Citarum River Basin Management
To Support Water Supply Measures for Jakarta and Industrial Areas
Citarum Water Resources System

- Area: 12,000 km²
- Annual rainfall:
  - 2,353 mm/year
  - 80% falls Nov-May
- Citarum River Basin
  - Area: 6,600 km²
  - River length: 270 km
- Interconnected basins:
  - Part of Ciliwung-Cisadane
    - Bekasi
    - Cikarang
  - Upper Jatiluhur area
    - Ciherang/Cilamaya
    - Cigadung, Cijengkol, Ciasem
    - Cipunegara
    - Cilalanang
- Cascade Reservoirs: Saguling, Cirata and Jatiluhur
1. **EXPLOITATION & MAINTENANCE** of water resources infrastructures and hydro-electric power plants

2. **Utilization of water resources and hydro-electric power plants**

3. **WATERSHED MANAGEMENT**: control, develop, and utilize water resources in Citarum River Basin

4. **REHABILITATION** of water resources infrastructures and hydro-electric power plants as well
Citarum river basin status, managed by PJT II

One of the strategic rivers in Indonesia

- 80% of raw water supply for Jakarta is relied on CRB,
- 237,000 ha technically irrigated area within one system,
- DMI water requirements in 10 Kabupaten/Kota,
- Hydro-electric power plants (1,800 MW in total),
- Flood control, etc.
Water resources potential of CRB

Total $\pm$ 12.95 Billion m$^3$/year
Citarum : 6.00 Bm$^3$/year
Other rivers : 6.95 Bm$^3$/year

Regulated 7.65 x 10$^9$ m$^3$/year
Equal to 59.07%
From Citarum: 6.00 x 10$^9$ m$^3$/year (all utilized for HEPP)
From others: 1.65 x 10$^9$ m$^3$/year

Unregulated 5.30 x 10$^9$ m$^3$/year
Equal to 40.03%
Infrastructure Development of CRB
Ir. H. Djuanda Dam – Jatiluhur, Indonesia

- 105 m height Inclined Core Rockfill Dam
- 1,220 m length.
- Embankment volume of 9.1 x 10^6 m^3.
- An upstream sloping rather thin with highly plastic central clay core, and
- Rockfill shoulders.

1. Diversion structure
2. Downstream cofferdam
3. Upstream cofferdam
4. Main dam
Circular Hydropower Plant

- 6 units: $\sum 187.5$ MW
- Vertical Francis turbine
- Different level of intakes
- An. prod: avg. $880 \times 10^6$ kWh
Operation Pattern of Citarum Cascade Dams

- Saguling
- Cirata
- Jatiluhur
Increasing of Jakarta – West Java water demand & fulfillment stages of Jatiluhur
(Source: Draft POLA Pengelolaan SDA 6 Ci)

<table>
<thead>
<tr>
<th>Predicted Water Demand (l/sec)</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>West Java Province</strong></td>
<td></td>
<td></td>
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<tr>
<td>Kota Bekasi</td>
<td>1,512</td>
<td>3,364</td>
<td>3,364</td>
<td>3,364</td>
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<tr>
<td>Kabupaten Bekasi</td>
<td>1,095</td>
<td>2,767</td>
<td>2,767</td>
<td>2,767</td>
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<tr>
<td>Kabupaten Karawang</td>
<td>360</td>
<td>1,496</td>
<td>1,606</td>
<td>1,761</td>
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<td><strong>DKI Jakarta</strong></td>
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<tr>
<td>Jakarta</td>
<td>16,941</td>
<td>26,100</td>
<td>27,900</td>
<td>30,100</td>
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<tr>
<td><strong>Total</strong></td>
<td>19,908</td>
<td>33,727</td>
<td>35,637</td>
<td>37,992</td>
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<tr>
<td><strong>Increase on 2010 demand</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>13,819</td>
<td>15,729</td>
<td>18,084</td>
<td></td>
</tr>
<tr>
<td><strong>Staging of Jatiluhur Supply</strong></td>
<td>5,000</td>
<td>10,000</td>
<td>15,000</td>
<td></td>
</tr>
<tr>
<td><strong>Remaining Unsatisfied demand</strong></td>
<td>8,819</td>
<td>5,729</td>
<td>3,084</td>
<td></td>
</tr>
</tbody>
</table>
Reservoir Conservation → Land Use Planning

Keterangan:

- **Zona Penyangga Garis Pantai (Sempadan/Greenbelt)**
- **Zona Garis Pantai Danau**
- **Zona Area Perlindungan Daratan Pantai Danau**
- **Zona KJA**
  - KJA 7,98 ha
- **Jalur Hiking Alami (SDFT Tourism)**

Diagram:

- Illustration of reservoir conservation and land use planning with various zones and activities.

Legend:

- Pure Ecotourism
- Light Ecotourism
- Green Tourism
- Adventure Travel
- Nature Tourism

Map:

- Areas marked for various uses such as resorts, nature trails, and educational tourism.
- Key points such as reservoir, lindung, and cultural activities.

Scale and orientation:

- Map includes a scale bar and orientation指示器.
Strategic work plan of the for drinking water supply

- Development of Bekasi and Cibeet syphon
- Rehabilitation and dredging of West Tarum Canal
- Bandung Inter-Basin Transfer
- Banten-Tangerang Inter-Basin Transfer
- Modernization of Irrigation → efficiency of irrigation water
- improves access society in along West Tarum Canal for clean water and sanitation
- Develop SPAM Jatiluhur 1st stage 5000l/sec
- Jatiluhur – Jakarta Pipeline
Fulfillment water demand strategic until 2030
(Source: Draft POLA Pengelolaan SDA 6 Ci)
Current water supply of 14,000 l/sec is inadequate for current demand

Demand predicted to double by 2023 to 30,000 l/sec

Water security and pollution from West Tarum Canal (WTC) is a concern

Scheme to provide 15,000 l/sec of treated bulk water over 15 years and 3 stages

First stage 5000l/sec from Bekasi to Jakarta

2 x 5,000 l/sec through 78 km, 1.8m diameter pipe per stage

Piped supply offers security and quality improvements

Delivery locations: PDAM Kab. Karawang, PDAM Kab. Bekasi, PDAM Tirta Patriot Kota Bekasi, Aetra (DKI Jaya) and PALYJA (DKI Jaya)
Bekasi Water Treatment 5000 l/sec
Bekasi WTP

Technical Specifications:

A. Intake
   - Bearer channels; 2 x 4,450 Liter/detik
   - Trash Track (Coarse Screen); 2 x 4,450 Liter/detik
   - Fine Screen; 2 x 4,450 Liter/detik
   - Intake Pump; 4,450/N x 1,5

B. Pipes Raw Water trasmisi
   - 1 x 4,450 Liter/detik

C. Water Treatment Plant
   - Flash Mix; 1 x 4,450 Liter/detik
   - Flokulasi; 1 x 4,450 Liter/detik
   - Sedimentation; 1 x 4,450 Liter/detik
   - Filter; 1 x 4,450 Liter/detik
   - Reservoir; 1x 3,8000 M³

D. Pump Clean Water Distribution; 4,450/N x 1,5

E. Filter Backwash Sistem
   - Pompa Backwash; 2 Nos
   - Blower; 2 Nos

F. Dosing Sistem
   - Alum/PAC Dosing; 2 Nos
   - Alkalinity Dosing; 2 Nos
The conveyance of treated water from Bekasi to Jakarta
The conveyance of treated water from Bekasi to Jakarta
Overview of project

Perum Jasa Tirta II – Jatiluhur
Jl. Lurah Kawi – 41151 Purwakarta

The conveyance of treated water from Jatiluhur reservoir to Jakarta

Key
- Jatiluhur to Jakarta Pipeline:
- Additional Delivery Pipeline Required:
- Water Treatment Plant Site:
- River Intake Site:

Not to Scale
Jakarta existing water storage & required scheme delivery points
Reservoir levels over 20 year period assuming 2040 conditions

- Planned supplies of 5m³/sec to Bandung and 15m³/sec to West Java & DKI
- By 2040 supply failures every 2 in 3 years
- Below 87.5m level 40% of months
- Max period below 87.5m level is 10 months
## Indicative project costs

<table>
<thead>
<tr>
<th>Element</th>
<th>Capex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission system from Jatiluhur to Buaran</td>
<td>US $ 229m</td>
</tr>
<tr>
<td>Transmission system from Buaran to PALYJA at Muara Karang</td>
<td>US $ 57m</td>
</tr>
<tr>
<td>Transmission system from Buaran to Aetra (provisional sum)</td>
<td>US $ 43m</td>
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<tr>
<td>Raw water intakes (2nr)</td>
<td>US $ 24m</td>
</tr>
<tr>
<td>Water treatment plant (WTP) – process</td>
<td>US $ 85m</td>
</tr>
<tr>
<td>WTP - waste treatment and disposal</td>
<td>US $ 6m</td>
</tr>
<tr>
<td>WTP – general site requirement</td>
<td>US $ 6m</td>
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<tr>
<td>Minor items</td>
<td>US $ 1m</td>
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**SUB TOTAL base construction costs**

US $ 451m

<table>
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<tr>
<th>Element</th>
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<tbody>
<tr>
<td>Engineering contingencies</td>
<td>US $ 68m</td>
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<tr>
<td>Construction preliminaries</td>
<td>US $ 89m</td>
</tr>
<tr>
<td>Detailed design fee</td>
<td>US $ 23m</td>
</tr>
<tr>
<td>Construction management contractor fee</td>
<td>US $ 32m</td>
</tr>
</tbody>
</table>

**SUB TOTAL project on costs**

US $ 212m

**TOTAL project costs**

US $ 663m

**EXCLUSIONS:** Taxes/fees/permits; investors costs; scheme risk & project contingencies; land acquisition; resettlement compensation; outturn cost factor; Phases 2 and 3.
Indicative timetable

- Pre-feasibility study completion: 31 March 12
- Pre-feasibility study acceptance: end June 12
- Release of EOI: end July 12
- EOI response: end Sept 12
- EOI short listing: end Oct 12
- RFT/draft contract release: Feb 13
- RFT/draft contract response: Oct 13
- RFT evaluation: Nov 13
- Contract execution/financial close: Feb 14
- Construction commencement: Mar 14
- Construction completion: Dec 15
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Thank you for listening