Examples of major projects with environmental permits:

- Cyberport Development at the Telegraph Bay
- KCRC East Rail Extension From Hung Hom to Tsimshatsui
- Hong Kong Disneyland
- 1800 MW Gas-fired power station
- West Rail Phase I
Avoidance of Environmental Problems at the Planning Stage

- choice of alignment/site
- choice of development type, scale and form
- choice of technology/fuel type
Examples of Avoiding Environmental Problems at the Planning Stage

- HEC’s 1,800 MW Gas-fired Power Station
- KCRC East Rail Extension from Hung Hom to Tsimshatsui
- Improvement to the Lantau North-South Road Link
- Tung Chung and Tai Ho Remaining Developments
- 132kV Power Cable from Po Lam to Tui Min Hoi
- Tang Lung Chau Dangerous Goods Anchorage
At the early planning stage, 17 alternative sites were shortlisted for environmentally sound option:

- Site 1-South Hei Ling Chau
- Site 2-South Sunshine Island
- Site 3-South Tai A Chau
- Site 4-South Siu A Chau
- Site 5-South Shek Kwu Chau
- Site 6-West Lamma
- Site 7-North Cheung Chau
- Site 8-Lung Kwu Tan
- Site 9-North Lantau
- Site 10-Artificial Island, West Lamma Channel
- Site 11-South East Lamma
- Site 12-East Lamma
- Site 13-Western Coastline of D’Aguilar Peninsula
- Site 14-South West Stanley Peninsula
- Site 15-South East Stanley Peninsula
- Site 16-Artificial Island, Bokharo Rocks
- Site 17-Lamma Extension
At the early planning stage, different coal and gas firing technologies identified and evaluated:

**Coal Fired**
- Advanced pulverized Coal-fired (without De-NO<sub>x</sub>)
- Advanced pulverized Coal-fired (with De-NO<sub>x</sub>)
- Integrated gasification combined cycle
- Pressurized fluidized bed combustion
- Circulating fluidized bed combustion

**Gas Fired**
- Combined cycle
- Steam cycle
Alternative Environmental Technology and Facility
HEC’s 1,800MW Gas-fired Power Station at Lamma Extension

Adopting environmentally friendly fuel for new power generation to avoid significant pollutants emission and minimizing reclamation.

Coal Fired with De-Nox Facilities

Gas Fired
<table>
<thead>
<tr>
<th>Event</th>
<th>1998</th>
<th>1999</th>
<th>2000</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Apr</td>
<td>Jun</td>
<td>Aug</td>
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<tr>
<td>Study Brief</td>
<td>🟢</td>
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<td>Review of EIA Report</td>
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<td>Public inspection &amp; ACE Consultation</td>
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<tr>
<td>Approval of EIA report</td>
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<tr>
<td>Issue Environmental Permit</td>
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<tr>
<td>Gazettal (FS&amp;S [Rec] Ordinance)</td>
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<td>(no objection received)</td>
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<tr>
<td>Gazettal (Lamma OZP)</td>
<td></td>
<td>(no objection to HEC project)</td>
<td></td>
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</tbody>
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Avoidance of Adverse Impact

HEC’s 1,800MW Gas-fired Power Station at Lamma Extension

Performance of Plant Switching from coal-fired units to gas-fired units

- Before Implementation of gas-fired unit
  - NOX & SO2: 6,300,000
  - CO2: 20,500

- After Implementation of gas-fired units
  - NOX & SO2: 11,400,000
  - CO2: 18,426
Avoidance of Adverse Impact

KCRC East Rail Extension from Hung Hom to Tsimshatsui

100 year old Signal Hill and its Tower saved

The polygonal Edwardian - Style Signal Hill Tower was erected in 1907 to house the time-ball apparatus. It helped bring a western standard of time to a Chinese society that used the traditional timing system.
Avoidance of Adverse Impact
Lantau North-South Road Link

Ecological Important Habitats at Tai Ho and Mui Wo Saved

- Tai Ho Stream (supporting 46 freshwater species) preserved
- Tai Ho Bay Ecosystem (mangrove, seagrass, and mudflat) protected
- Widening of existing Tung Chung Road now being considered
- Lin Fa Shan mature natural woodland preserved
- Luk Tei Tong Marshland protected
- Alignment Rejected during the EIA Process
Avoidance of Adverse Impact
Tung Chung and Tai Ho Developments

Tai Ho Bay Ecosystem was saved from the proposed reclamation

The Sites of Special Scientific Interest (SSSI) ecological area is protected by eliminating this reclamation in Tai Ho Bay
Avoidance of Adverse Impacts

132kV Power Cable from Po Lam to Tui Min Hoi

Rare and protected plants at Ho Chung were carefully conserved
Minimization of Impact
Tang Lung Chau Dangerous Goods Anchorage

- Preserved 1 km of natural coastline
- Revised seawall layout to improve water quality performance

facilitate colonization and Seawall design will provide hard substrate to establishment of intertidal and subtidal organisms

Revised layout after hydraulic modeling with improvements to water quality performance and leaving Tang Lung Chau and Ma Wan Island untouched
Incorporation of Measures at the Design Stage

- Design of suitable layout, form and configurations
- Environmental treatment technologies and facilitates
- Built-in protection zones
Examples of Environmental Measures at the Design Stage

- Cyber Port Development
- West Rail Phase 1
- Hong Kong Disneyland
- Decommissioning of Kai Tak International Airport
Minimization and Control of Adverse Environmental Impact
Cyber Port Development

Comprehensive environmental measures incorporated for protecting 6,000 existing and 23,000 future population

Key measures
6,000 existing residents protected

Area: 26 ha
Project Cost: $13 billion
Mitigation Measures: $73 million

- LNRS: 2.2 km
- STW: Screening + CEPT
- Outfall: 300m Long
- Noise Barrier: 2.9 km
- Compensatory Planting: 2.2 ha
Armour rock sloped seawall design was adopted to facilitate recolonization of intertidal and subtidal hard surface assemblages.

6 km long landscaped earth bunds were incorporated in the Theme Park Layout Plan to protect 25,000 and 11,000 residents at Discovery Bay and Peng Chau respectively.

2 km long Natural Coastline preserved by adopting an open drainage channel design.

Ecologically sensitive area will be protected by zoning the Pa Tau Kwu Headland and nearby waters as Conservation Area as recommended by the EIA study.

Comprehensive environmental measures incorporated into the Theme Park development project which will create over 20,000 employment and attract 20 million visitors per year.

Minimization and Control of Adverse Environmental Impact
Hong Kong Disneyland
Environmentally acceptable decontamination methods protect some 150,000 existing population and over 100,000 future population.

With the appropriate decontamination methods identified through the EIA process, the existing population in the vicinity of the KaiTak Airport were protected.

The decommissioned project will accommodate over 100,000 population at the clean-up site.
Environmental Treatment Technology and Facilities
Kai Tak International Airport Decommissioning

biopile

waste oxidizer
Incorporation of Measures during the Construction Stage

- Phasing of reclamation/works
- Minimize pollution using silt curtain
- Minimize noise impact using noise barrier/acoustic cover
- Environmental monitoring and audit
Examples of Environmental Measures to Minimize Impacts During Construction

- Pak Shak Kok Reclamation
- Dredging at Cheung Sha Wan Fish Culture Zone
- HEC’s 1,800 MW Gas-fired Power Station (Lamma Reclamation)
- Cyber Port Development
Reclamation Phasing to minimize suspended solids
Reclamation Phasing to minimize suspended solids
Suspended Solids, Depth-averaged (mid-ebb)  
(October 2001)

Limit Level (21.3mg/l)

Action Level (11.1mg/l)
Minimize SS Dispersion using Silt Curtain
Dredging at Cheung Sha Wan Fish Culture Zone

Silt curtains to protect the 22 ha Fish Culture Zone

22 ha. Fish Culture Zone Protected

Silt Curtains
Minimize SS Dispersion using Silt Curtain
HEC’s 1,800MW Gas-fired Power Station at Lamma Extension

Silt Curtain to protect nearby sensitive receivers
Minimize SS Dispersion using Silt Curtain
HEC’s 1,800MW Gas-fired Power Station at Lamma Extension

Silt Curtain to protect nearby sensitive receivers
Monitoring of Suspended Solids

Suspended Solid (Depth Average) at SR5 for Mid-Flood Tide

- Suspended Solid
- Action Level
- Limit Level

Year 2001
Minimize Noise Emission using Noise Barrier
Northern Access Road at Cyber Port Development

Noise barrier to protect nearby sensitive receivers
Monitoring of Noise

Noise Level at Baguio Villa (President Tower) on 24 Nov 01

Noise Level dB(A)

- Measurement Level
- Limit Level

Time
- 07:30
- 09:00
- 10:30
- 12:00
- 13:30
- 15:00
- 16:30
- 18:00
Minimize Noise Emission using Noise Cover
Northern Access Road at Cyber Port Development

Noise cover to protect nearby sensitive receivers