35th ASIAN RACING CONFERENCE
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Tracks
Sustainable use of resources

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More than protecting polar bears

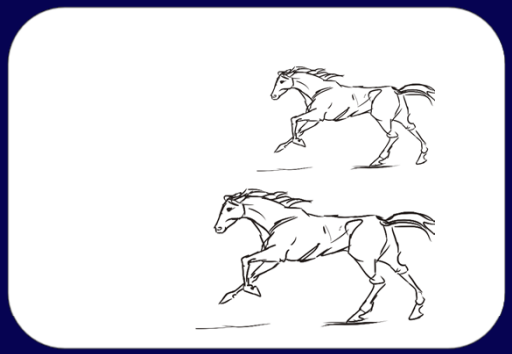
- With just a 2 degree global temperature rise, approximately 1 billion people around the world are at risk of water shortages, with around 10 million at risk from coastal flooding.
- NGOs engage the public, partners with businesses, works with professional associations and lobbies the government to reduce the impact of climate change.

Contents

SUSTAINABLE DEVELOPMENT

Sustainable development

Why is sustainable development important?



On-going business

- Utilize resources wisely
- Comply with the regulations

Economic benefits

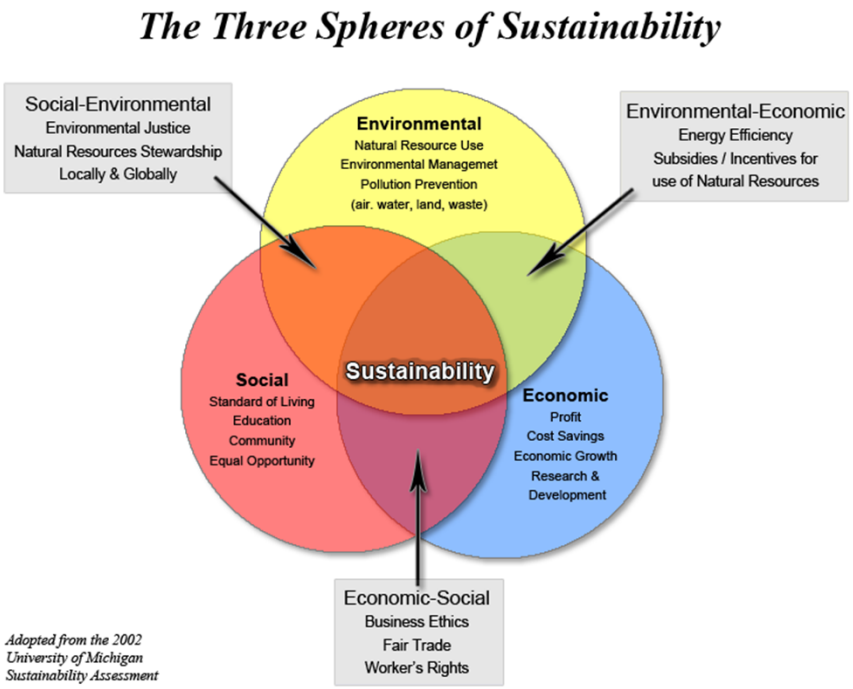
- Save costs in a long term

Industry brand

- Build image of social responsibility

Sustainable development

What is sustainable development?



Sustainable development

When can sustainable development be implemented?

- Whenever possible
- Take the 5 “R” into consideration when making decisions

Sustainable development

Where can sustainable development be implemented?

- Wherever possible
- tracks as an example

WATER MANAGEMENT

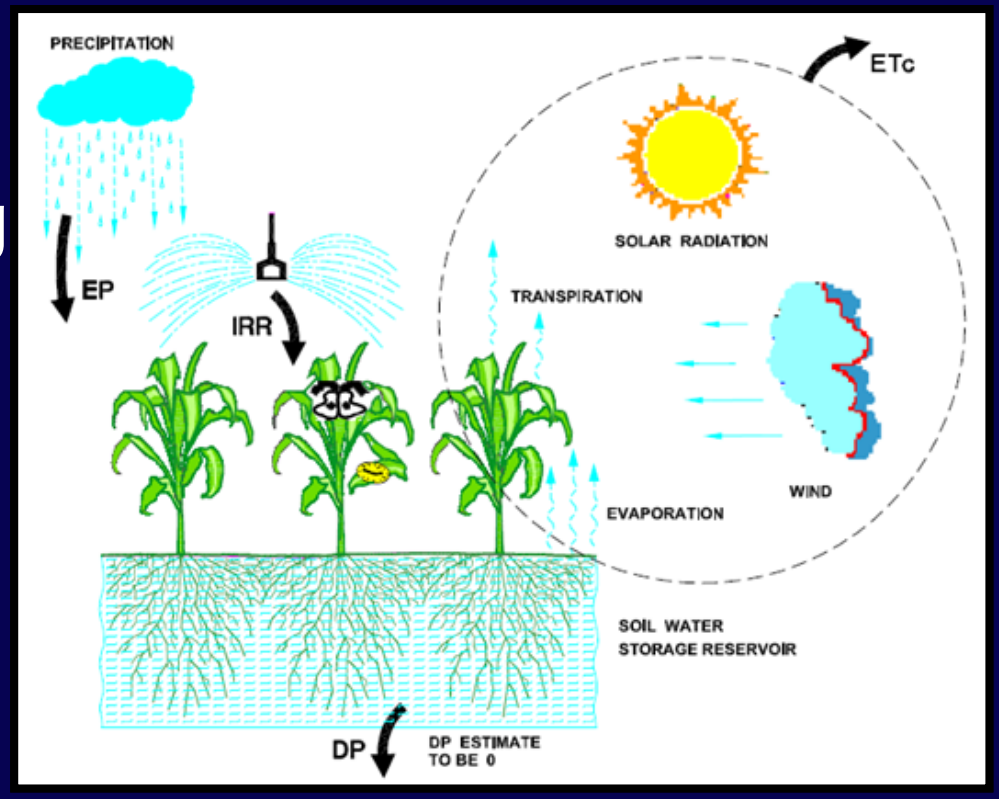
Water management

- Scarcity of freshwater
  - Concern around the world
- Freshwater source in HK
    - Rainfall captured in local reservoirs
    - Purchase from Guangdong, China
- Water conservation
  - water budget for tracks irrigation
  - water sources within race course

Water management

- Water precisely
  - Irrigation scheduling by water budget

Reduce



Water management

- Water balance equation: CSWC = PSWC + EP + IRR - ETc - DP
  - CSWC = current soil water content (today) [mm]
  - PSWC = previous soil water content (yesterday) [mm]
  - EP = effective precipitation since yesterday [mm]
  - IRR = irrigation since yesterday [mm]
  - ETc = crop evapotranspiration [mm]
  - DP = deep percolation, water lost beyond the root zone [mm]

Soil Water Storage (SWS) Capacity: 110 **mm**
Maximum Allowable Deficit (MAD): 55 **mm** (once the current water storage reaches this level, irrigation should begin)

Date	Previous Soil Water Storage	+	Effective Precipitation	+	Net Irrigation	–	Reference ET	x	Crop Coefficient	=	Crop Water Use	=	Current Soil Water Storage
	PSWS		EP		IRR		ET_o		K_c		ET_c		CSWS
Example 1: Daily Water Budget Method Start after irrigation when the soil moisture profile is full, monitor daily until the maximum allowable deficit (MAD) is reached.													
May 1	110	+	0	+	0	–	4	x	0.75	=	3	=	107
May 2	107	+	0	+	0	–	4.2	x	0.75	=	3.2	=	104
May 3	104	+	10	+	0	–	1	x	0.75	=	0.75	=	110
		+		+									
		+		+									
		+		+									
		+		+									

Even though the total water storage would be (104 + 10 – 0.75) mm = 113 mm, the maximum soil water storage can only be 110 mm. The rest of the water is therefore assumed to be lost due to deep percolation and/or runoff.

Water management

- Equipment required:

Atmometer/ evaporimeter

Rain gauge

Local weather station

Data from observatory

Soil probe/ tensiometer/ moisture sencor

Water management

Water management

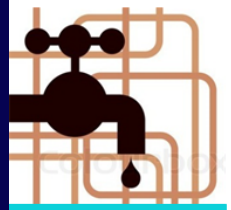
- Water budget satisfies only turf need
- Racing
  - Sometimes more than turf need
  - Soil based tracks
  - Sand based tracks

Refuse ?

Water management

Water balance

Dry season (Oct-Mar)



Fresh water supply 3466

(m³/day)

2240 Stable

1008 (loss 10) Stable cleaning

1120 Horse wash bay

112 Drinking water

520 Cooling tower

Evaporation

10% loss

2480 Sewage treatment station

179 All weather tracks watering

Evaporation

1299 Landscape area irrigation

Evaporation

234 Turf track

Evaporation

250 Equine swimming pool

Lake

246

14 Equine hospital

10% loss

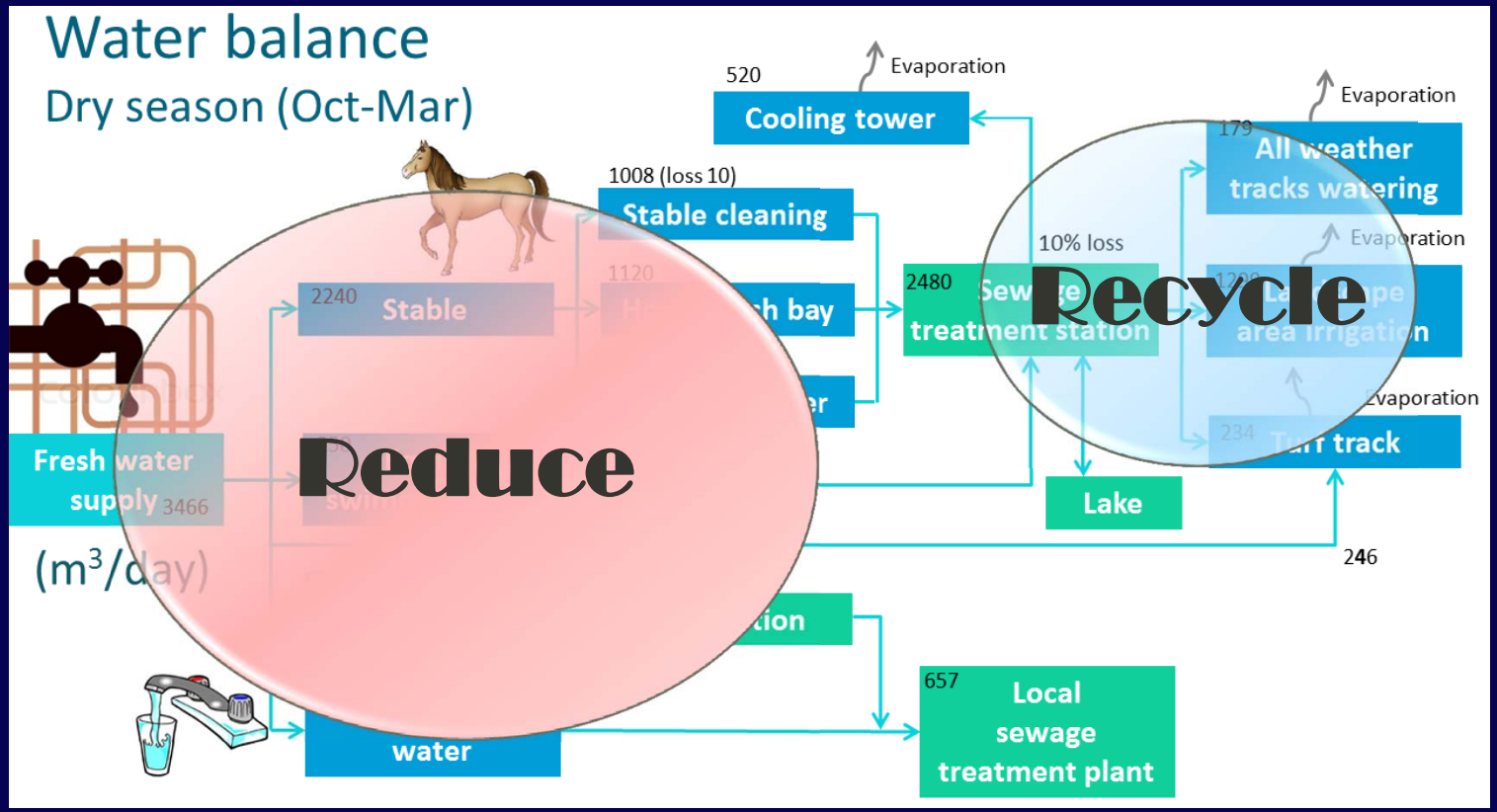
Disinfection

716 Domestic water

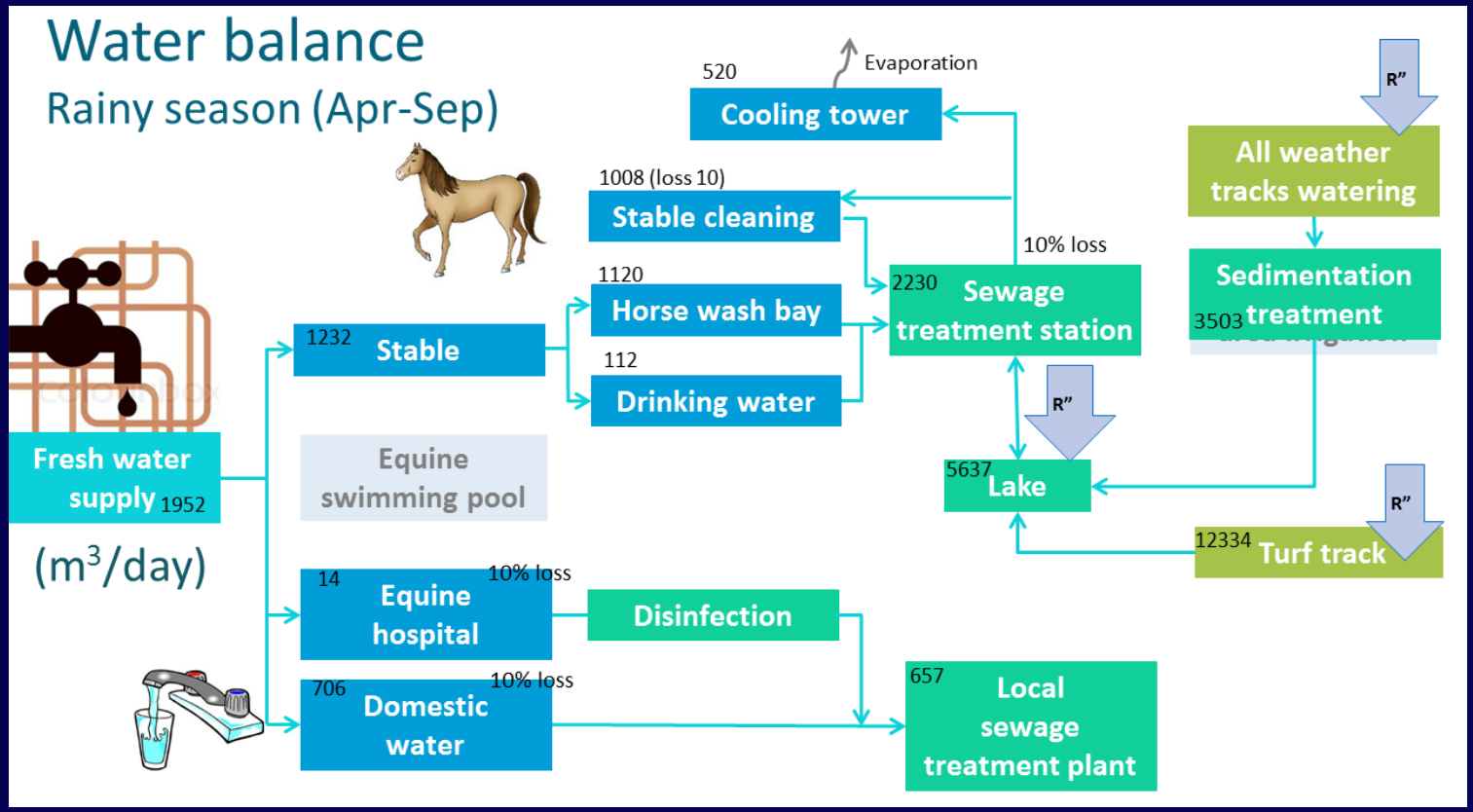
10% loss

657 Local sewage treatment plant

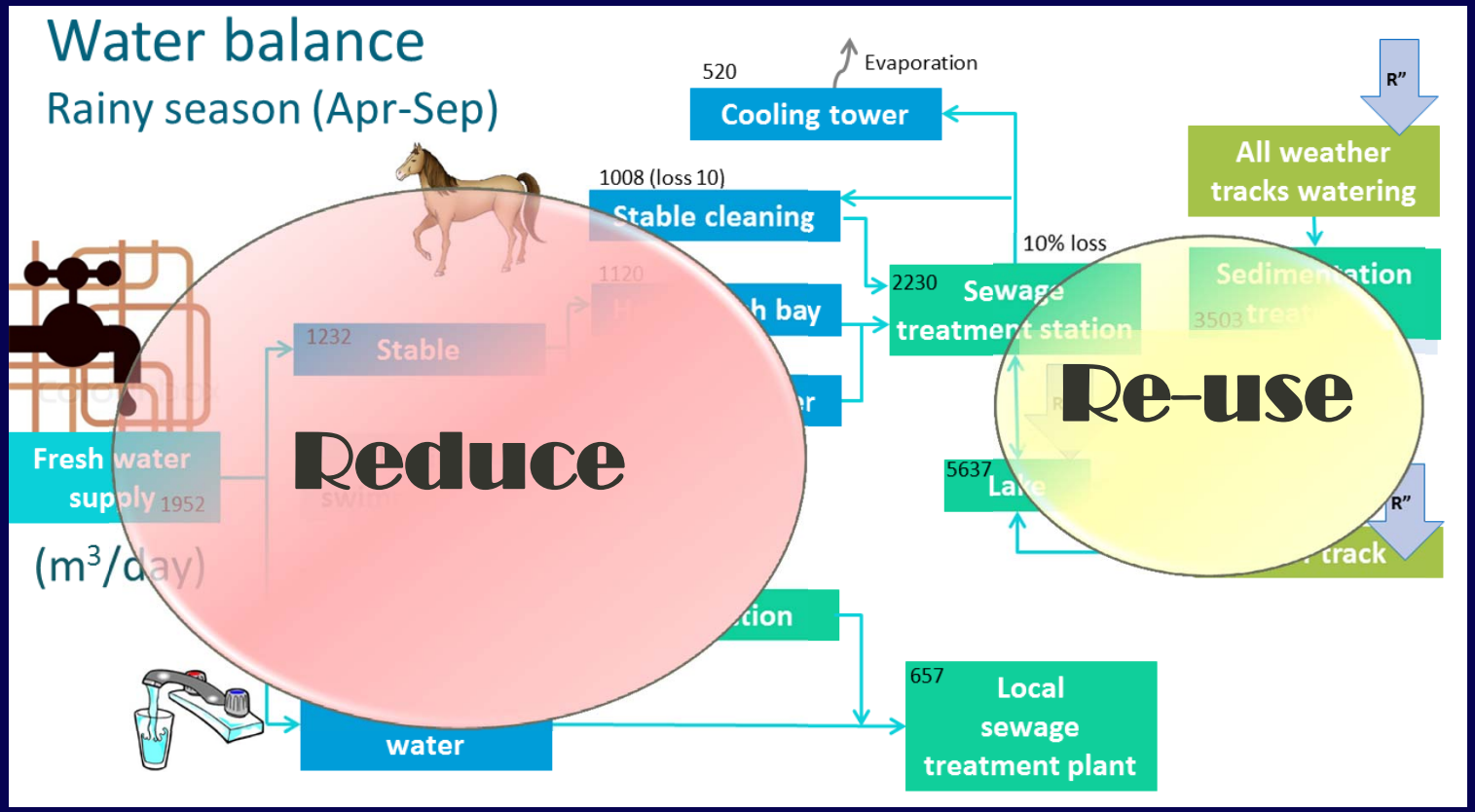
Water management



Water management



Water management



Water management

- Ways forward
  - Rain harvest
  - to reuse the stormwater collected in the underground stormwater storage tank in Happy Valley Racecourse

Re-use

Water management

- Ways forward
  - Treated water
  - To use the water reclaimed at Sha Tin Sewage Treatment Plants, which were
    - Test commissioned in early 2011
    - making use of advanced chemical, biological, filtering and disinfection processes

ENERGY MANAGEMENT

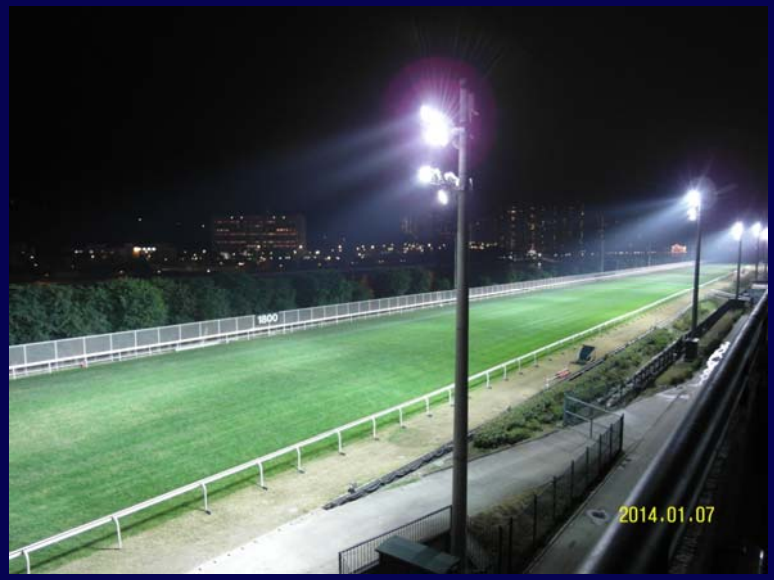
Energy management

- Energy is supplied at a cost
  - Mostly from non-renewable fossil fuels
  - Pollution
- Energy saving
  - Use renewable energy
  - Improve energy efficiency
    - e.g. Floodlight system upgrade

Energy management

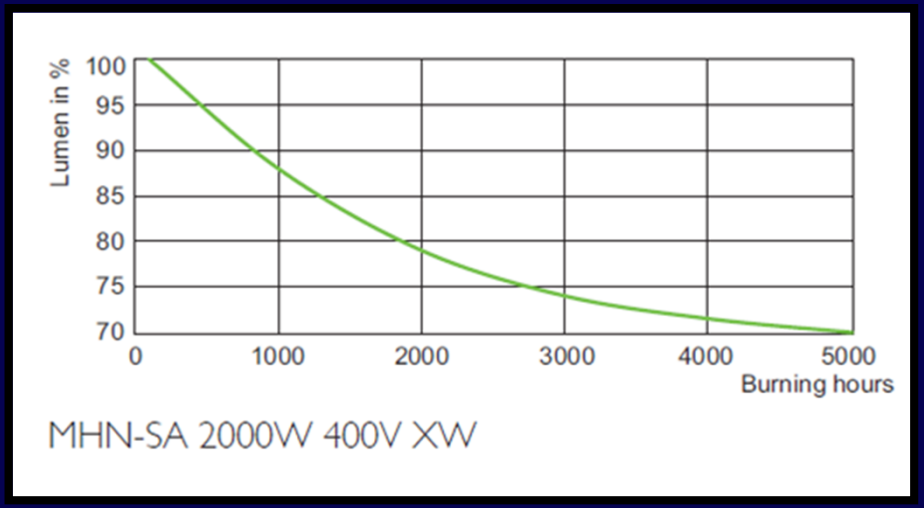
A upgraded track floodlight system
– Sha Tin Racecourse
– Happy Valley Racecourse

Old system	New system
• 1800W lights	• 2000W lights • Control gear: Active reactor



Energy management

- The incorporated control gear, called the Active Reactor
  - the lights can be on full or dimmed
  - operates the lights at constant lumens with excellent energy efficiency
    - the initial provision of 1500 lux level due to maintenance factor



Energy management

Full

Actual race

- 1200 lux (20% lower than initial level)

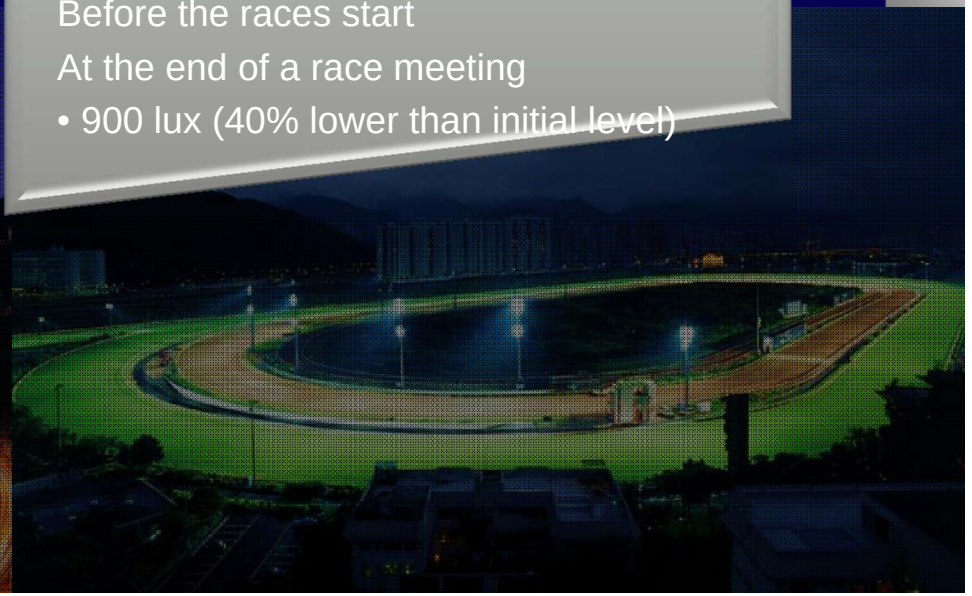
Dimmed

In between races

Before the races start

At the end of a race meeting

- 900 lux (40% lower than initial level)



Energy management

- the modern 2000W floodlights
  + Active Reactor technology
    - the light pollution will be reduced at both racecourses

Night racing at HVRC	65%
Night racing at STRC	70%
Morning Trackwork at STRC	80%

Energy management

- Generators
  - in case of city mains power failure
  - continuous operation means continuous combustion of diesel
- Adopting UPS (Uninterruptible Power Supply)
  - allow the Generators working in stand-by mode
  - Reduced pollutants, e.g. emissions of nitrogen dioxide, particulate matters and carbon monoxide
- Energy saving
  - Consumption of generators fuel v.s CLP supply
  - 30% saving in cost

Energy management

- Systems at HVRC and STRC will achieve 20% and 15% reduction of power supply requirements respectively
  - the amount of CO2 saved per year is about 160 tonnes

MATERIALS MANAGEMENT

Materials management

- Materials sourcing
  - Limited natural resourcing in HK
    - Sand for turf track and all weather tracks
    - Sod
    - Fertilizer/ Pesticide
    - Rail

Materials management

- Re-use sand in AWT
  - Clean the u-channel
  - Store the materials for future topping

Re-use

Materials management

- Recycle Sand for turf track
  - Keep the coring materials
  - Undergo fumigation procedure
  - Mix with pure quartz sand to increase the overall water holding capacity and organic content

Recycle

Materials management

- Lower the carbon footprint by reducing transportation demand
  - purchase in China
    - Fertilizer/ Pesticide
    - Sod
    - Rail

Reduce




Materials management

- Stable waste management
  - Recycle the horse manure
  - Recycle the bedding materials

Recycle

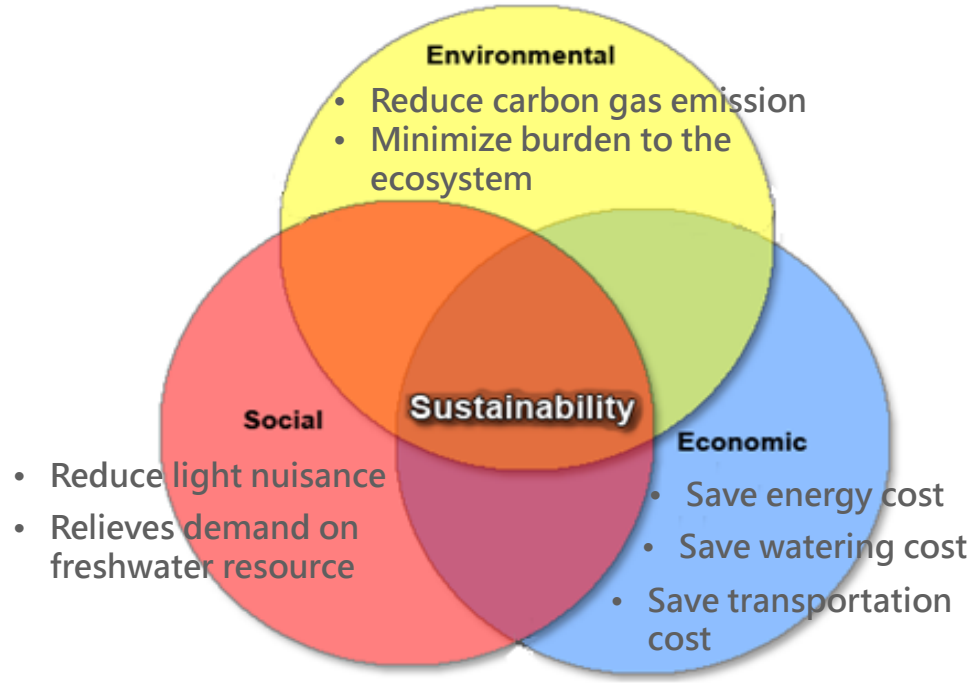
Summary

Energy management

Water management

Materials management

The Three Spheres of Sustainability



Can the racing industry carry out sustainable development?

Who should carry out sustainable development?

What you are building today,

I will be maintaining in 30-years time!

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Thank You !