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From vision to action
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# Veolia Water Initiatives: The "Octopus" GIS platform to improve water infrastructure efficiency in Pudong, Shangai

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## Short summary

Shanghai is the fastest growing economic region in China and one of the fastest in the world. Since 1992, Shanghai has recorded a double-digit growth almost every year. The total GDP of Shanghai grew from 540 billion Yuan in 2002 to 1.92 trillion Yuan in 2011 – an almost four-fold in less than 10 years. Pudong, Shanghai's dynamic financial and commercial hub, had to cater for this extremely rapid development and ensure water services would support the pace of growth.

One of the main challenges of the Joint-Venture created with Veolia was to overcome the high level of water losses (>35% in early 2000's). Pudong Veolia has developed and implemented a dedicated information system to manage its network, with an advanced GIS centric integrated platform, collecting reliable real-time data from the field. The data analysis results are shared to all staff and workers through Web and mobile platforms. Because of its architecture, the system has been named "The Octopus". Pudong massive permanent vertical and horizontal expansion is now supported by good water infrastructures which, amongst other progresses, have already reduced water losses by more than 10%.

## Key words:

*Integrated PPP, GIS, NRW*

# Issues addressed:

**WASH (inequalities, schools, health centers, refugee camps, women and girls)**

- Social and environmental responsibility
- Training and growth for the employees
- Low tariff of water limiting investments
- Limited health and safety awareness amongst staff
- Need for adapted water services for poor people
- Raising children's awareness in water conservation

**Water resources management (water-use efficiency, integrated water resources management, transboundary cooperation, sustainable extraction and supply of freshwater)**

- The OCW production capacity close to 750 million liters/day (e.g. Increase)
- Fast growing needs and changing environment
- Increasing the supply of water to match population & & economic growth
- Limited knowledge of existing assets
- Water treatment capacity expansion (+28% from 1.25 Mm3/d to 1.6 Mm3/d),
- Implementation of smart technology for network management (GIS, SCADA, Hydraulic Model, traceability, PDA for maintenance)
- New customer services (management system, Call Centre, meters GPS localization and barcodes),
- Minimizing carbon footprint

**Water quality (pollution, dumping of toxic materials, wastewater management, recycling, reuse, restore ecosystems and aquifers)**

- 106 drinking water quality parameters now compliant with intl. standards

# Tools for implementation:

**Technology:** GIS centric integrated platform, to allow:

- An improved understanding of the situation: assets' condition, operational data, historical information capitalization, etc.
- An enhanced data management strategy, providing targeted information, for optimal decision

**Who is involved?**

- Veolia – Chengtou Joint –Venture
- Network Department + Local developer
- Tool implementation & use: most departments include network, maintenance & repair, customer service, production, water quality lab

**What were the objectives of the intervention?**

- Provide a long term enhanced knowledge of assets and operational data.
- Push these data to all operational Departments
- Reduce non-revenue water to sustainable levels

**Implementation challenges:** needs strong management changes to improve data collection from the field and use shared information for daily operation.

**Main task/activities undertaken / Tools used:**

- Development of an ESRI based integrated GIS
- Mobile device deployed for all field works (network & customer service)
- Data collection, dispatch and display centers
- Web services to share compiled information (assets, operational data and analysis results)

**Main outcomes / impacts (what has changed?)**

- Most operation now work with a better understanding of existing site information, targeted tasks assignment
- Comprehensive global analyses are performed for strategic purpose (purchase strategy, maintenance management, renewal plans, etc.)
- Tangible impacts: reduced response time for intervention, reduced water losses, enhanced information/services provided to customers

# Lessons Learned:

**Triggers:**

- Un-matched economic and population growth,
- High water losses
- Unsustainable quantitative & qualitative pressure on China's water resources,

**Drivers:**

- Strategic view and accountability of the municipality
- Growing awareness of customers towards drinking water issues
- Veolia's achievements
- Availability of the IT tools and affordability of local developments

**Barriers**:

- Low water tariff,
- Inherent resistance to technical and management changes,
- Including transition from paper to IT-based tools Interfacing the work of Social Welfare Team with the works

**What has worked well?**

- Contracting a 50 Years JV with Veolia
- Empowerment of local staff within the new Joint-Venture,
- Capacity building of local staff
- Use of local tool development: flexible, fast, affordable
- Smooth deployment of mobile IT devices

**What can be improved?** Faster data quality checking.

**The way forward**:

- Further data analysis to support strategic decision (still need additional historical data collection).
- Keep innovating in the ways each staff can benefits from Web- GIS information and functions.

**Links**:
http://pudongwater.com