Decarbonizing the Water Sector

Challenges and Opportunities for Private Sector

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Opportunities & Challenges

- More and more private sector companies are reinforcing their commitments for reducing GHG emissions. But business priorities vary by:
  - water tariff structure
  - electricity tariff
  - policy incentives
  - ownership

- In addition, resilience became a high priority of cities. Water scarcity is exacerbated by climate change which:
  - alters the seasonality of rainfall
  - intensifies extreme precipitation events
  - heightens the risk of urban flooding
  - makes raw sewage bypass treatment plants and contaminates surface water

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What we have been financing

Non-Revenue Water (NRW) management in water supply through private sector participation

On-site sludge treatment to mitigate methane emissions

Energy efficiency to treat **wastewater for re-use**
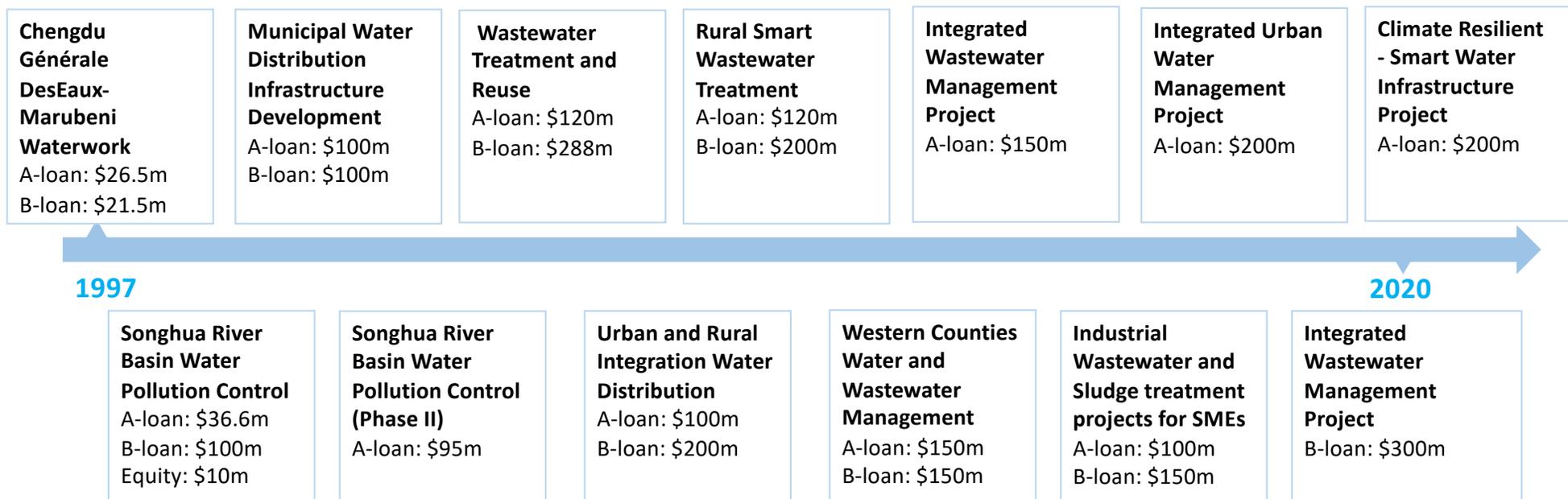
Smart networks

Climate resilient solutions

Climate smart agribusiness

Technical assistance to **"net-zero"** as a partner for our customers' low carbon and resilience strategies.

Example: ADB Private Sector Water Projects in the PRC

Chengdu Générale DesEaux-Marubeni Waterwork
A-loan: $26.5m
B-loan: $21.5m

Municipal Water Distribution Infrastructure Development
A-loan: $100m
B-loan: $100m

Wastewater Treatment and Reuse
A-loan: $120m
B-loan: $288m

Rural Smart Wastewater Treatment
A-loan: $120m
B-loan: $200m

Integrated Wastewater Management Project
A-loan: $150m

Integrated Urban Water Management Project
A-loan: $200m

Climate Resilient - Smart Water Infrastructure Project
A-loan: $200m

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Songhua River Basin Water Pollution Control
A-loan: $36.6m
B-loan: $100m
Equity: $10m

Songhua River Basin Water Pollution Control (Phase II)
A-loan: $95m

Urban and Rural Integration Water Distribution
A-loan: $100m
B-loan: $200m

Western Counties Water and Wastewater Management
A-loan: $150m
B-loan: $150m

Industrial Wastewater and Sludge treatment projects for SMEs
A-loan: $100m
B-loan: $150m

Integrated Wastewater Management Project
B-loan: $300m

Smart Water Technology

Smart Water Management is a combination of sensors and instruments, communication network, and data processing, to make a water network respond to real-time data:

Remote sensors to monitor water quantity, quality, and timing for re-chlorination and automatic flushing

Hydraulic modeling with field data to detect network anomalies (pressure and flow), and react quickly to incidents and leakages to improve performance and energy efficiency

Big data to improve water supply and wastewater treatment operations, overall efficiency, and planning for network extension
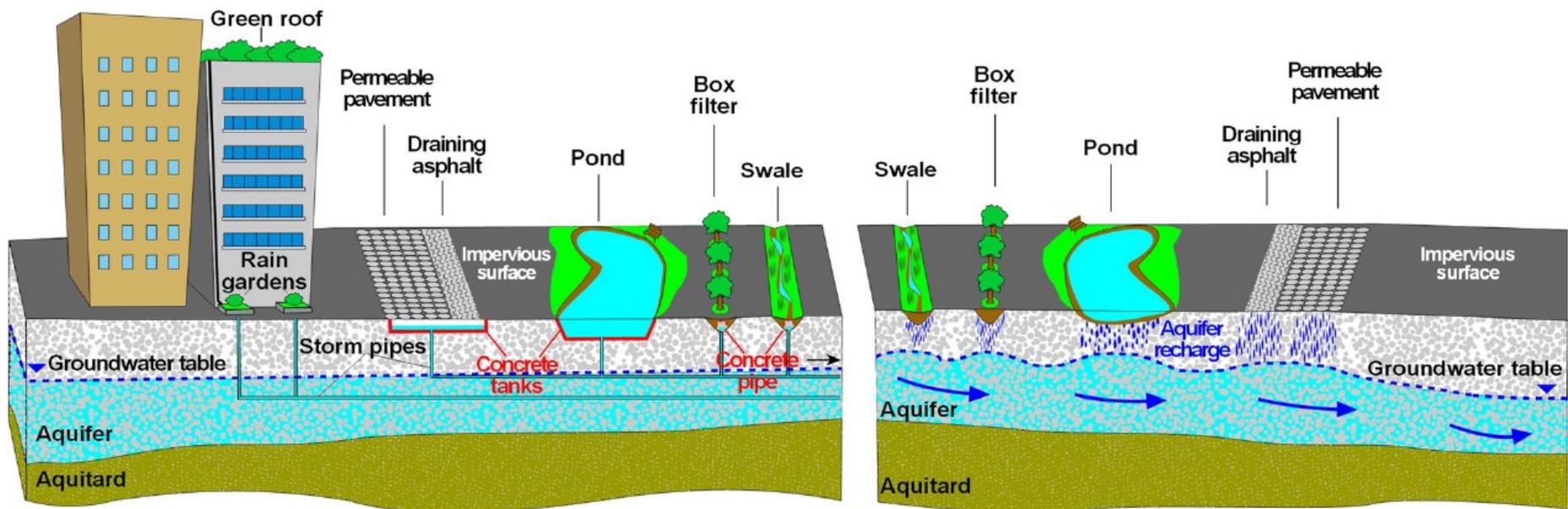
Total online care service for the end-users including online payment and water consumption analysis and virtual service centres to improve customer services

Forecasting and early warning for urban flooding

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Climate-resilient Techniques

(Left) Separated drainage system for storm water collection from sewerage system for wastewater collection. (Right) Aquifer recharge management. Both techniques will absorb urban runoff and enable urban areas to adapt to climate change.

New Momentum

Paris Agreement created a renewed momentum to elevate mitigation & adaptation measures

- Optimizing the spatial development
  - urban-rural integration
  - urban revitalization
  - climate smart irrigation

- End-user water efficiency
  - green building certificates including water efficiency
  - mini-grids for portable water
  - wastewater reuse in business complex
  - Farmers/herders' climate resilience

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Thank you

Appendix 1: Climate-resilient Technologies and Techniques

Structural approach including:

- Enhanced wetlands/constructed wetlands
- Swales
- Permeable paving
- Green roofs
- Filter drains
- Infiltration devices/basins
- Rainwater harvesting
- Retention basins
- Attenuation/detention basins
- Flood protection embankments
- Channel/drainage improvement
- Managed aquifer rechange
- Culverts/canals/drains etc.

Nonstructural approach:

- Flood maps
- Floodplain zoning
- Watershed management
- Flood forecasting and warning
  - Sensors and equipment
  - Telemetry/SCADA
  - Flood forecasting and alarm system

Maintenance:

- Dredging/removal of obstructions/silt clearance
- Reopening culverts etc.

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Appendix 2: Smart Water Technology Application

Process monitoring and control including:

- Smart metering systems
- Communication technologies for field stations (such as sigFox, LoRa, Weightless, Nwave and others)
- Network inspection and leak detection
- Sensors and equipment for ecological monitoring
- Monitoring of water network etc.

Data analytics and numerical modeling:

- Visualization tools (SCADA, GIS)
- Trend analysis and forecasting
- Process-based numerical models (meteorological models, hydrological models, hydraulic and water quality models)
- Water balance and water audit tools
- Software for leak detection etc.

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