



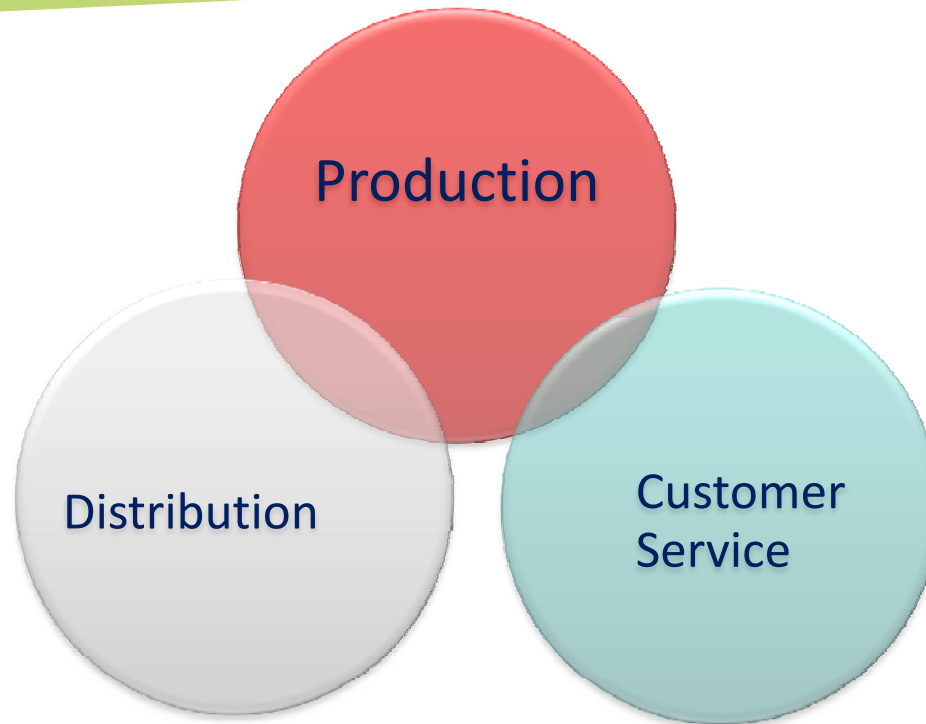
SHANGHAI PUDONG VEOLIA WATER CORPORATION LIMITED

MAY 09, 2014

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Contents of the presentation

- a. General presentation of the company
- b. 2002 – 2013: Improvements



General presentation of the company

-
- Contract
 - Key Facts



Contract

- Partner (50% vs. 50%)



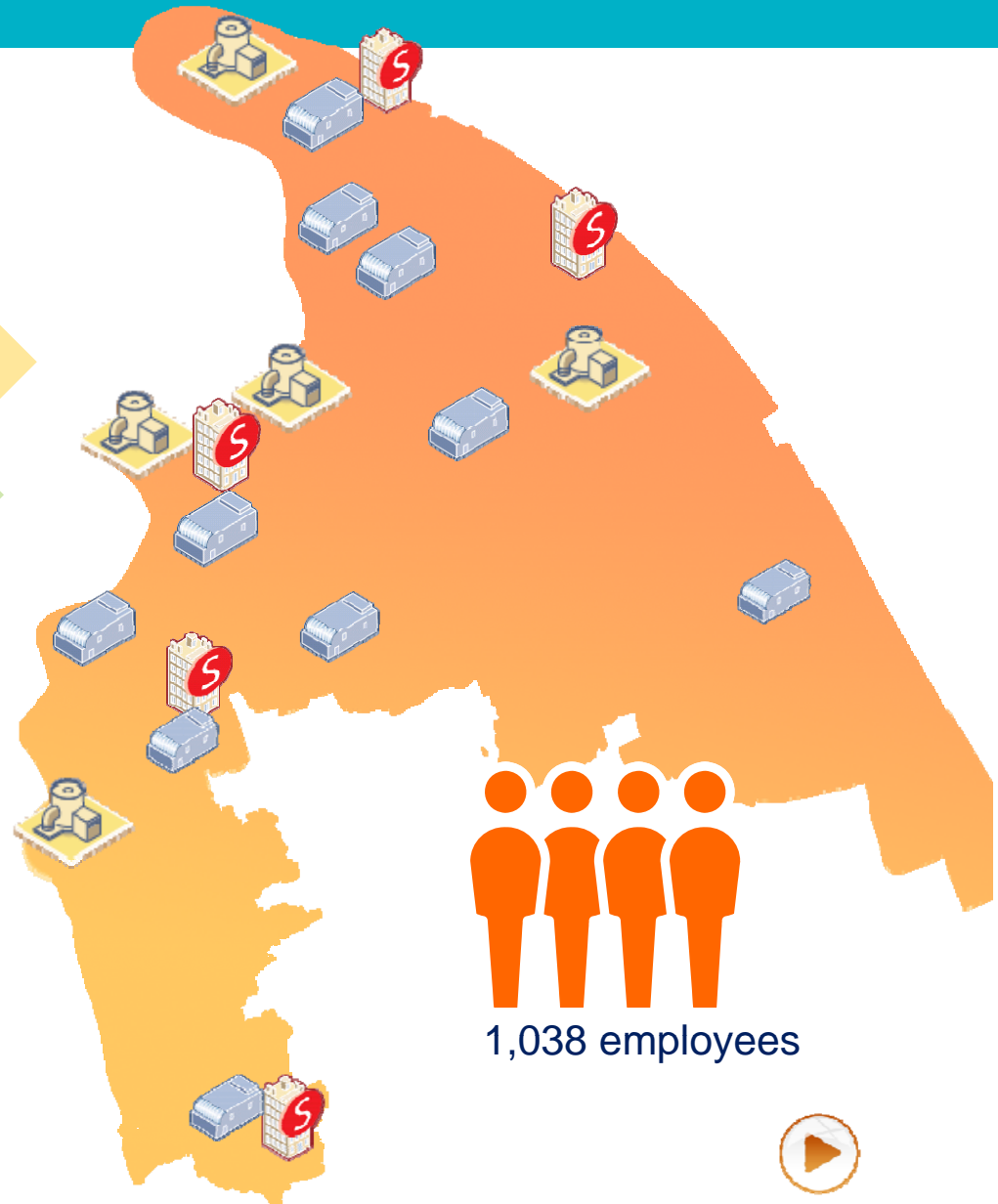
Shanghai Water Assets
Operation and
Development Co., Ltd

Key events

- First time in China invited foreign investor in charge of water production, distribution and customer service
- Legal status from State Owned Enterprises to Sino French Joint Venture
- 50:50 Joint Venture, only 1 in Shanghai

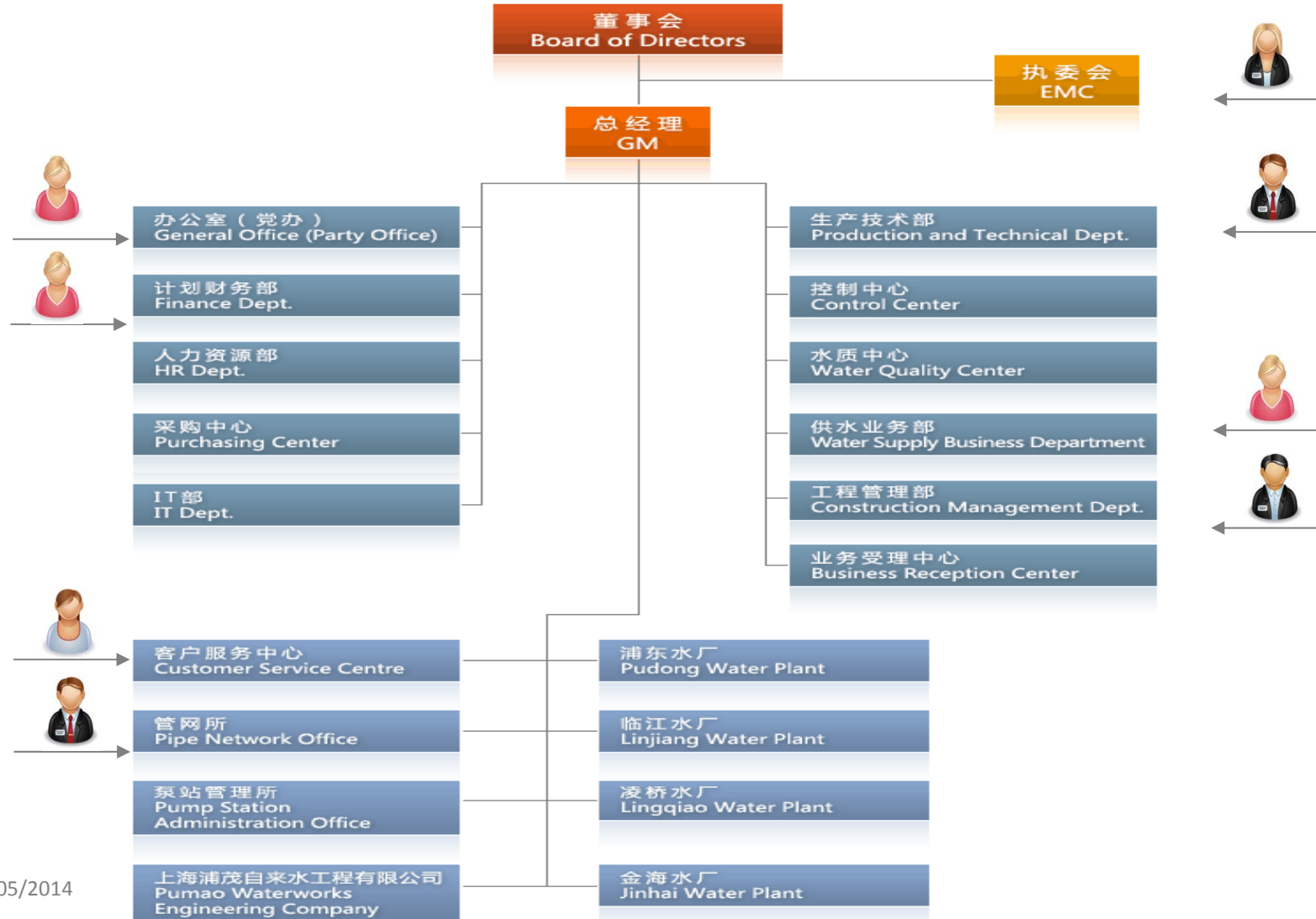
Contract

- 1 Service Area: 672km²
- 2 5 water plants, 9 pumping stations
- 3 Network : 4,624 km (diameter 75mm–1,800 mm)
- 4 Population served: 3.6million
- 5 1,240,907 water meters
- 6 5 agencies
- 7 1,038 employees
- 8 Average daily capacity: 1.60 million m³/day



Contract-decision making

组织结构 Organizational Structure

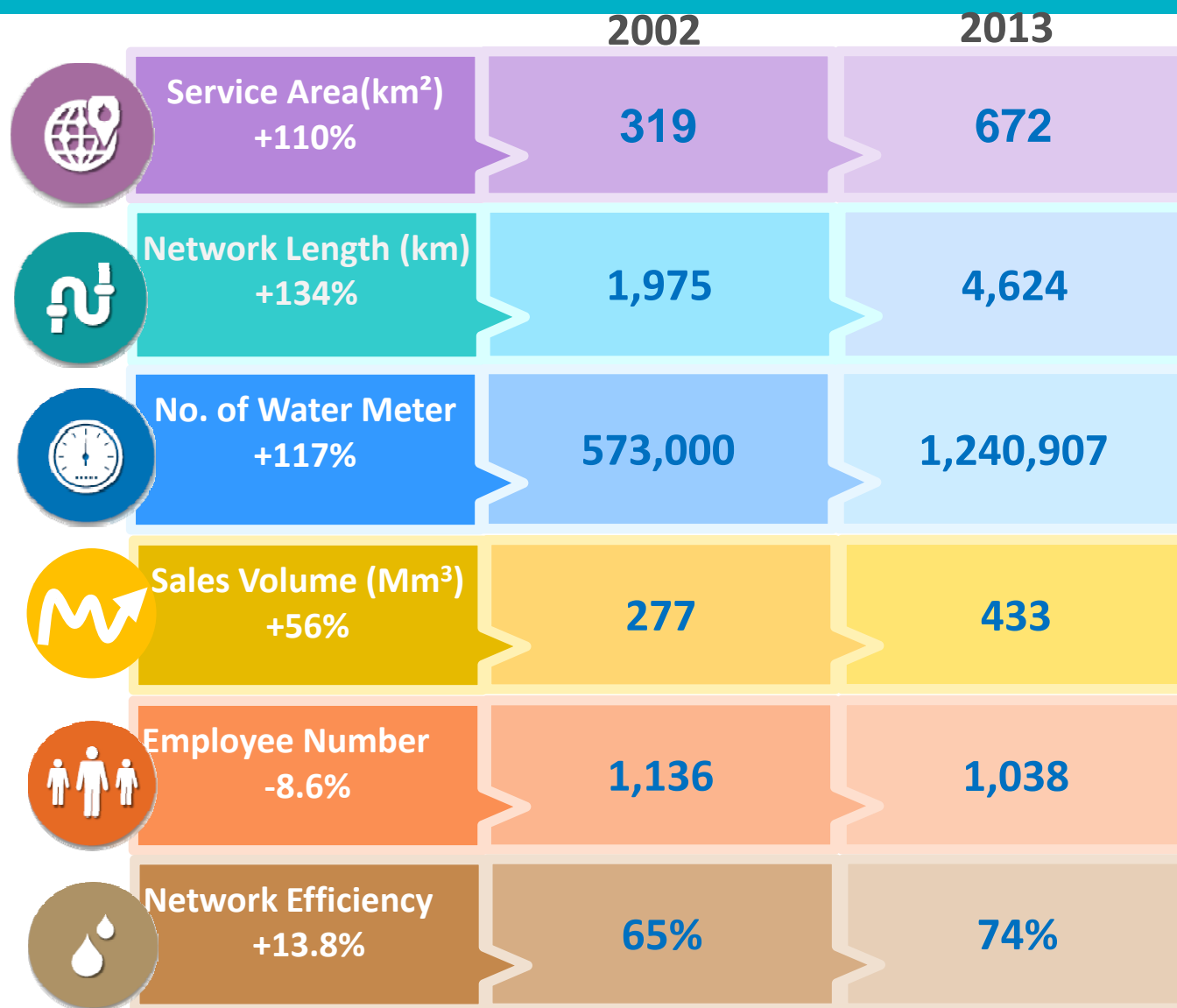


2002 – 2013: Improvements

- Production
- Water quality
- Network and NRW management
- Customer Service
- HR, H&S and Training
- Innovation and initiatives



2002-2013: Growth and Improvements



Production



5 water plants with daily capacity of 1.60 Mm³/d:

Linjiang WP	600,000 m ³ /d
Lingqiao WP	400,000 m ³ /d
Jinhai WP	400,000 m ³ /d
Jujiaqiao WP	100,000 m ³ /d
Lujiazhui WP	100,000 m ³ /d

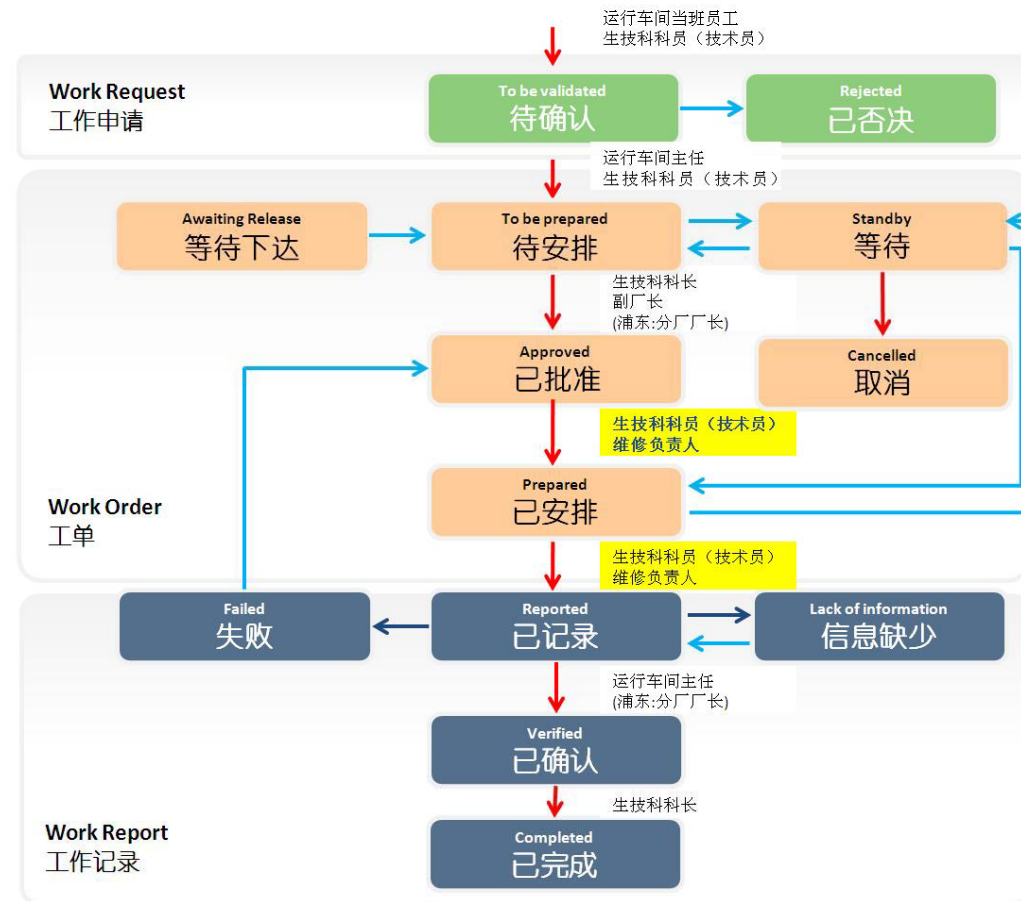
- 28% of additional production capacity from 2002 to 2013

Production – Extension of Linjiang WP



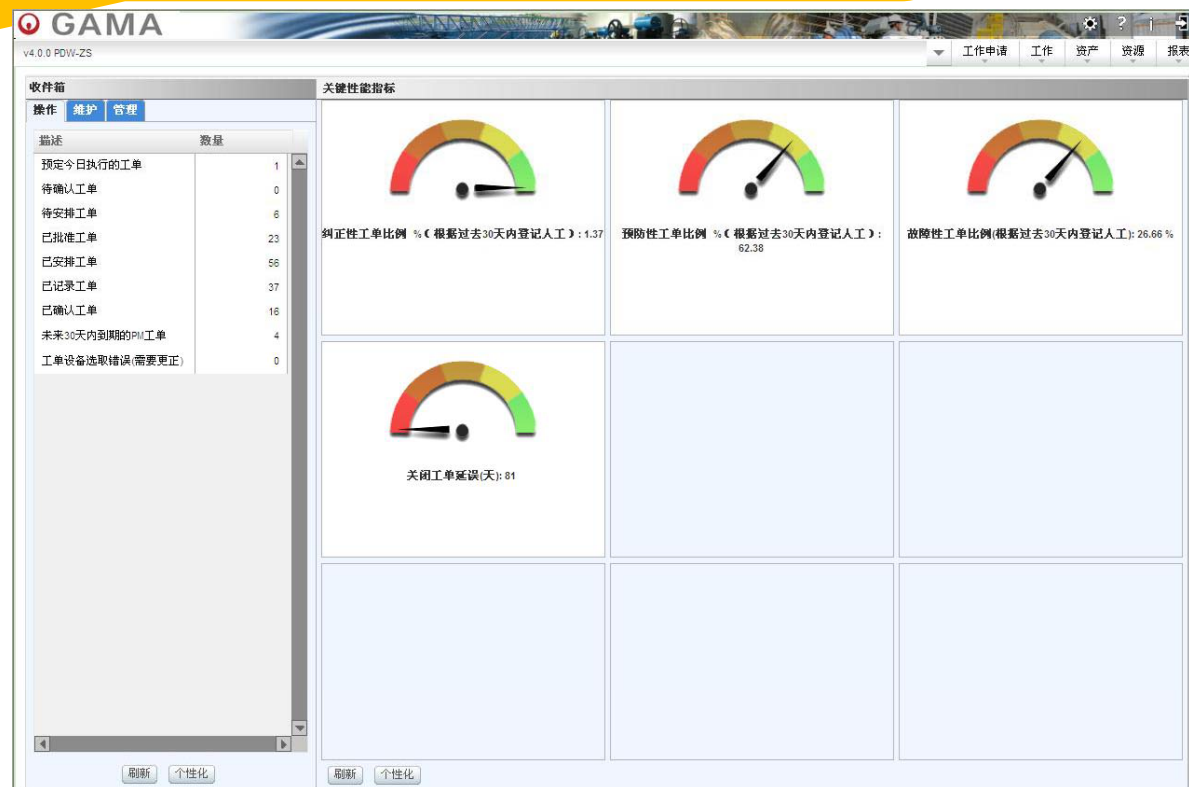
Production – GAMA

- 1、 Identify unified maintenance strategy;
- 2、 Set up assets risk evaluation system;
- 3、 Fix best maintenance decision and improve management level.



Production – GAMA

By the end of December 2013, 893 work orders and 461 precaution maintenance plans have been created in GAMA system. There were 66 online employees and 51 sub contractors, as well as 78 system direct users.



Production – GAMA

Starting from 2014, fixed reporting can be created through GAMA system. With the combination of graphs and data, maintenance situation of each month can be monitored by using of KPI indicators.



Water Quality

Comprehensive compliance with GB5749-2006



Improved average turbidity

- Water Plant - 0.20 NTU in 2002 to 0.06 NTU in 2013
- Network - 0.41 NTU in 2002 to 0.15 NTU in 2013

Manganese compliance improved from 61% in 2002 to 100% in 2013

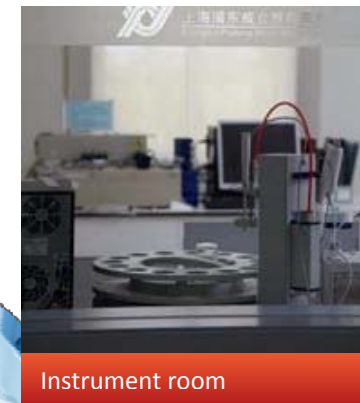
Improved online control in water plants

New raw water intake (Qing Cao Sha) adoption rapidly increase the quality of treated water

Water Quality

- Creation of a first-class Central Laboratory capable of analyzing all parameters of GB5749-2006 regulation
- Self-control plan to survey water quality since 2005
- 2013 : 7,964 samples taken; 140,000 test results per year

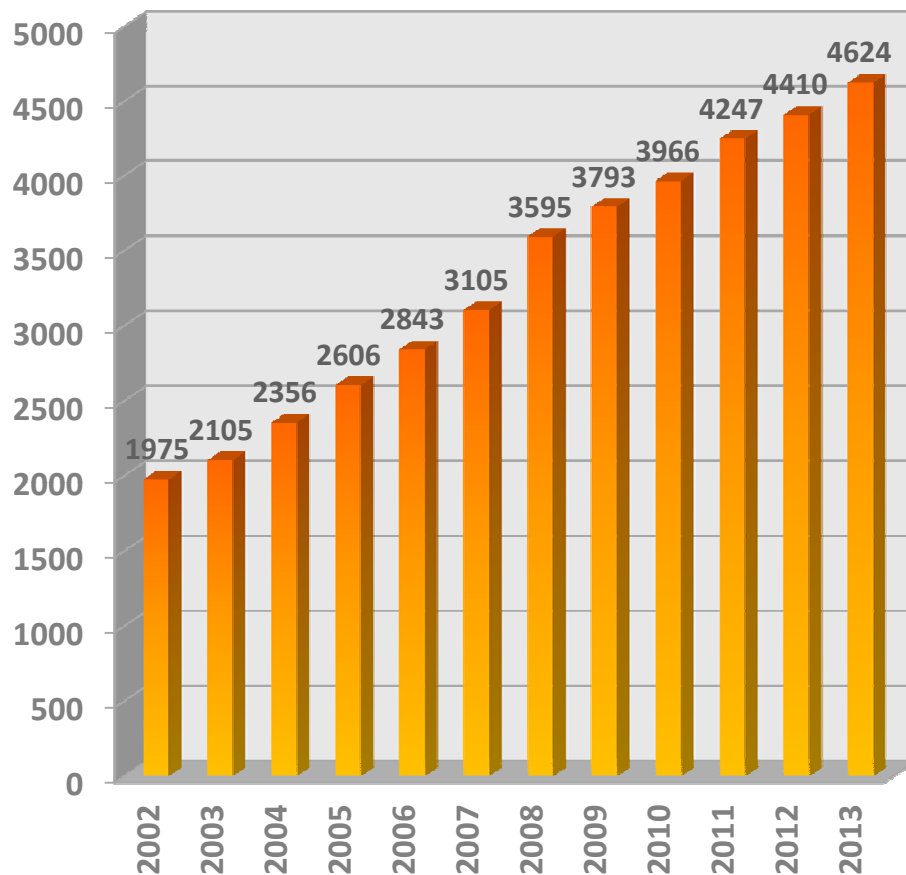
- 134 sampling points and 36 online water quality points in the network
- Follow-up of customers' calls concerning water quality.



Instrument room

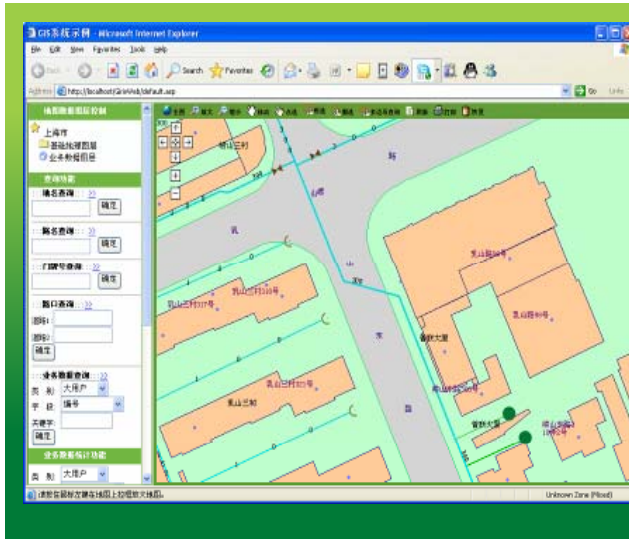
Network Management

Network Length (km)



- Significant expansion of the network
 - 1,975 km in 2002 to 4,624km in 2013
- Development of management tools
- Reduction of Non-Revenue Water
- Integration of Pujiang Town in October 2006
- Gradual integration of Pudong New District from April 2008 and successfully completed in 2013
- + 134% network length

Network Management



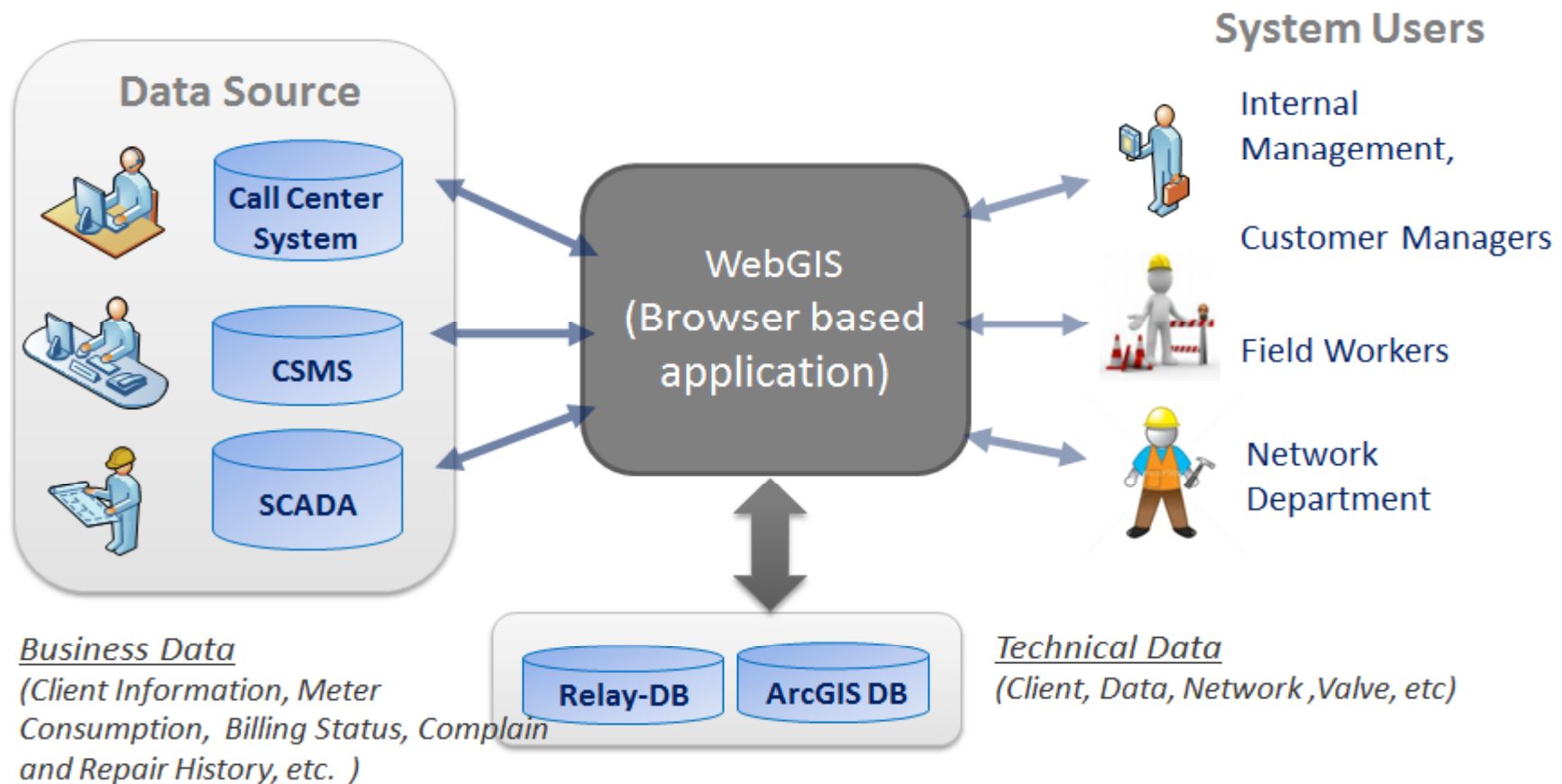
Implementation of Geographic Information System (GIS), upgraded to ARCGIS database of underground assets, events and support for operations:

Pipes, valves, fire hydrants, all meters, pressure points, flow meters, water quality sampling points, leakage repair, water cut-offs, customer complaints...



GIS Upgrade (Key Improvements)

- *New WebGIS system (based on upgrading to ArcGIS) will provide*
 - Dramatically GIS information sharing & using
 - Seamless data integration with other business systems



Network Management

- Pudong GIS system contains the intervention information started from the year of 2000.



Intervention data collection from 2000

Create new intervention sheet in 2006

- From 2006, Pudong has implemented a new intervention sheet to collect more detailed site information.

- Mosare study advised to replace pipes \geq DN300 in 16 sites for 2012 pipe renewal, and 3 breaks would have been avoided by doing so.
- In 2013 network renewal plan, 7 projects were adopted with the use of MOSARE.

Application for 2012 pipe renewal project

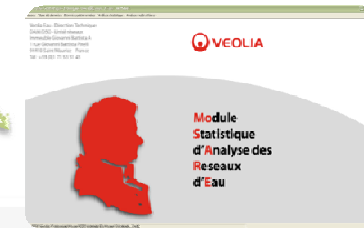
MOSARE application for 2010 Expo project

- a *Network Risk Evaluation* was done by MOSARE for 2010 Expo project

Site No.	Site Name	Site Address	Site Type	Site Size	Site Status	Site Risk	Site Priority	Site Action	Site Date
1	Site 1	Address 1	Type 1	Size 1	Status 1	Risk 1	Priority 1	Action 1	Date 1
2	Site 2	Address 2	Type 2	Size 2	Status 2	Risk 2	Priority 2	Action 2	Date 2
3	Site 3	Address 3	Type 3	Size 3	Status 3	Risk 3	Priority 3	Action 3	Date 3
4	Site 4	Address 4	Type 4	Size 4	Status 4	Risk 4	Priority 4	Action 4	Date 4
5	Site 5	Address 5	Type 5	Size 5	Status 5	Risk 5	Priority 5	Action 5	Date 5
6	Site 6	Address 6	Type 6	Size 6	Status 6	Risk 6	Priority 6	Action 6	Date 6
7	Site 7	Address 7	Type 7	Size 7	Status 7	Risk 7	Priority 7	Action 7	Date 7
8	Site 8	Address 8	Type 8	Size 8	Status 8	Risk 8	Priority 8	Action 8	Date 8
9	Site 9	Address 9	Type 9	Size 9	Status 9	Risk 9	Priority 9	Action 9	Date 9
10	Site 10	Address 10	Type 10	Size 10	Status 10	Risk 10	Priority 10	Action 10	Date 10



Network Management



Criteria will be modified after discuss with our JV people

- This results of analysis has strengthened the confidence of MOSARE implementation in Pudong. (Reports about this pioneer testing has been published on Pudong Water Website)

- From 2006, Pudong has implemented a new intervention sheet to collect more detailed site information.

- In the future, MOSARE will be widely used on the following aspects in Pudong:
 - Pipe renewal proposal
 - Preplan design
 - Cost saving

Mosare has been accepted by our partner gradually

Results of Mosare will be widely used in Pudong JV

MULTI-CRITERIA		WEIGHT	CATEGORIES	MARK
Consequence criteria	Diameter	15	[300, 400]	1
			[500, 999]	3
			[1000, 1800]	5
	Traffic load	30	Low	1
			Medium	3
			High	5
	Estimated repair time	10	3.5h (≤300)	2.7
			4h (≤400)	3.1
			5h (≤500)	3.5
	Number of the customers without water	30	0 - 11	1
12 - 23			2	
24 - 35			3	
Number of the valves to be closed	15	> 30	5	
		3-30	1	
		4 - 6	2	
Opportunity criteria	Pipe corrosion	20	None	1
			Unknown	2
			Weak	3
			Moderate	4
			Grave	5
Total: 100		Total: 100		

Non Revenue Water



- Zoning project, creation 34 hydraulic zones through the installation of 463 electromagnetic flow-meters



Non Revenue Water

1

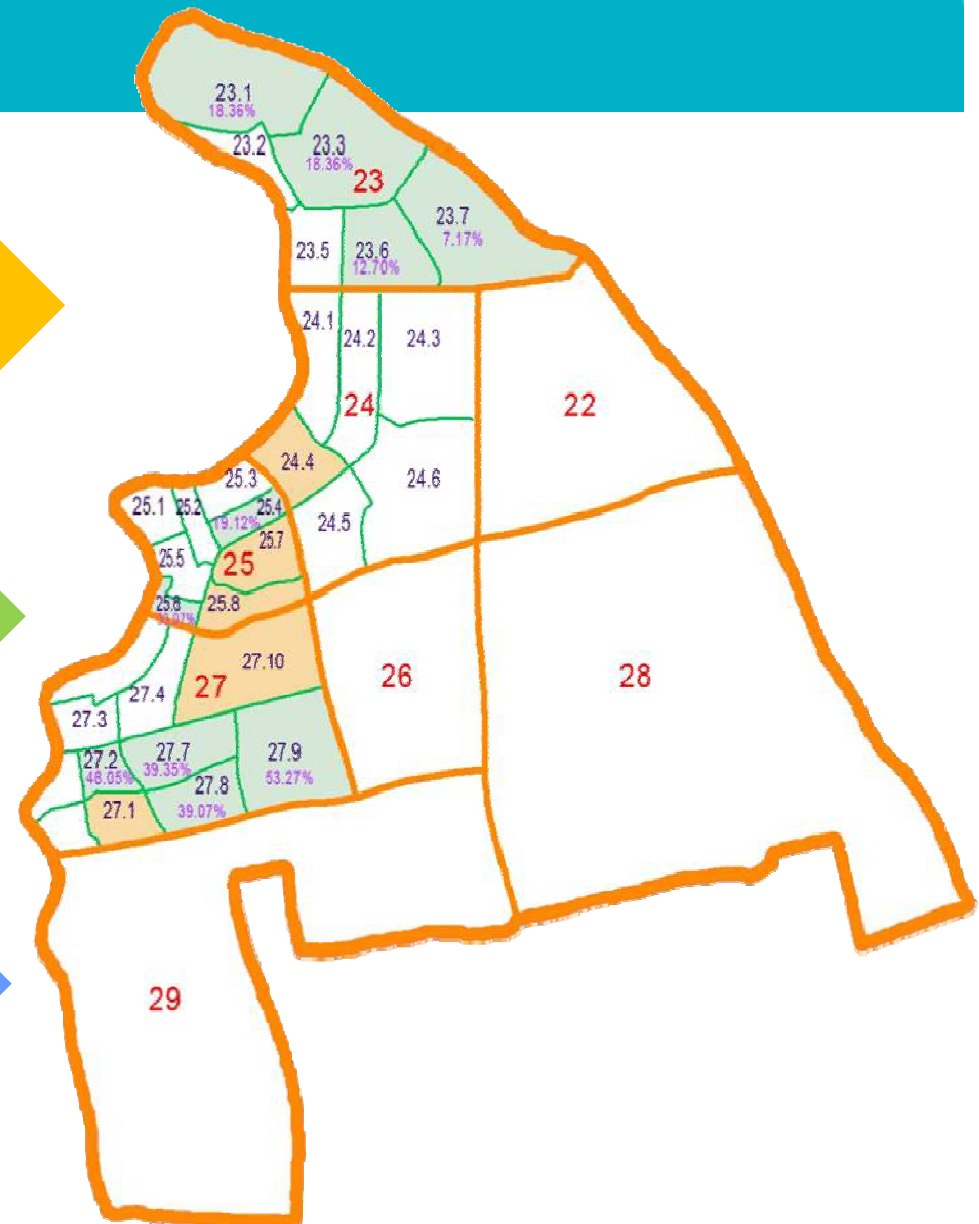
NRW distribution over the network

2

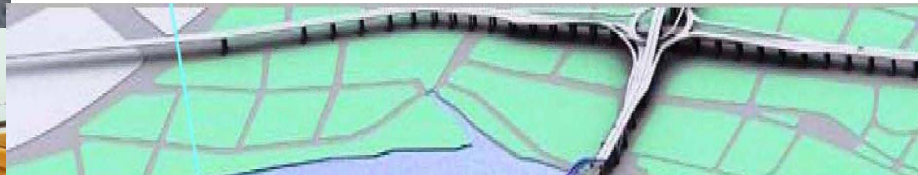
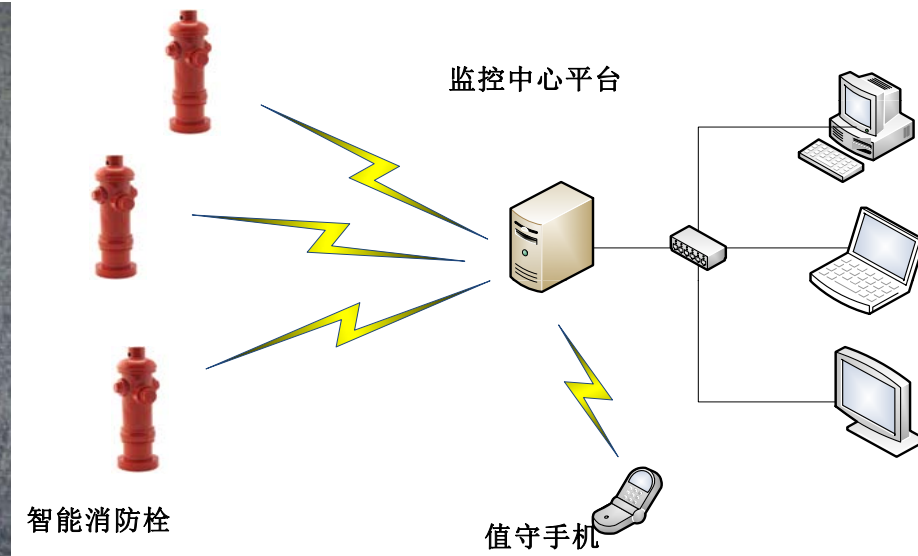
Main reasons of NRW
Meter reading management
Illegal connections
Fire hydrant management
Leakage
...

3

Measures effective
Meter locating by GPS
Lawyer's letter to illegal user
Employee motivation policies



Non Revenue Water





Pilot area



Non Revenue Water

- Implementation of accurate GPS technology

水表表位卡

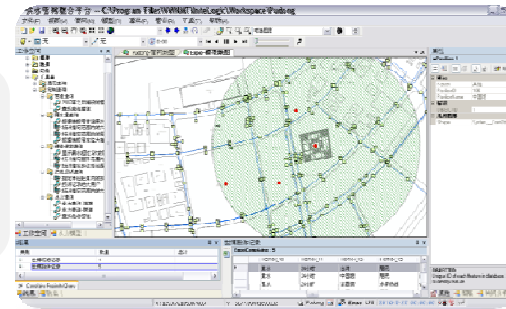
用户名	金阳房产		销根号	980472695
用户地址	张杨路 1667 弄 7 号		口径	40mm
Address & Location Description	表位	门卫口	安装时间	2000.06.06
	表号	5-496	块号	505
GPS Coordinates	坐标点	(6722.401, 367.705)	参考点 1	(6724.901, 367.705) -2.5m
	参考点 2	(6722.401, 385.405) -17.69m	参考点 3	(6735.721, 371.705) -13.32m
表型 <input checked="" type="checkbox"/> 上水 <input type="checkbox"/> 双轮 <input type="checkbox"/> 申水 <input type="checkbox"/> 埃托利 <input type="checkbox"/> 真兰 <input type="checkbox"/> 其它				
背景照片:				
				
Location Picture				
三角线图:				
				
Triangulation Map				
制作日期: 2009/04/02				



Non Revenue Water

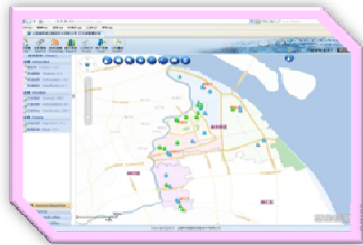
Key Content of PDA Project

- ArcGIS based platform
- Expo experience - INTELOGIC
- Integrated information system



2. GIS Upgrade
(ArcGIS)

PDA
Project



- Reengineer working process
- Improve working efficiency
- Optimize working labor

1. Working Order
Management
System(WOMS)

3. Valve
Management
System (VMS)



- Valve status management
- Water cut-off management
- Valve regular inspection

Non Revenue Water



New Process

Work procedures have been standardized within the Network Department and a new General Dispatcher position has been created to improve the supervision and management of work orders.



New Equipment

On-site personnel are equipped with 94 PDA devices (48 for in-house repair and 46 for pipe repair). Thanks to the advanced 3G wireless and GPS technology, staff are able to obtain GIS maps and send back photos upon completion of their works via PDA.



- *Location: Together with Network and Customer Service Dept.*
- *Function:*
 - *PDA device have the GPS function*
 - *Real time working order creating, dispatching and monitoring*
 - *7x24 field work supervision and resource allocation*
 - *Center for emergency to better coordinate between Networking and Customer Service Dept.*
 - *Analysis and report*

Aquadiag

Aquadiag is a mobile, non-destructive diagnostic technology developed by Veolia Water for underground water networks. One of the biggest advantages of Aquadiag is its ability to assess the operational condition of underground water pipes without disturbance to the streets above and suspension of water supply. This information will enable efficient pipe management, renewal and flushing.

Aquadiag was introduced to Pudong in April 2012 and has been travelling from point to point to perform laboratory tests throughout Pudong. By the end of December 2013, 1121 times of site testing had been done, in which 614 times of road pipeline testing, 262 times of residential pipeline testing, 245 times of special water quality testing and 3 times of CCTV testing.



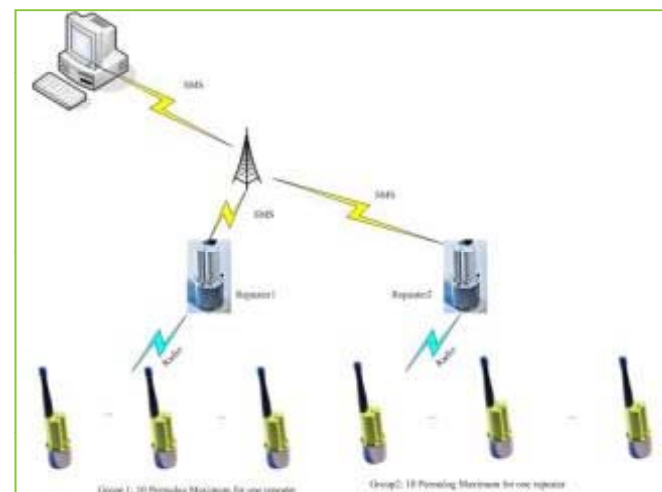
Water samples are taken from fire hydrants, which are connected to the underground pipe networks.



A comprehensive range of parameters are monitored on-site inside Aquadiag.

Non Revenue Water

- Acoustic pre-location (Permalog)
- Leakage detection
- Detection of non-registered connections
- Improvements in metering technology
- Losses index per zone



	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
NRW%	35	33.47	32.89	31.74	29.2	27.5	26.99	24.05	26.47	29.72	28.11	26.41
Loss index (m3/km/day)	-	159.18	148.13	135.46	121.8	101.2	95	83.66	81.9	93.2	81.66	74.82

Control Center

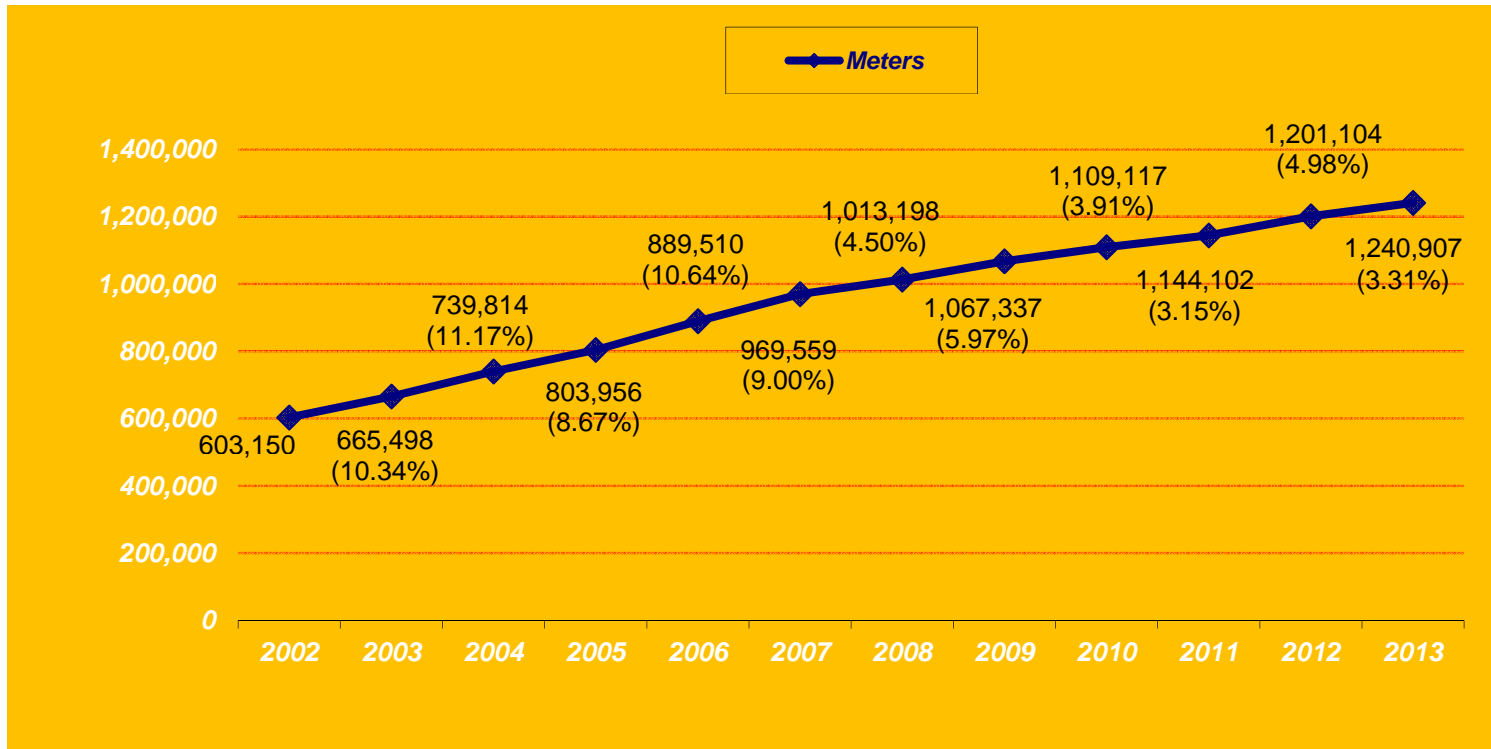


- Water Plant, Pumping Station and 540 network points connected to Control Center via SCADA system
- GIS, Hydraulic Model
- Centralized coordination of operations
- Optimization of operation instructions (reactivity, communication)
- System operating since December 2004
- Integrated information system (EXPO)



View of hydraulic model for Pudong displaying pressure zones

Customer Service



Tap meter: Managed by 5 agencies, agencies also managed small underground meter.

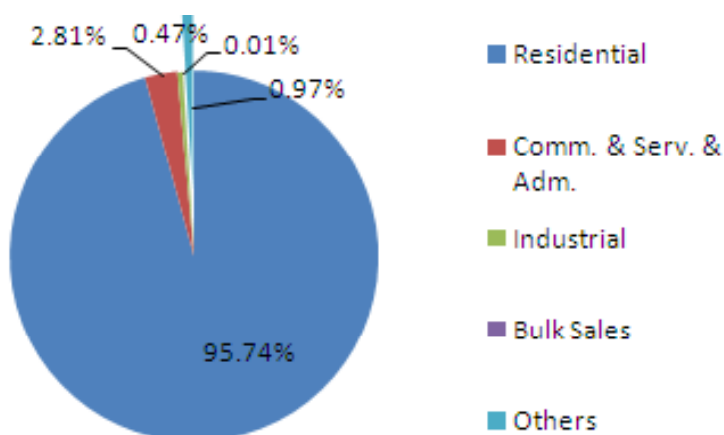
Big customer meter: Diameter ≥ 40 mm underground meter managed by big customer department (around 44% of total consumption)

Customer Service

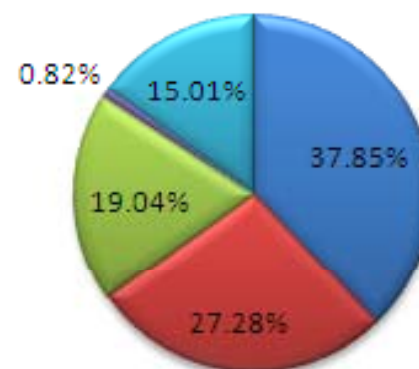
- Water sales in categories

Category (分类)	Meter水表 (%)	Water Sales售水量 (%)
Residential (居民用水)	95.74%	37.85%
Comm. & Serv. & Adm. (行政商业用水)	2.81%	27.28%
Industrial (工业用水)	0.47%	19.04%
Bulk Sales (馈水)	0.01%	0.82%
Others (其他)	0.97%	15.01%
	100%	100%

Water meter



Sales in volume

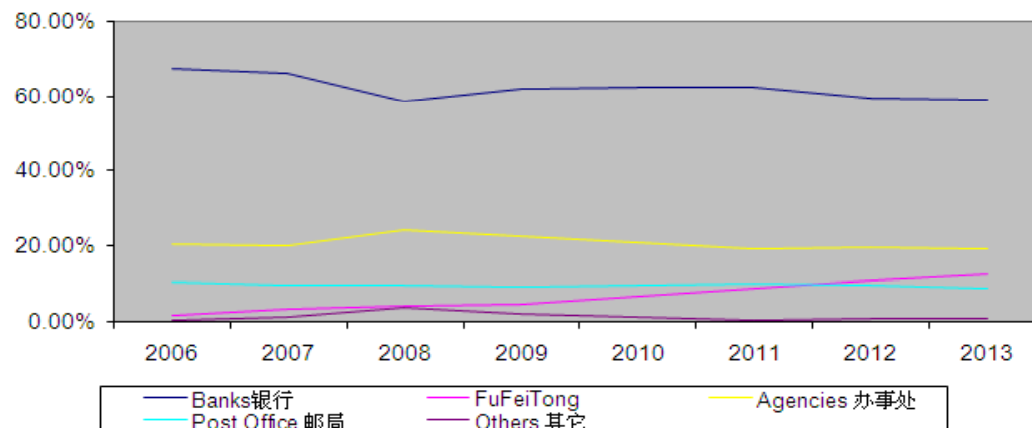


Customer Service

Method of payments

	2006	2007	2008	2009	2010	2011	2012	2013
Banks 银行	67.19%	66.20%	58.51%	61.82%	62.36%	62.42%	59.19%	58.83%
Fu Fei Tong 付费通	1.70%	3.35%	3.98%	4.38%	6.54%	8.56%	10.91%	12.56%
Agencies 办事处	20.44%	19.91%	24.31%	22.63%	20.62%	18.90%	19.51%	19.24%
Post Office 邮局	10.38%	9.52%	9.64%	9.25%	9.47%	9.70%	9.66%	8.63%
Others 其它	0.29%	1.02%	3.56%	1.92%	1.01%	0.42%	0.72%	0.74%

PAYMENTS



Customer Service

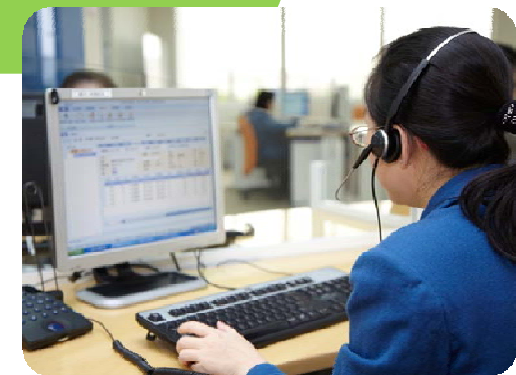
- New means of contacts: SMS, Email, Fax, Letters...
- On line access to the billing system (pop-up screen)
- On line registration of the claims
- Automatic transfer of the Service Order

to the technical team (using new Network)

- Remotes Call Centers in the Agencies
- New statistics and sophisticated tools to monitor the new Call Center

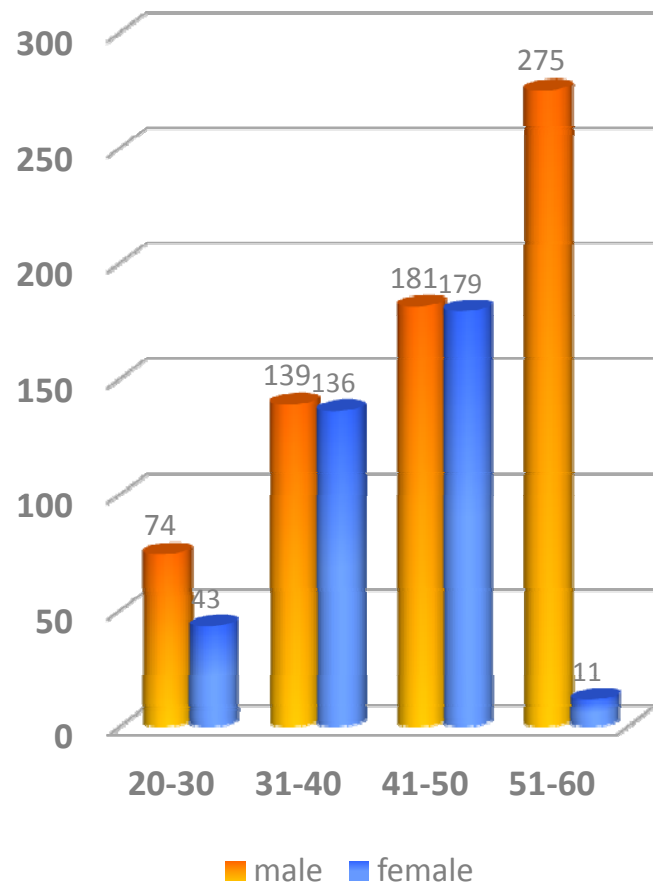
• Call center

- A new call center of 21 positions with 30 employees (7d/7 and 24h/24) opened on 31th December 2004 and was relocated in April 2011. Customers will be allowed to manage more and more operations without coming to our agencies.

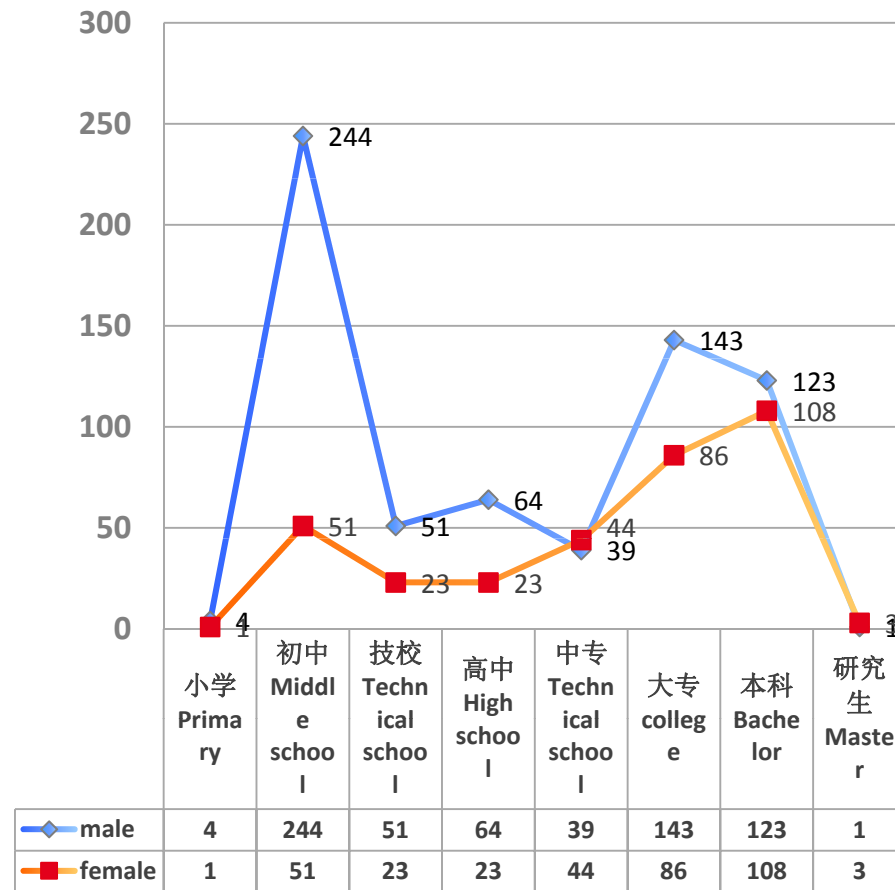


Human Resources – current status

Age



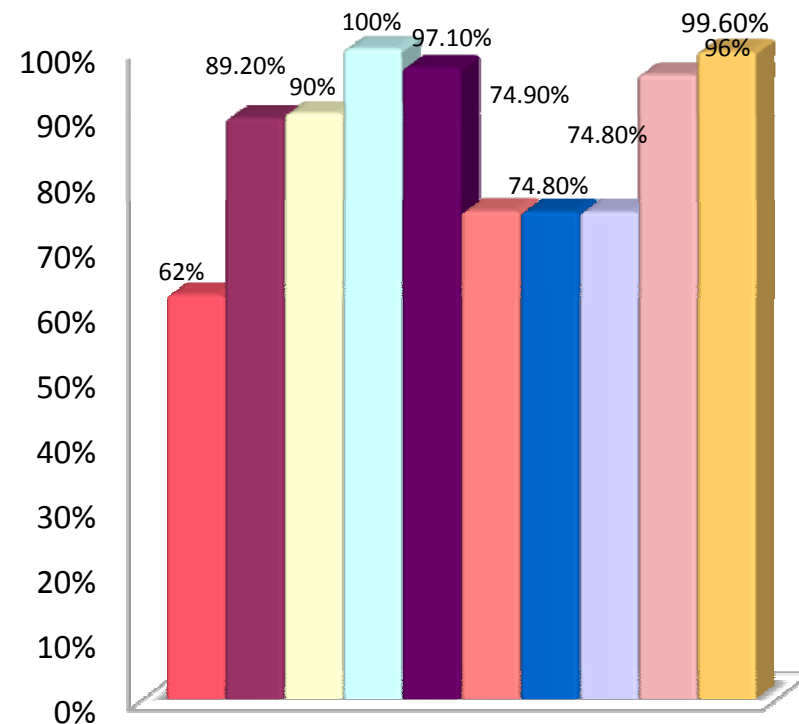
Education



Human Resources - Training

- Launching CBT
- Strong impulse to all trainings: technical, financial, H&S, English, management, IT...
- Target of 100% of the employees being trained
- 24.4hours training /year/employee. 25345 hours of training in 2013
- Trainings organized locally or through VW Asia Pacific

Percentage of trained employees



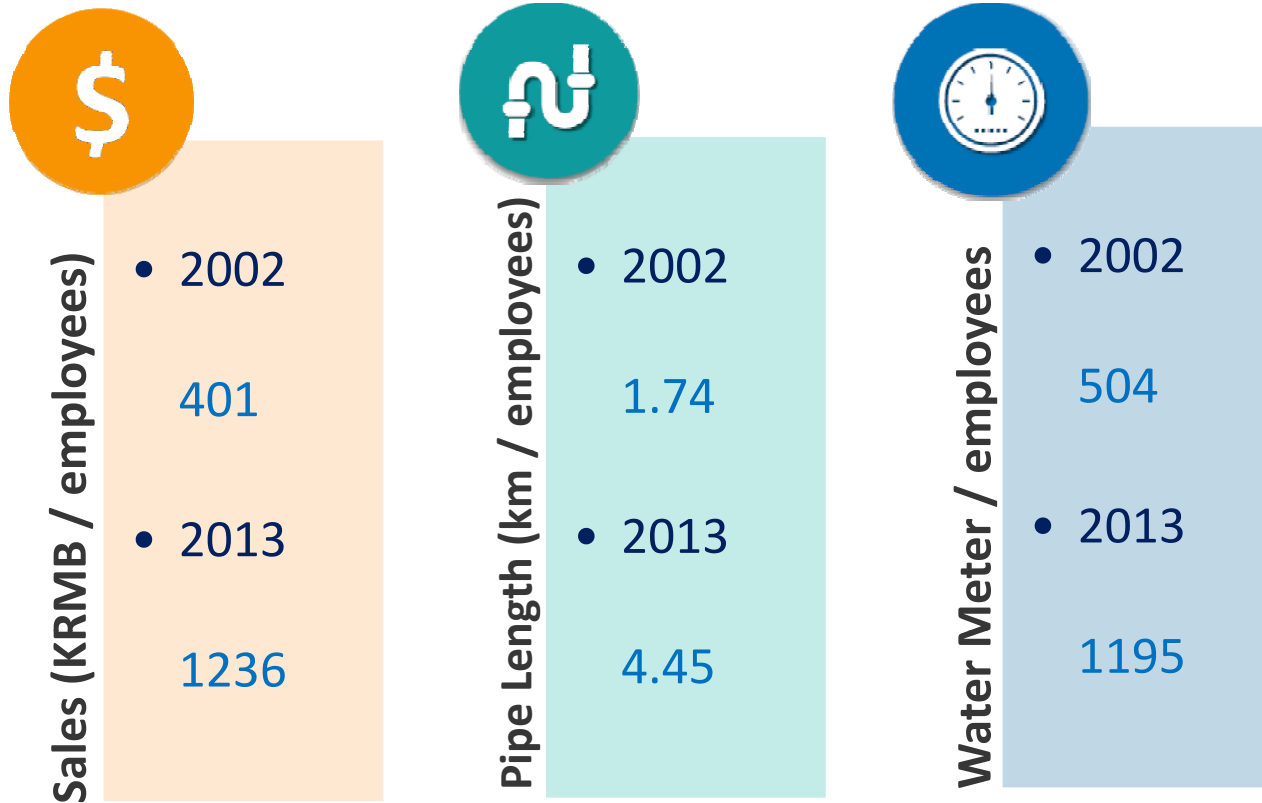
Percentage (trained employees)



Human Resources –Productivity

- 1038 Employees in 2013

Productivity Index



Human Resources - Health & Safety



- General Health and Safety audit carried out in November 2002. Near 200 safety risks detected. An intensive action plan has been implemented.
- Every year, review of conditions and action plan with corrective measures.

- OHSAS18001 (2007) certification:
2004-2013, Linjiang WTP, Linqiao WTP, Pumping Station, Network Office, Customer Service, Pumao Co., Pudong WTP and Jinhai WTP were certified with the international standard for Health and Safety
- In 2013: we organized 5848hours of H&S training.



Innovation



Several initiatives to promote technical progress and innovation have been developed in the last four years:

- Ozonation and Activated Carbon filtering study in cooperation with the College of Environmental Science and Engineering (CESE), Tongji University
- Energy-saving and efficiency-raising projects (in progress)
- Research in Ammonia leakage neutralization technology, in cooperation with Jiaotong University
- Biofilm development in the network, study in cooperation with Tongji University
- Study on the Jujiqiao WTP filtration in cooperation with the CESE, Tongji University
- Carbon footprint calculation, in cooperation with Carbone4
- Computer modeling of water quality evolution in the distribution network

Management Initiatives



Initiatives launched in
2006 with the approval of
Board of Directors:

- Environmental Management System
- Optimization of energy cost
- Working positions study
- IT Safety Plan
- Risk Management Plan
- Crisis Management Plan
- Carbon footprint calculation
- Sustainable development study



Q&A

提问与回答