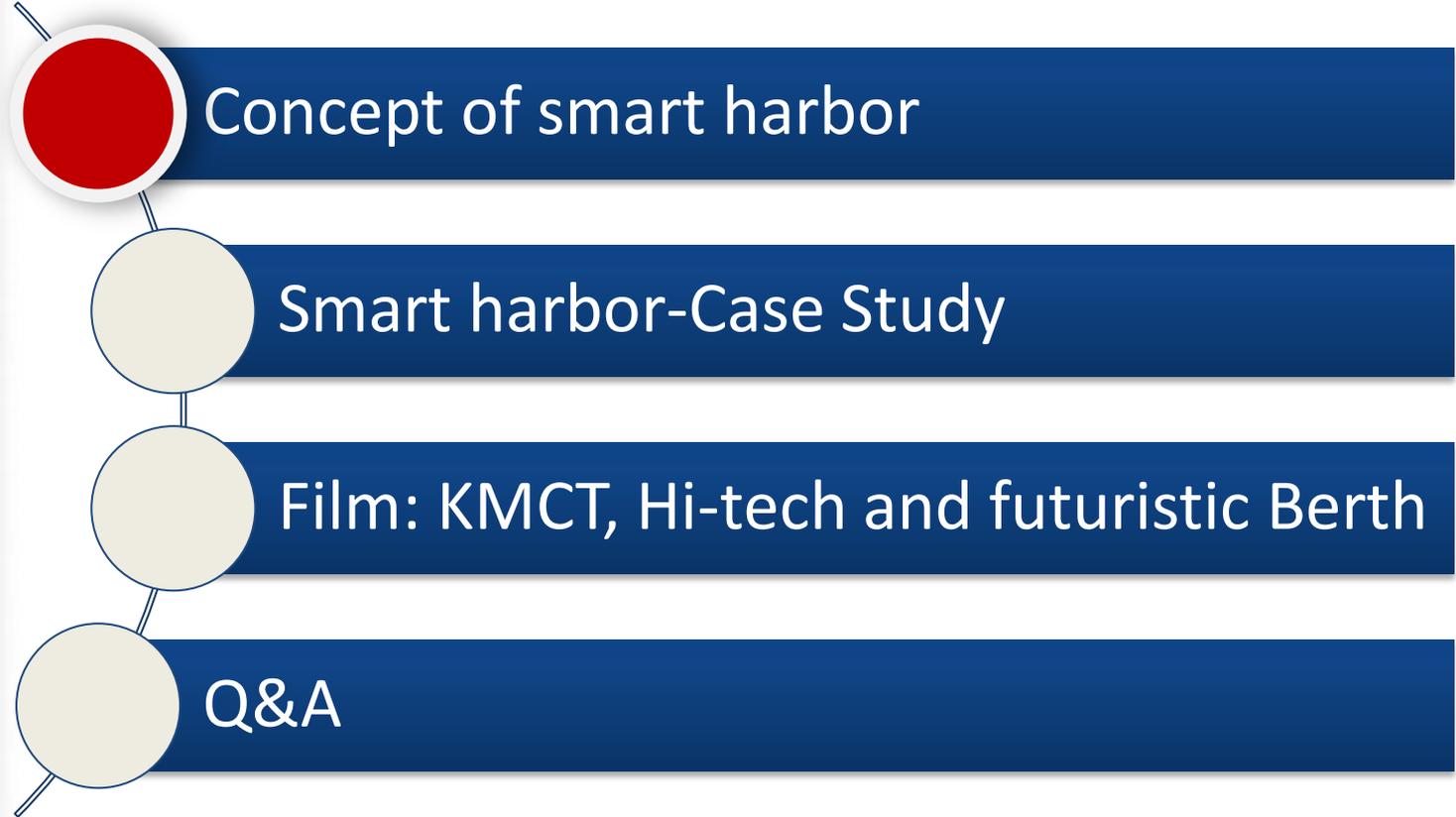


SMART HARBOR



TAIWAN **I**NTERNATIONAL **P**ORTS **C**ORPORATION, LTD.
Lin, Chun-Tse, Assistant Administrator

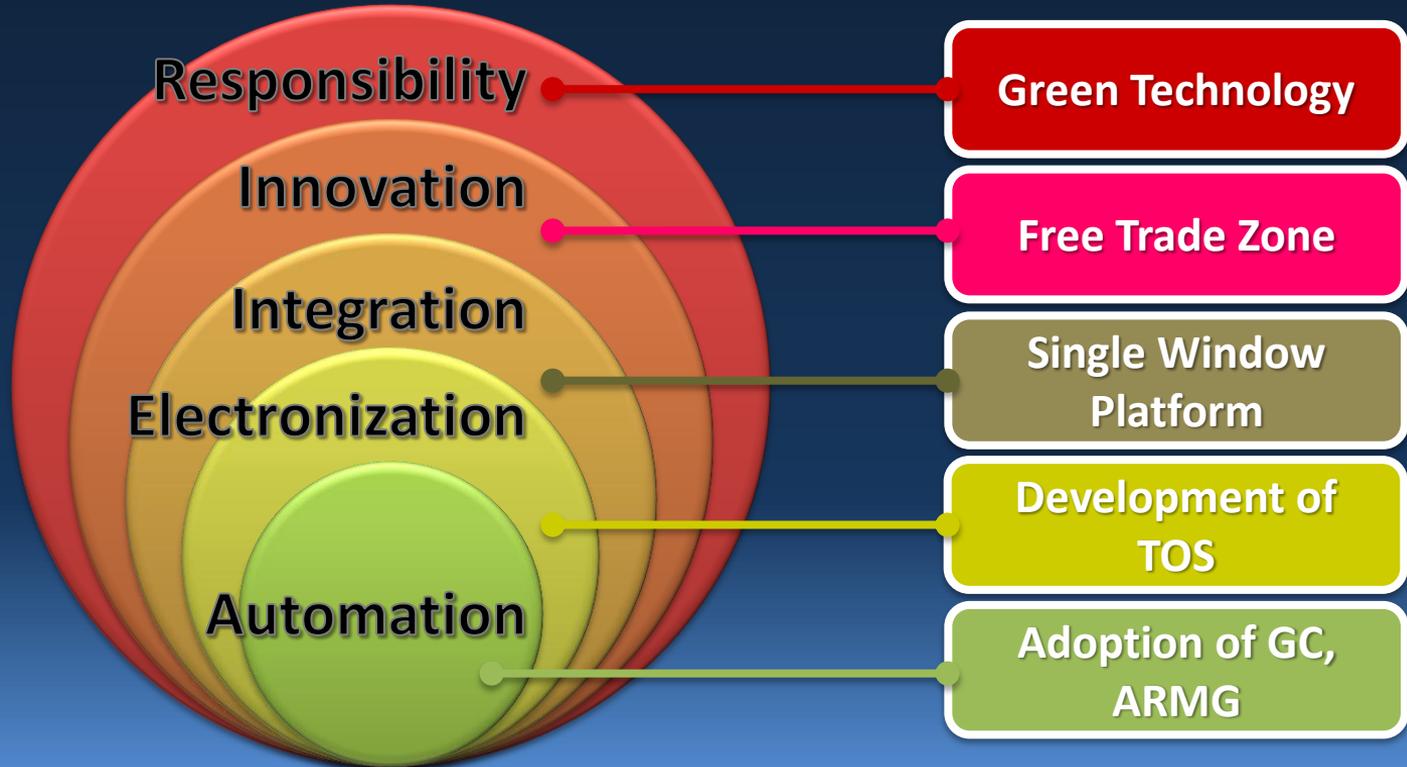


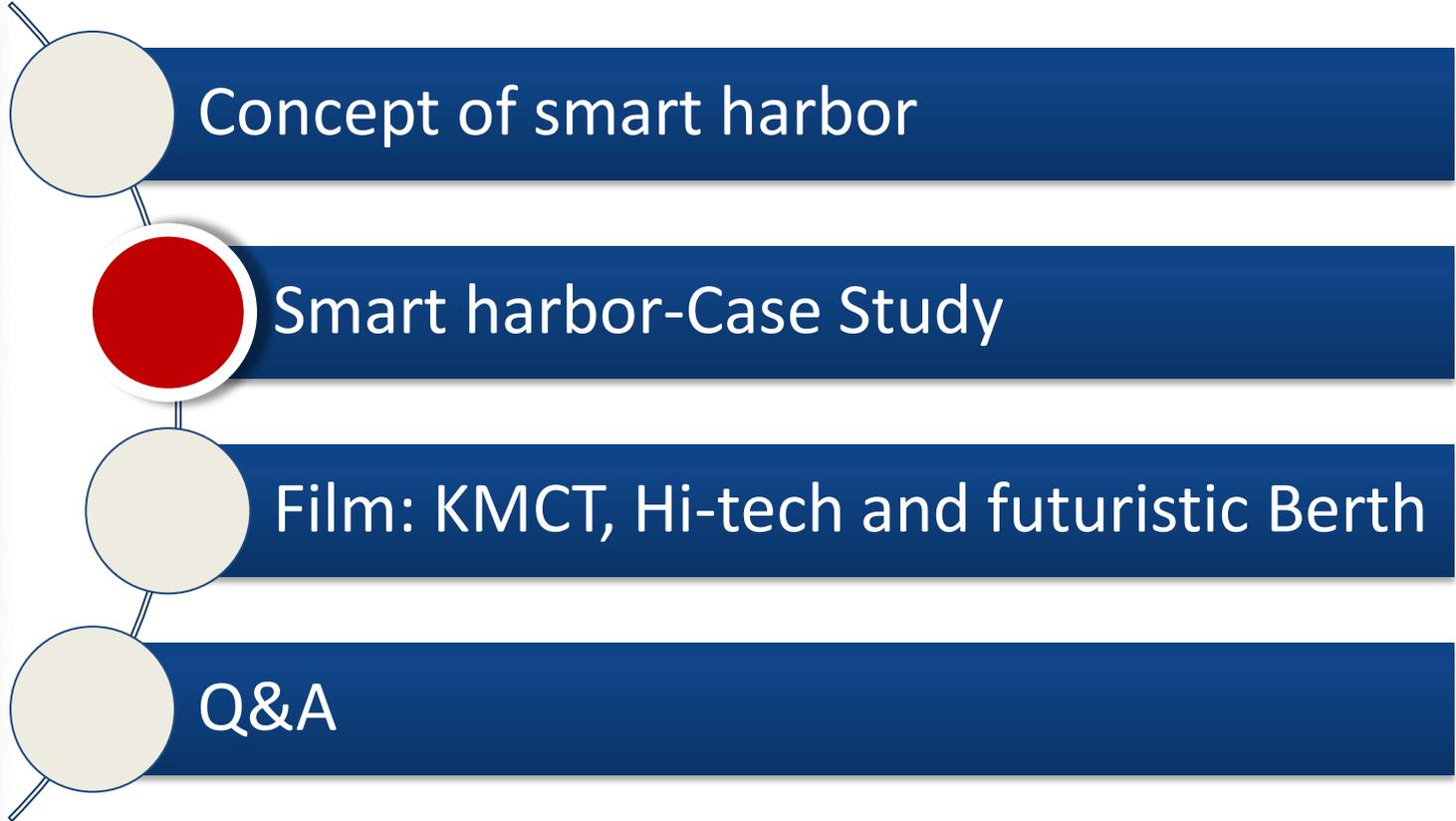
Concept of Smart Harbor

WHAT is the definition of a **SMART HARBOR**?
HOW can a harbor be **SMART**?



Core Concept







Taiwan Ports Profile



A vertical decorative bar on the left side of the slide, featuring a dark blue background with a starry space pattern and a glowing blue horizon line at the bottom, suggesting a planet or moon.

CASE 1: Automated Checkpoint System

- **Integrated Checkpoint System**
 - OCR, Infrared Rays, Inductance, RFID
 - RFID and LED Instruction
 - Integrated Information System
- **Benefits**



Automated Checkpoint System



ACS is designed to alleviate the transit time of the cars, people and goods entering or leaving harbor areas, and to electronically manage the transit records.



Automated Checkpoint System



Before

- ✓ Cars need to stop and wait for the instruction from harbor police.
- ✓ Traffic jam in front of the gate.
- ✓ Dangerous for the drivers to walk in the traffic.

- ✓ Non-stop speedy transit.
- ✓ No need for drivers to get off cars.
- ✓ Reduce the work load of the local harbor police.

Now





Automated Checkpoint System



RFID Reader(passport)



Infrared Rays



Inductance



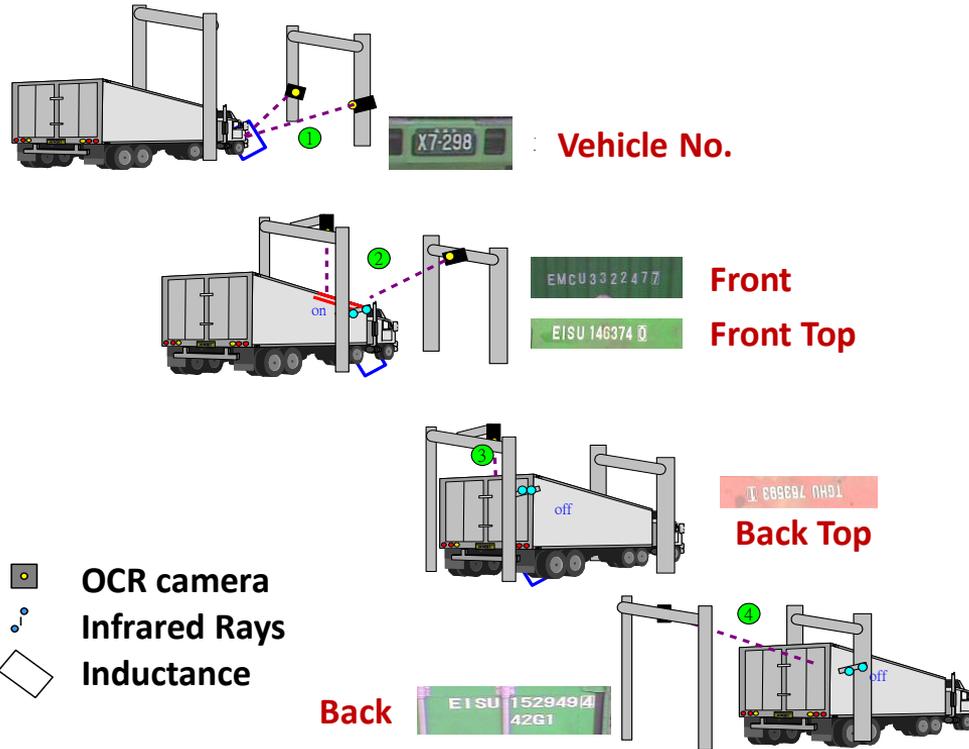
OCR(Container No.)



OCR(Vehicle No.)

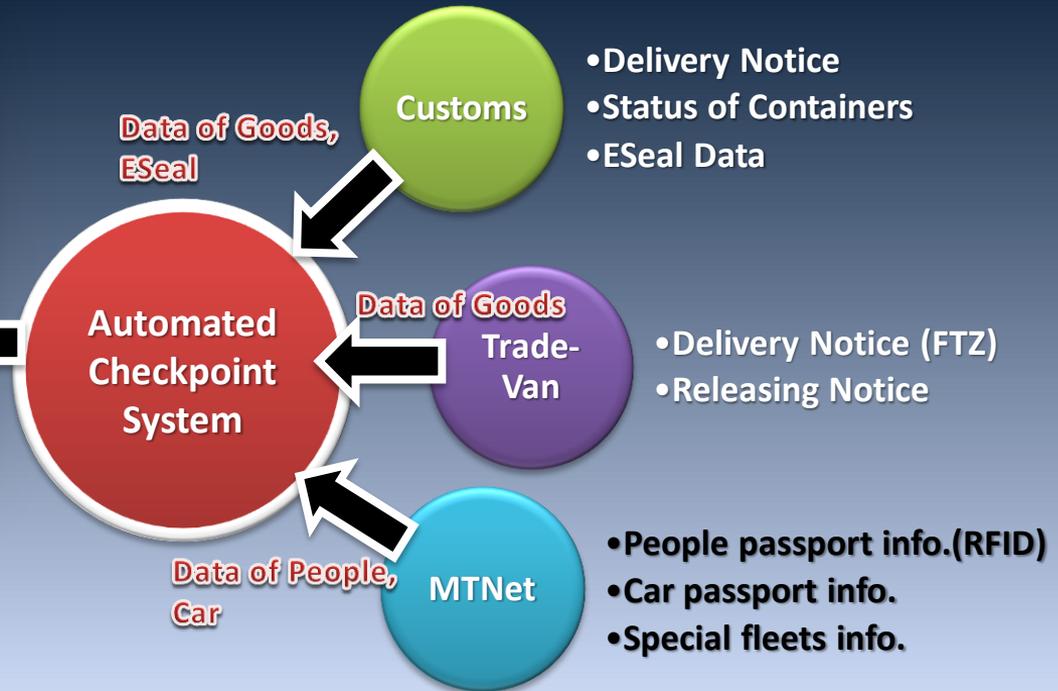


Flow of OCR Operation





Integrated Information System



- ✓ ACS integrates information from customs, Trade-Van, and MTNet.
- ✓ ACS generates releasing instruction, and the result is shown on LED screen.



Benefits



**TOTAL
102 ACS
Lanes built**

- The transit time has decreased from average 4 minutes to average **4 seconds per trip**.
- Approximate **40 million NTD of fuel** is saved per year.
- Approximate **7.5 million NTD of paper** is saved per year.
- Approximate **10 million NTD of escort fee** has been saved per year.
- Decrease the manpower needs of the Harbor Police to approximate **60,000 hours**.



CASE 2: KMCT Automated Terminal

- **Fully Automated Yard Operation**
 - Advanced Facilities for Shiplside/Yard Operation
 - Remote Control Center(RCC)
 - RFID and LED Instruction
- **Advanced Auto Gate System(AGS)**
 - OCR, Infrared Rays, Inductance
 - KIOSKs
- **Green Terminal**
 - Shore Electricity
 - Solar and Wind Energy
- **Benefits**



Advanced Facilities



Quayside Operation:

- ✓ Advanced Double Hoist Gantry Crane(GC)
- ✓ Lift two 40-ft containers or four 20-fit containers simultaneously and 200 containers per hour



Yard Operation:

- ✓ Automated Rail Mounted Gantry Crane(ARMG)
- ✓ ARMG can be triggered by RFID



Automated Terminal Operation

Remote Control Center:

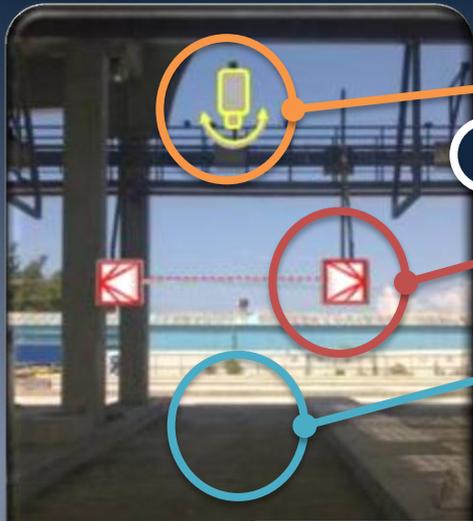
- ✓ In RCC, a person is able to operate 4-6 ARMG



- RFID activates ARMG
- LED screen reveals driving instructions



Auto Gate System



Optical Character Recognition(OCR):

- ✓ Vehicle No.
- ✓ Container No.

Infrared Rays:

- ✓ Container loaded on chassis or not

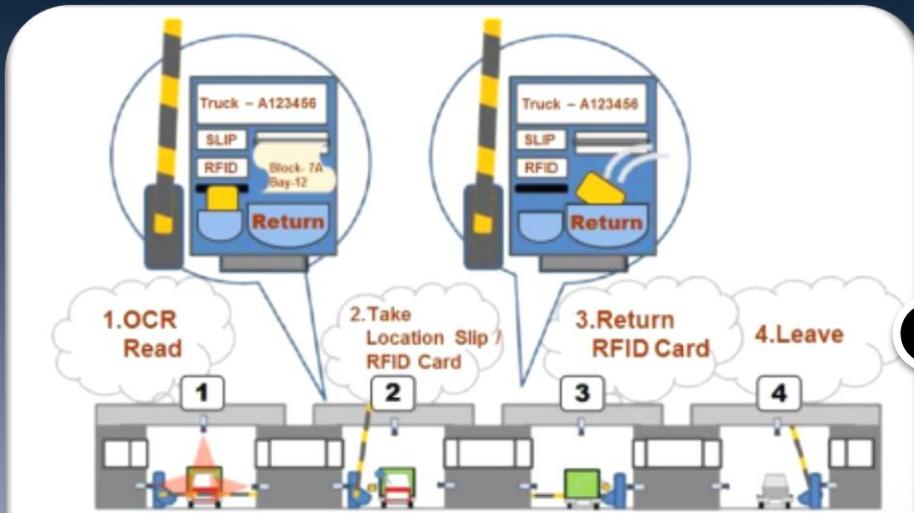
Inductance:

- ✓ Set underground
- ✓ Triggers OCR and Infrared Rays





KIOSK



KIOSKS make auto process and fast pass possible:

- ✓ No need to get off truck
- ✓ Auto-check ID/Pick-up slip
- ✓ Auto-output RFID card/location slip





Green Technology



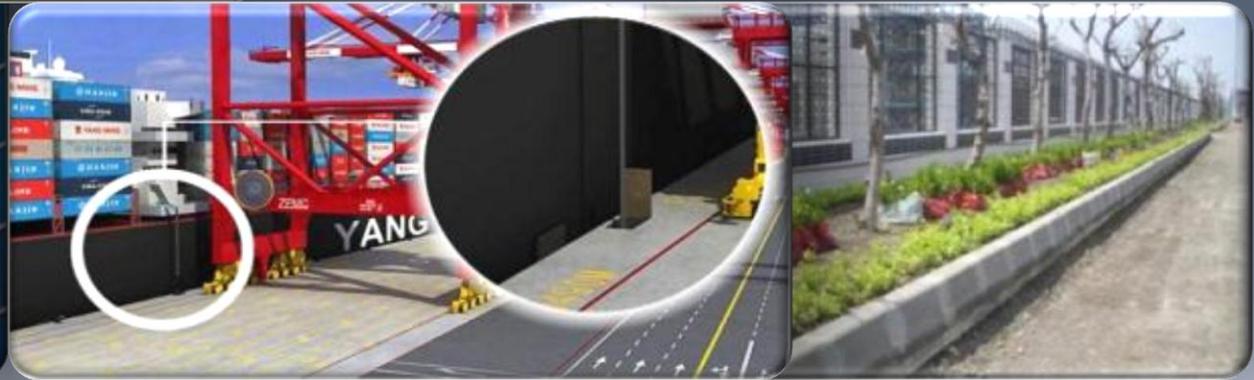
Solar Panel

Advanced Shore Electricity System:

- ✓ Reduces air pollution
- ✓ Energy conservation

Use of Solar and Wind Power .

Wastewater recycling & treatment.





Benefits



- The **field trailer lag time** is reduced to **17 minutes**.
- Advanced Double Hoist Gantry Crane greatly reduces the **turnaround time** of the vessels.
- OCR and RFID speed up **vehicle transit** and **container clearance**.
- A shore electricity system is estimated to **reduce 111.67 tons of carbon emissions** per year.
- Effective recycling is estimated to **recollect 100% of industrial sewage** and **80% of wastewater**.



CASE 3: Green Technology

- **Port of Hualien**

- Water Bank
- Benefits

- **Port of Taichung**

- 3D Green Building Parking Lot
- Wind Turbines

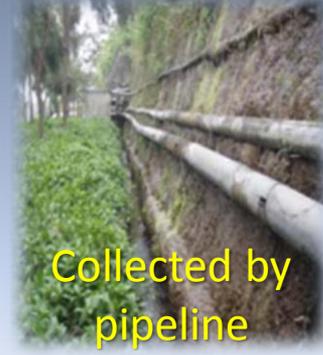


Hualien Port's Water Bank

Build 10 storage tanks close to the mountain, the total capacity is 1,669 m³.

Provide water 1,023,000 m³ annually.

Being a good neighbor to the nature does not necessarily require high technology.





Hualien Port's Water Bank



Spray irrigation



Sprinkler systems
for cooling



Separation of
drinking water

- ✓ Save about **11,770,000 NTD of water bill** per year.
- ✓ The built cost can be payback within half a year.
- ✓ Improve the relationship with communities.



Water conservation
merit award by water
resources agency



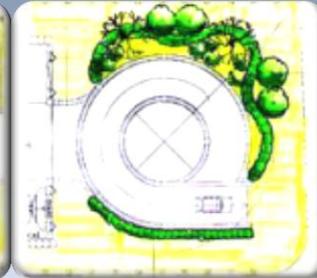
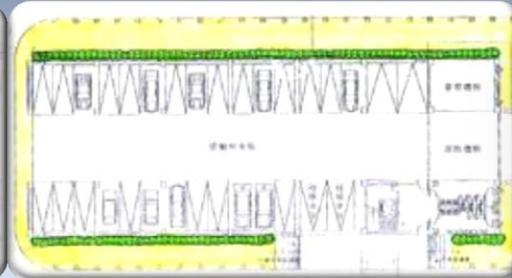
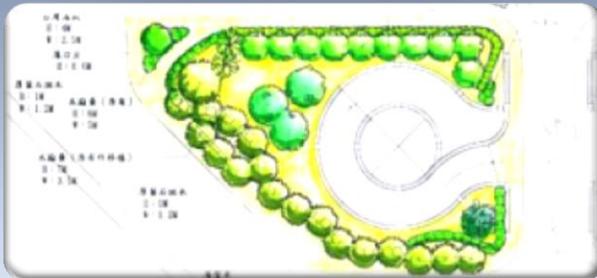
3D Green Building Parking Lot

Port of Taichung



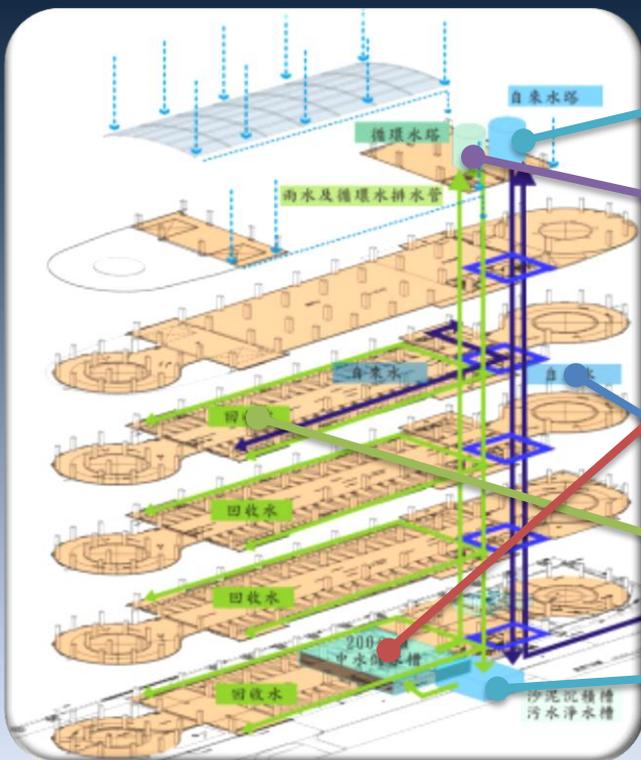
Authenticated Green Building:

- ✓ Efficiently using energy, water, and other resources
- ✓ Protecting occupant health and improving employee productivity
- ✓ Reducing waste, pollution and environmental degradation





3D Green Building Parking Lot



Recycling water tower

Rainwater & recycling water drain

200 ton reclaimed water tank

Tap water

Recycling water

Dust sump & Sewage tank

Water Resource:

- ✓ Collect rainwater and reclaimed water.
- ✓ **Save 30% Water bill** per year.

Energy:

- ✓ 735 energy saving lamps.
- ✓ Good natural lighting and ventilation.

Environmental afforestation:

- ✓ Increase rainwater conservation.
- ✓ Increase biodiversity.



Wind Turbine

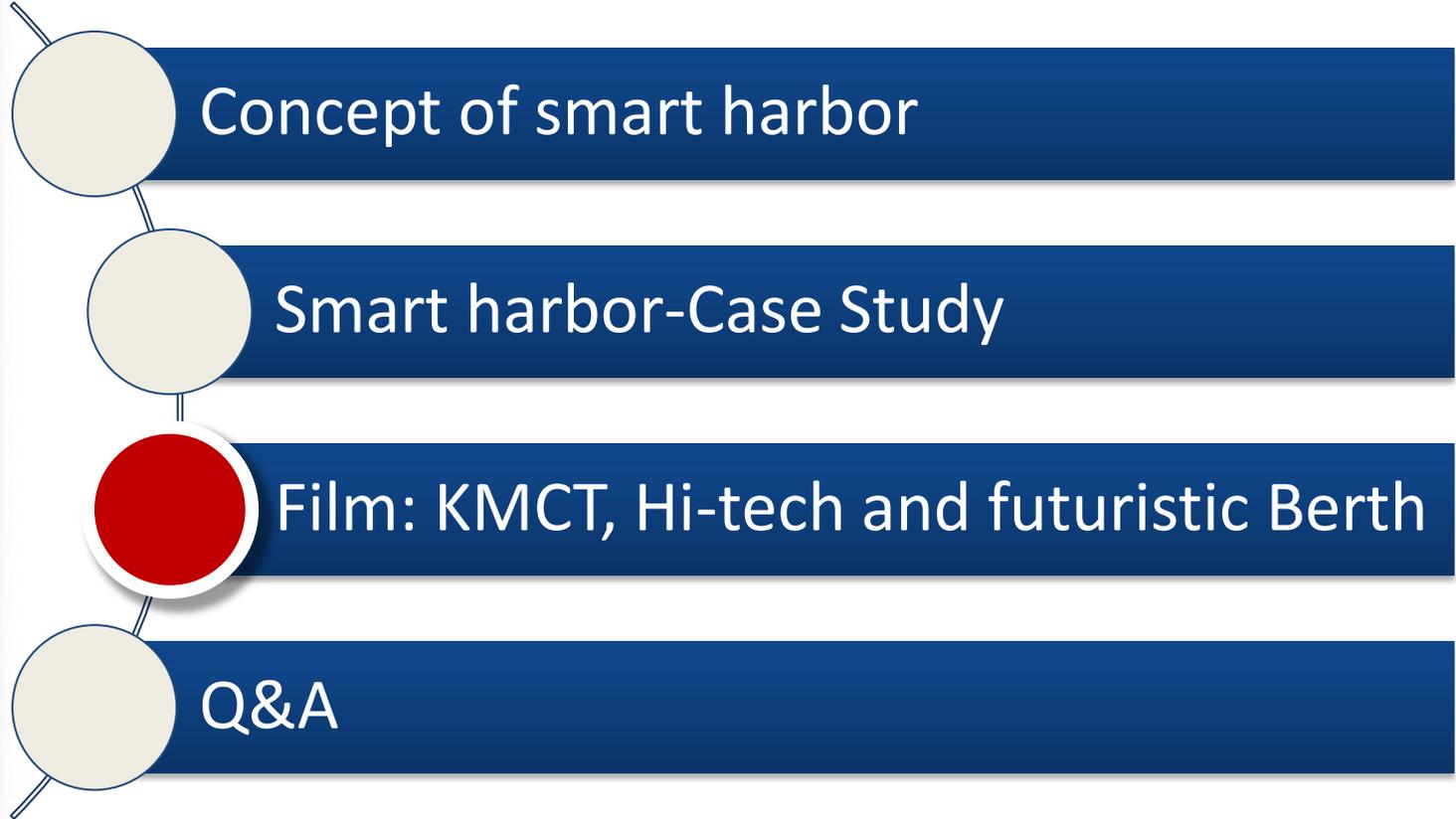
Harbor Ring Road, Port of Taichung



- ✓ Width: 4km long, 30m wide (including six two-way lanes, bike lanes and sidewalks)
- ✓ 10 wind turbines along the Harbor Ring Road.
- ✓ Near Gaomei Wetland, beautiful scenery.



Gaomei Wetland





Q&A



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