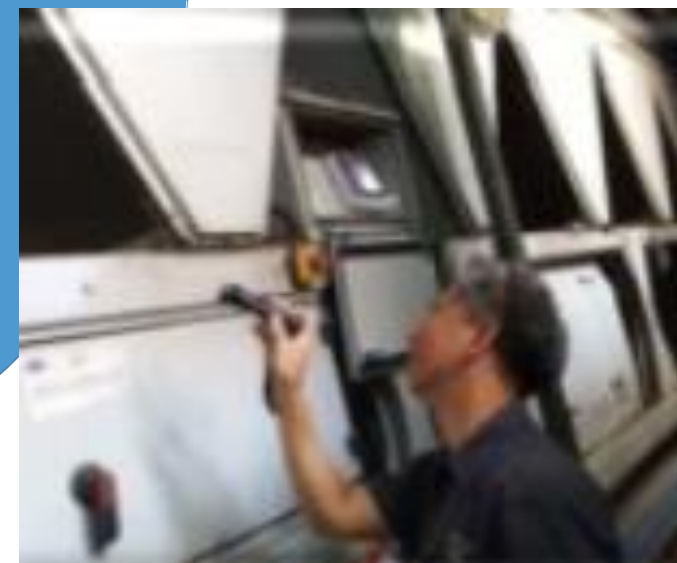
Competence  
O&M Team



Benefit /  
Investment



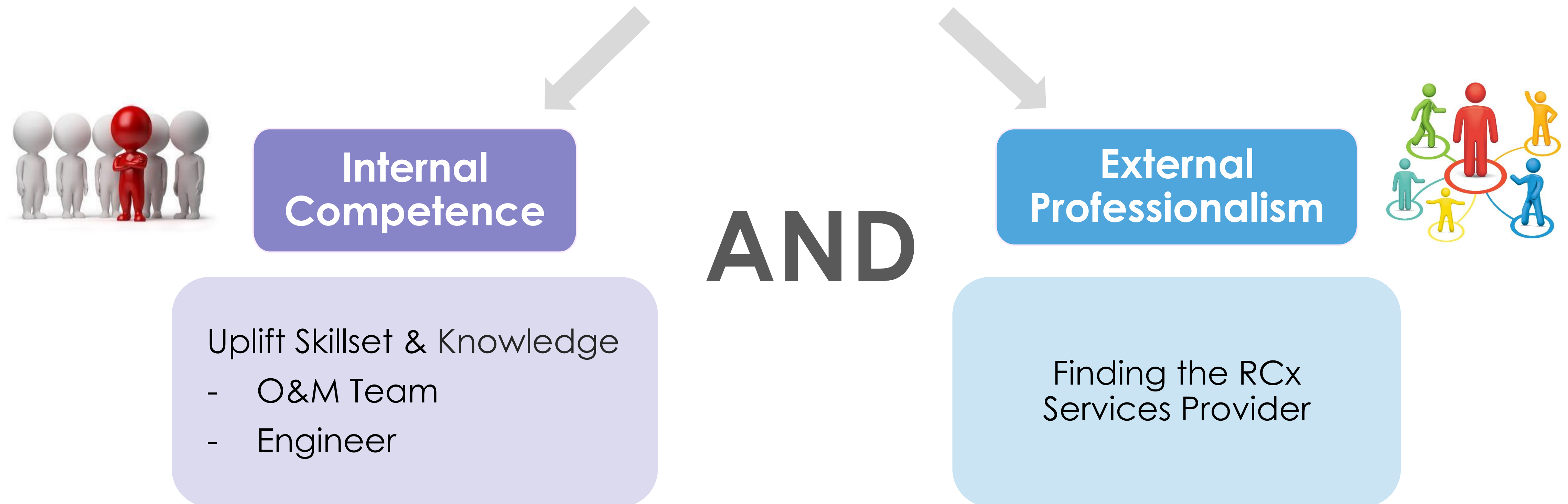
Energy Efficient in  
Operation





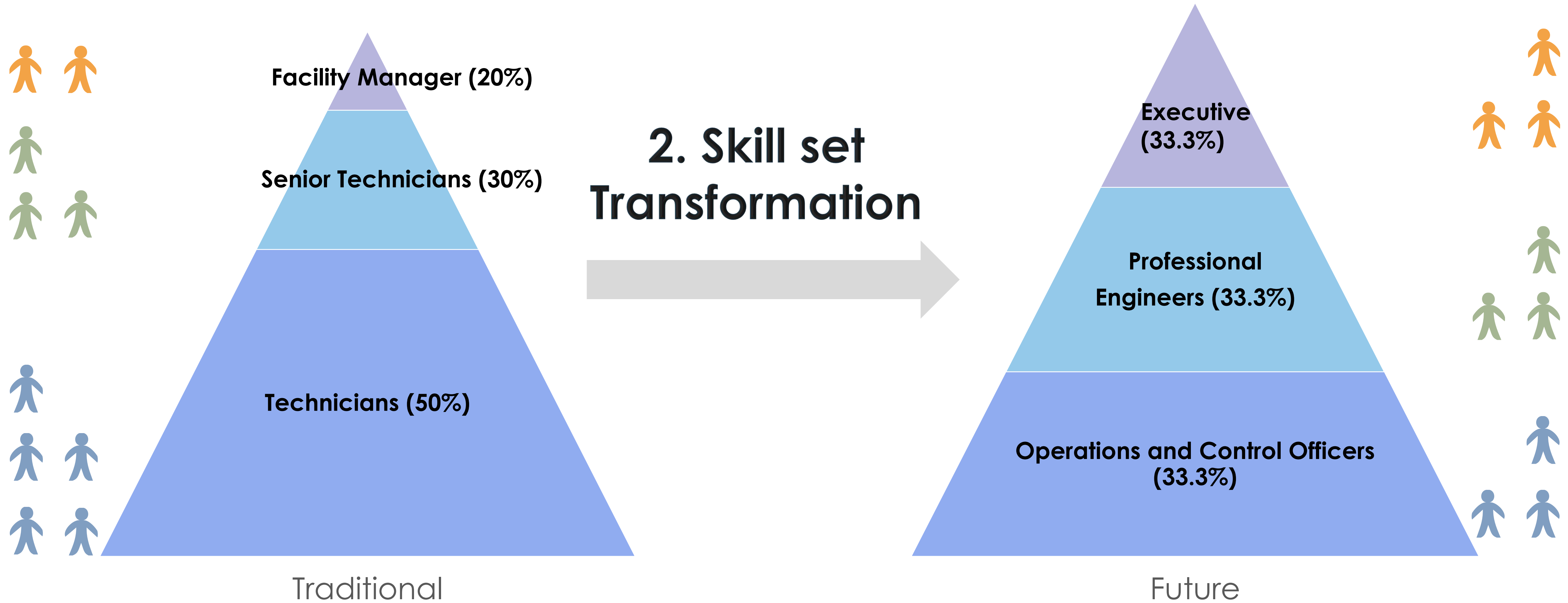
# Retro-commissioning (RCx) – Competence

## 1. How to Consider Professionalism and Competence ?





# Retro-commissioning (RCx) – Competence





# Retro-commissioning (RCx) – Competence

## Traditional Operation & Maintenance (O&M)



Manual & Routine  
Operation





# Retro-commissioning (RCx) – Competence

## Future Facility Management (FM)

Control Monitoring  
Operation &  
Condition-based  
Maintenance



[Source: <https://inno.emsd.gov.hk>]

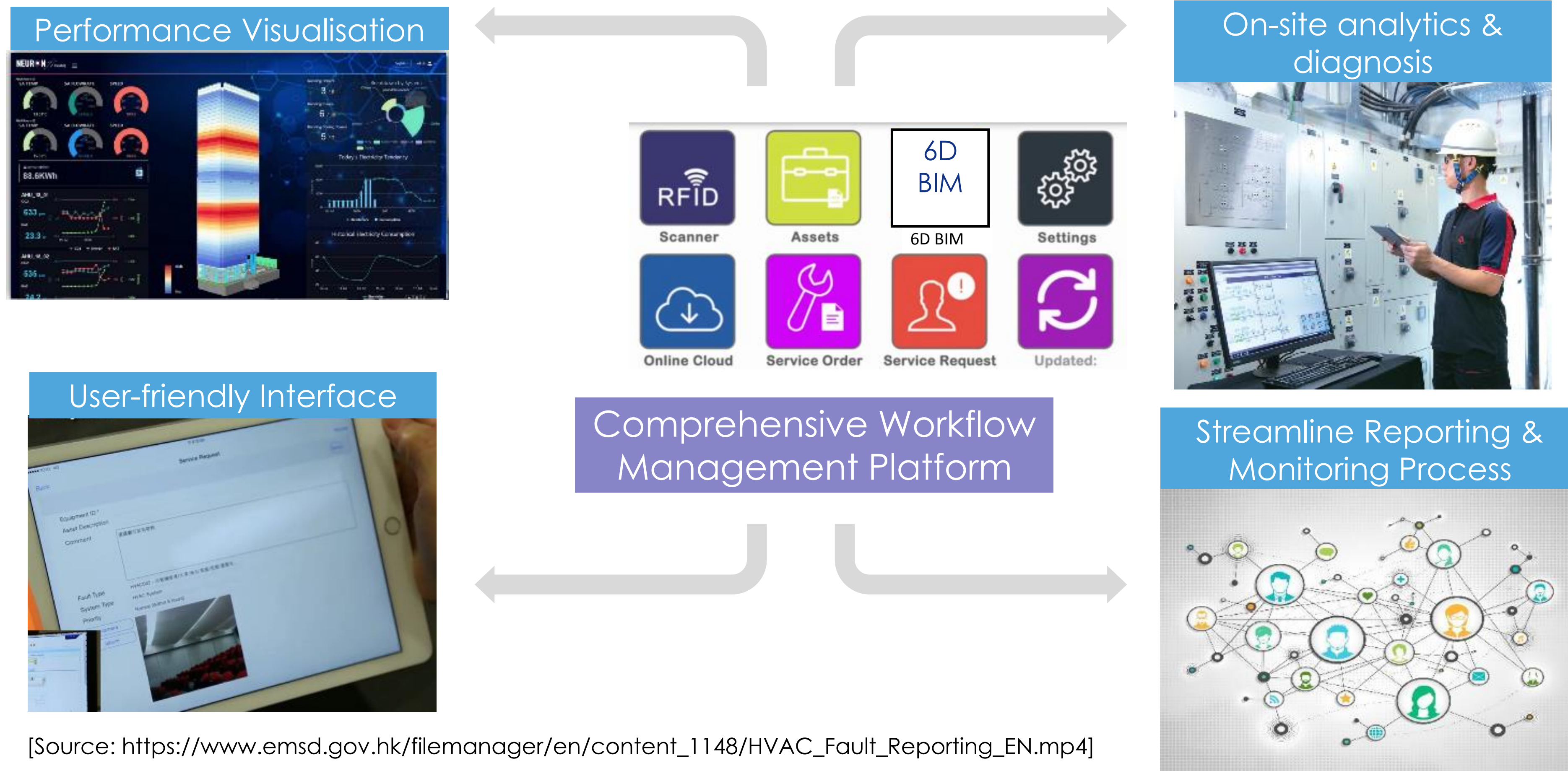


11 Dec 2020 (Fri)



# Retro-commissioning (RCx) – Competence

## Future Facility Management (FM) – BIM-Asset Management System





# Retro-commissioning (RCx) – Competence

## How to enhance in-house Competence and work with External Professionalism ?

Uplift Skillset & Knowledge

- O&M Team
- Engineer



11 Dec 2020 (Wed)  
**15 Dec 2020 (Fri)**



Late Jan to  
early Feb 2021



**RCx Training and Registration Scheme**



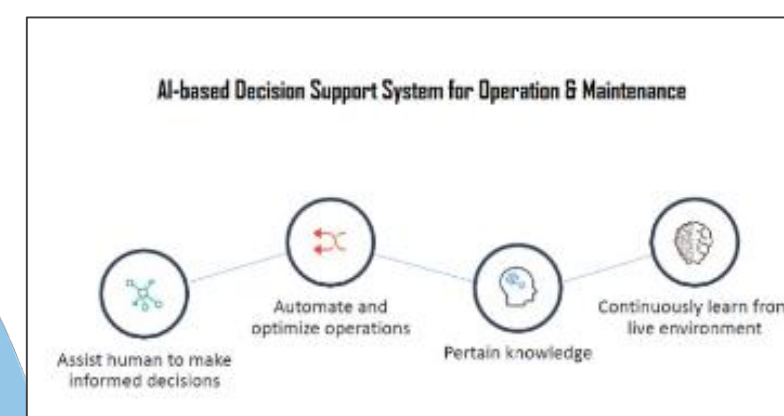
# Retro-commissioning (RCx) – Technology Development

Use of Smart Technologies

A.I., IoT

Use of Operating Data

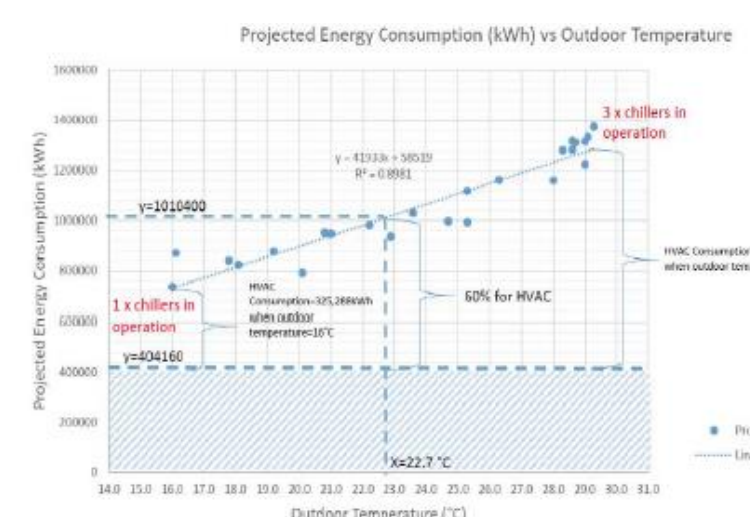
CCMS, BIM



## Tech. Transformation



Sustainable,  
Intelligent, Health





# Retro-commissioning (RCx) – Technology Transformation

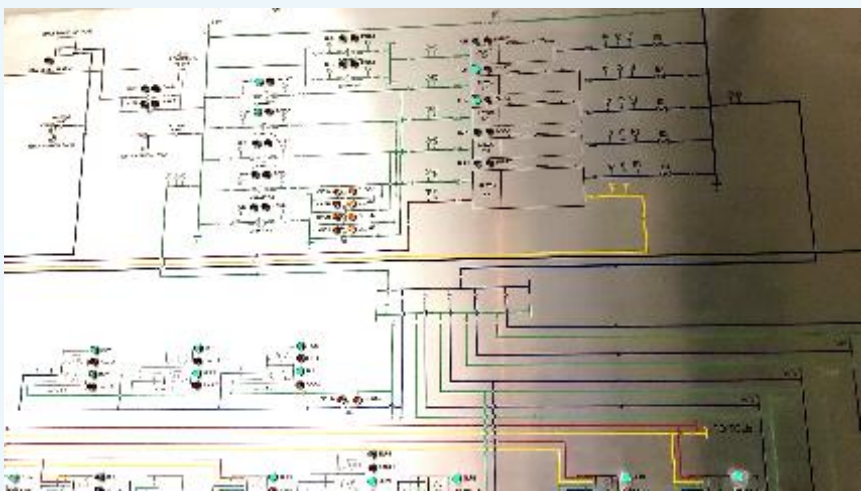
## How to adopt new technology for data collection?

1) Local Control  
(On/Off)



Local Control (On/Off)

2) Mimic  
Panel



Mimic Panel

3) BMS/  
CCMS



BMS/CCMS

4) A.I.



A.I. Platform



# Retro-commissioning (RCx) – Technology Transformation

## How to adopt new technology for data collection?

Indicate the condition

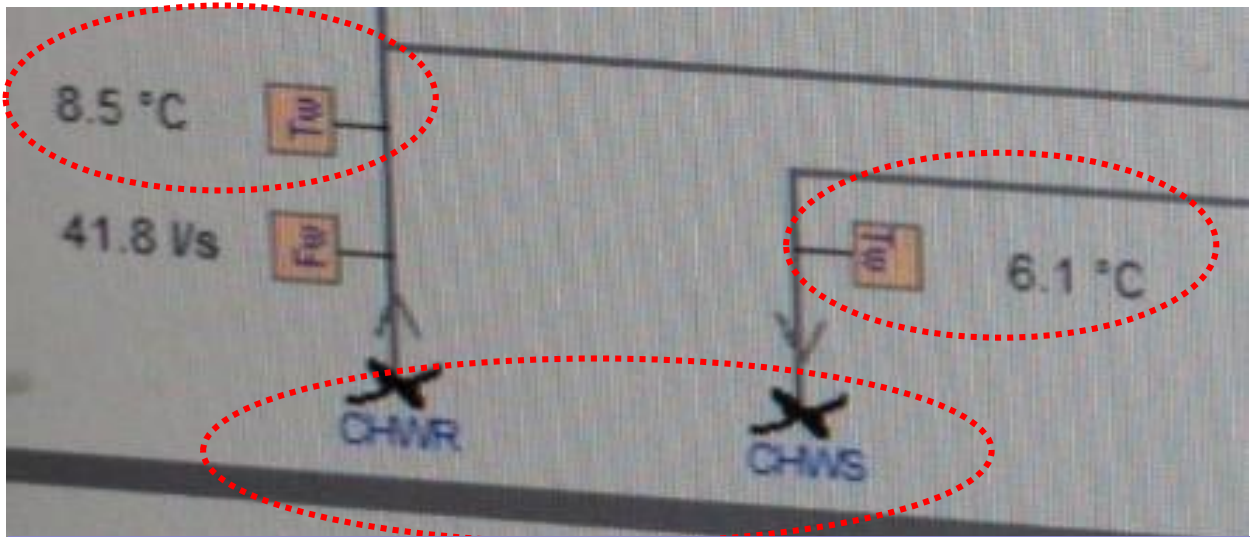


Mercury-in-glass Thermometers with 1°C magnitudes of incremental units

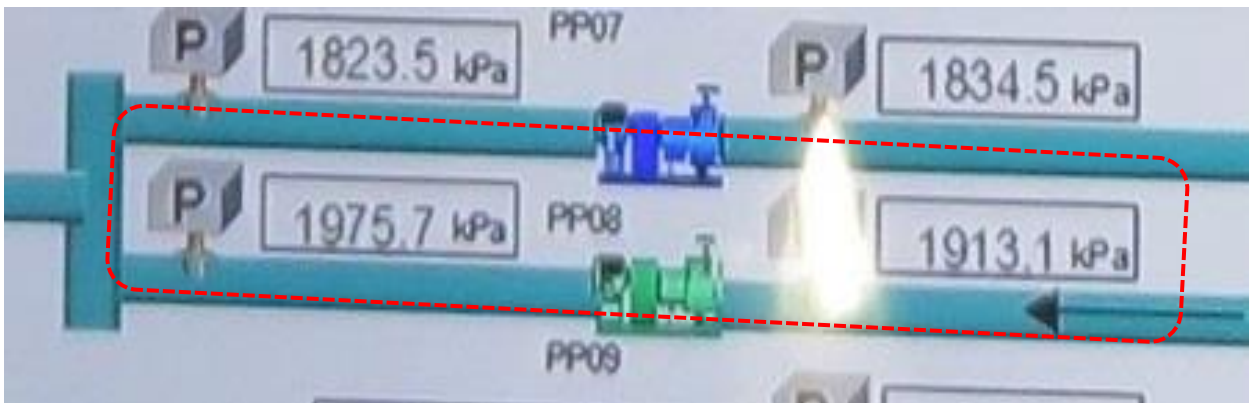


Pressure Gauge with wide range

Control & monitor the changes



Chiller Water Temperature Diff. (TCHWR - TCHWS) shown in BMS



Differential Pressure of Primary/Secondary Chiller Water Pump ( $\Delta$ PPCHP/SCHP) shown in BMS

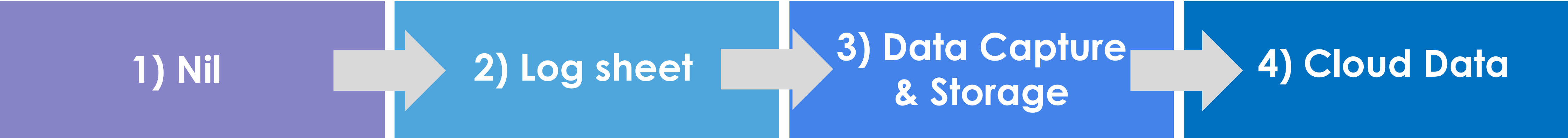


BMS



# Retro-commissioning (RCx) – Technology Transformation

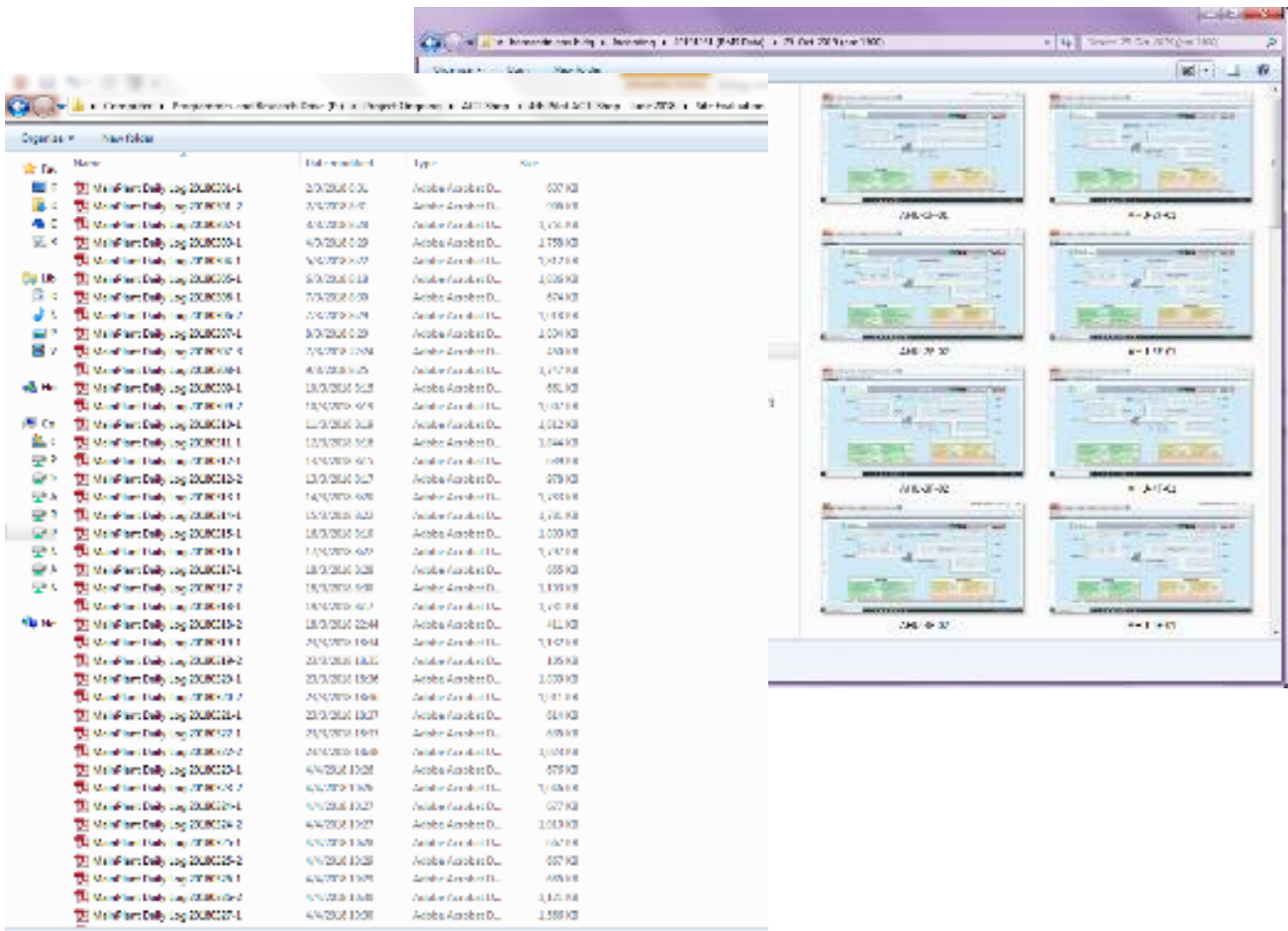
## How to adopt new technology for data collection?



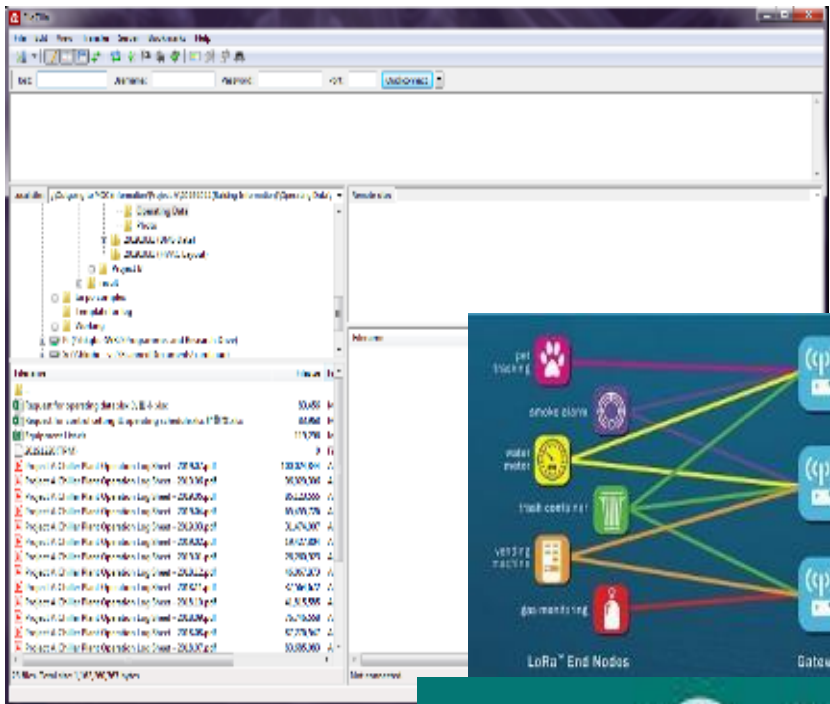
Data log



By Manual Data Log



Data Capture & Computer Storage



Use of BIG Data



Cloud Data

[Source: [https://inno.emsd.gov.hk/en/it-wish-list/index\\_id\\_238.html](https://inno.emsd.gov.hk/en/it-wish-list/index_id_238.html)  
[https://inno.emsd.gov.hk/tc/it-solutions/index\\_id\\_52.html](https://inno.emsd.gov.hk/tc/it-solutions/index_id_52.html)]



# Retro-commissioning (RCx) – Technology Transformation

How to make use of  
new technology &  
operating data in RCx?

- A.I. Technology
- IoT Technology
- Operating Data



11 Dec 2020 (Fri)



15 Dec, 2020 (Tue)



Late Jan to early Feb 2021

How to find the  
external funding for  
technologies?

- Funding







**Achievement for the Campus/Buildings**

5



# Achievement for the Campus/Buildings



- Uplifting the FM knowledge and practices in O&M Industry;
- Promoting diversification of energy-saving initiatives;
- Improving and keeping the campus/building system operated at energy efficiency, healthy and high performance conditions;
- Enhancing future RCx development and integration with retrofitting, major renovation;
- Accelerating advancing net zero carbon buildings by 2050.



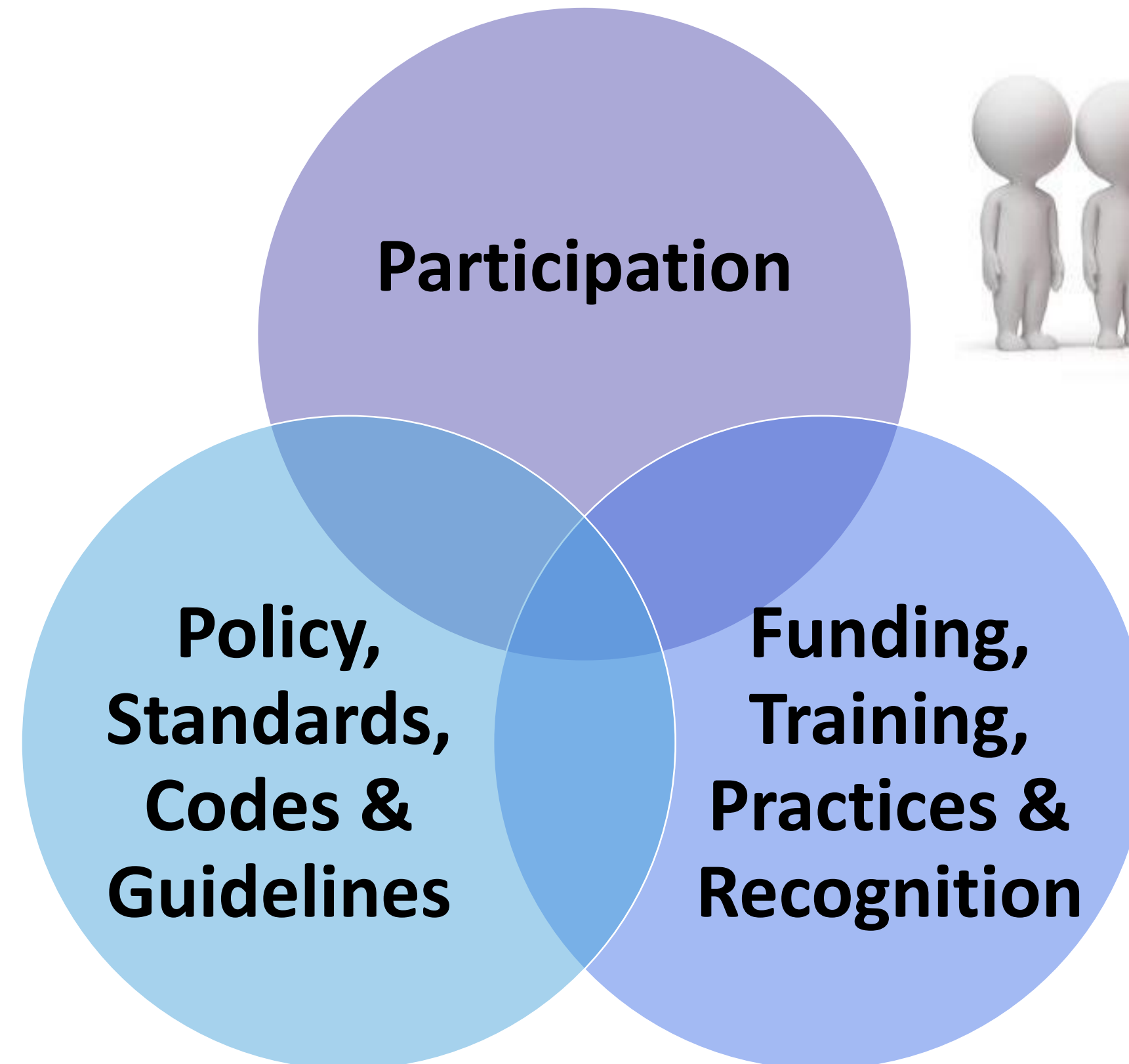
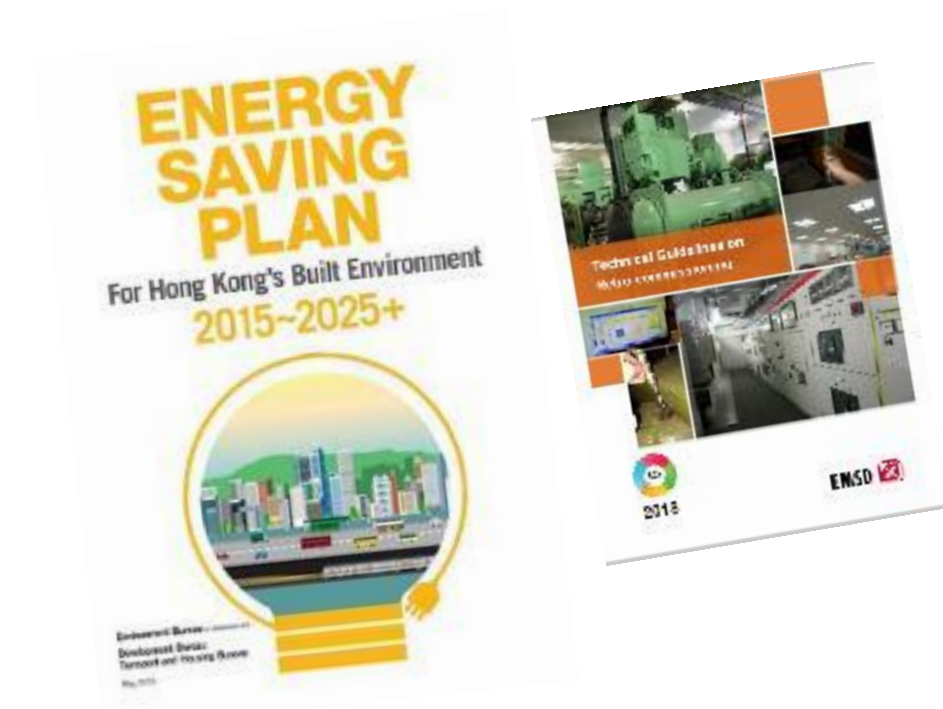




## Conclusion



# Conclusion





# Green Schools 2.0 for RCx

## PROFESSIONAL TALKS

**Date: 2 Dec 2020 (Wed) (1 hour)**

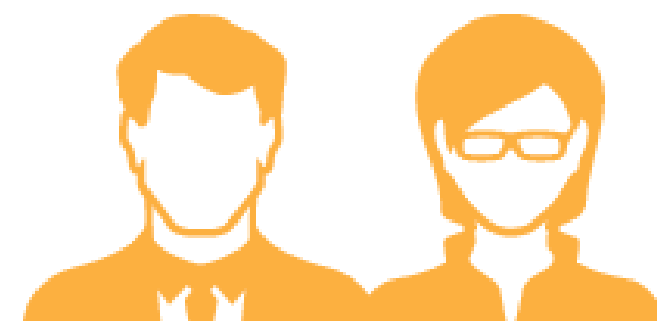
1. Introduction of EMSD Technical Guidelines on Retro-commissioning
2. Sharing of successful cases

**Date: 11 Dec 2020 (Fri) (1 hour)**

1. Introduction of use of operating data
2. Introduction of smart technologies to facilitate RCx

**Date: 15 Dec 2020 (Tue) (1 hour)**

1. HKGBC RCx Training and Registration Scheme
2. Utilities funding scheme



## WORKSHOP CUM SEMINARS

**Date: Late Jan to early Feb 2021 (1 hour)**

1. Online demonstration video
  - RCx site evaluation
  - Implementation of energy saving measures, measurement and verification process
2. RCx services and products sharing
3. Q&A







# Green Schools 2.0

## for Retro-commissioning

Enquiry: 3994 8818

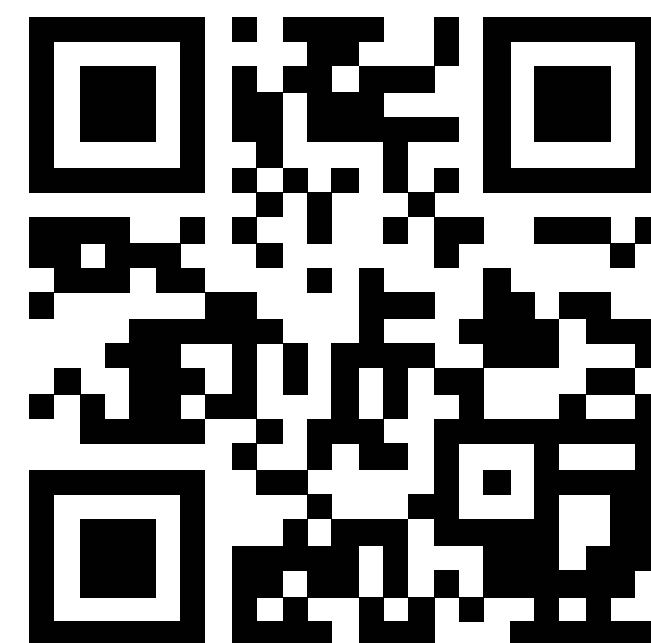
## REGISTER NOW FOR FREE

- Engagement Meeting (Pre-recorded video)
- Induction Talks (Pre-recorded video)
- Professional Talks
- Workshop cum Seminars

If you are interested, please refer to our website for details and registration:

<http://greenschools2.hkgbc.org.hk/>

### Register NOW!



EMSD RCx  
Resources  
Centre



HKGBC RCx Training  
and Registration  
Scheme





# Utilities Funding Scheme- RCx

Electricity  
Supplier



CLP



HKE



Funding  
Name

Eco-Building Fund

Smart Power Building Fund

Energy  
Efficiency  
Projects

- Provide subsidies for energy-saving improvement works of:-

☐ Retrofitting

**NEW**

☐ RCx

☐ Smart building technologies

Subsidy Brief

- Subsidised amount is depended on the types and scale of projects and determined based on expenditure, saving and duration of projects but subject to a cap
- Disbursed on a reimbursement basis



15 Dec, 2020 (Tue)



**Your feedback is  
important to us!**



<https://forms.gle/ocX1yRKnqMWbjuhXA>

