WE CAN
Reduce NRW
降低产销差，
我们志在必得

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Representation：Leif Koch A/S　Krüger A/S

Leif Koch

KRÜGER VEOLIA

降低产销差

Reduction of Non Revenue Water (NRW)

事实： 丹麦所有水公司的平均产销差为7%

Fact:In Denmark the average NRW % is 7%

饮用水的流失意味着-稀缺资源的流失， 资金的浪费，以及饮用水源卫生隐患

Loss of drinking water means: -loss of scarce resources, -loss of money and -vulnerability to hygienic problems.

科学调查，对症下药，能够实现将产销差控制在长期10%以下

Dedicated work on reducing the volume of Non-Revenue Water can lead to <10% NRW in the long term.

为达成此远大目标， 我们需要怎么做?

To obtain this goal, a number of appropriate solutions must be implemented.

25% 12% 10%

NRW

团队概况
Who We Are

CEO of Leif Koch A/S

Leif Koch A/S 总裁

Jørgen Würtzner Koch

Business Developer of Krüger

Krüger 首席顾问

Søren Carsten Nielsen

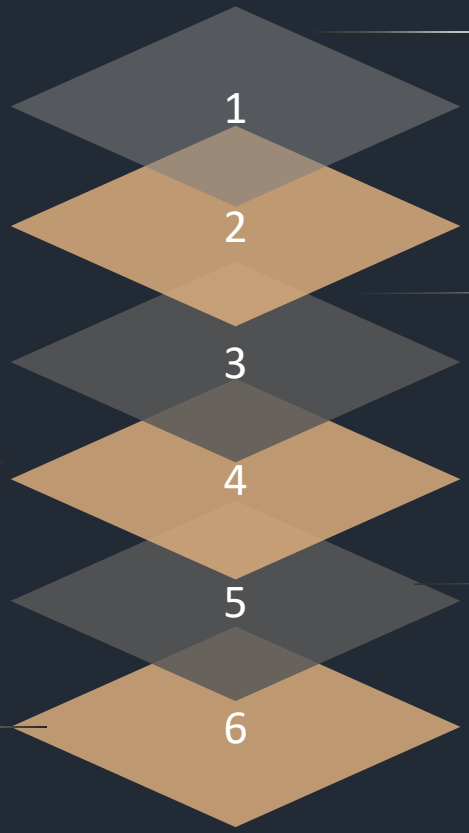
Chief Assistant of Leif Koch A/S

首席助理

Pei Chen
陈沛

降低产销差具体措施

Solutions to reduce NRW



线上跟踪

Online registration

区装表计量

District meter areas (DMA)

渗漏检测

Leakage detection

水压管理

Pressure management

精确计量水表

Accurate consumermeters

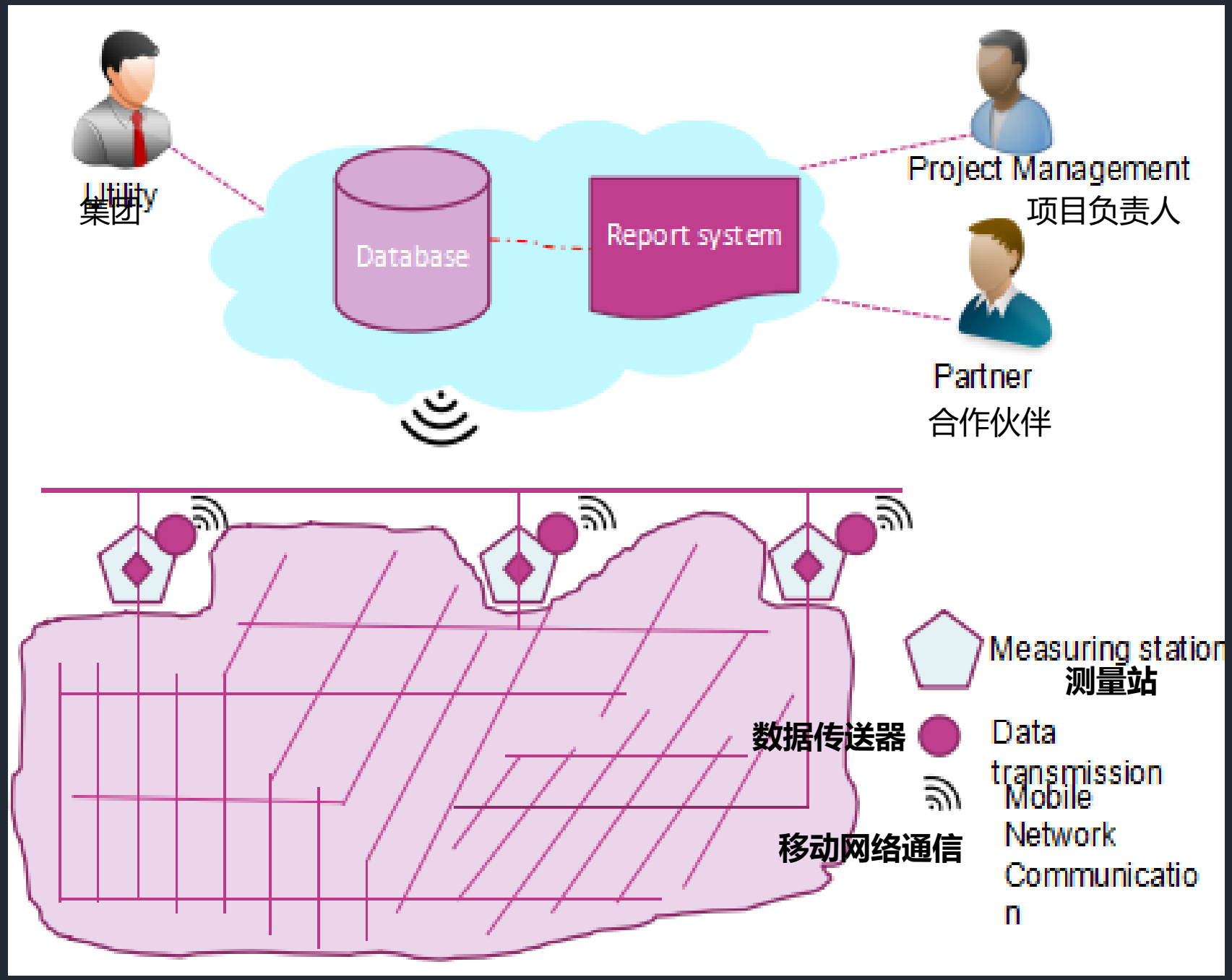
水阀调度

Pump arrangements

1，
线上跟踪
Online registration

Every 5 minutes: 每隔五分钟
- water pressure -水压
- water flow -水流

Every hour: 每小时
- water volume -水流量
- energy consumption -能耗



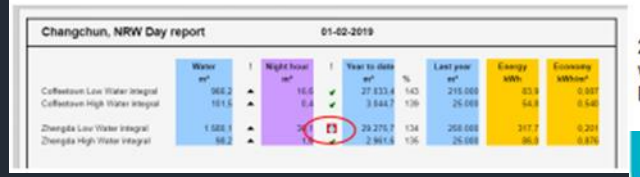
线上数据整合计算

Online data integration and computing

Warning about leakage

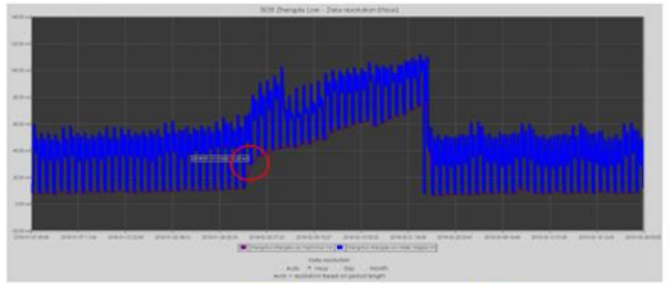
Day Report

1st leakage warning January 31st



2nd leakage warning February 1st

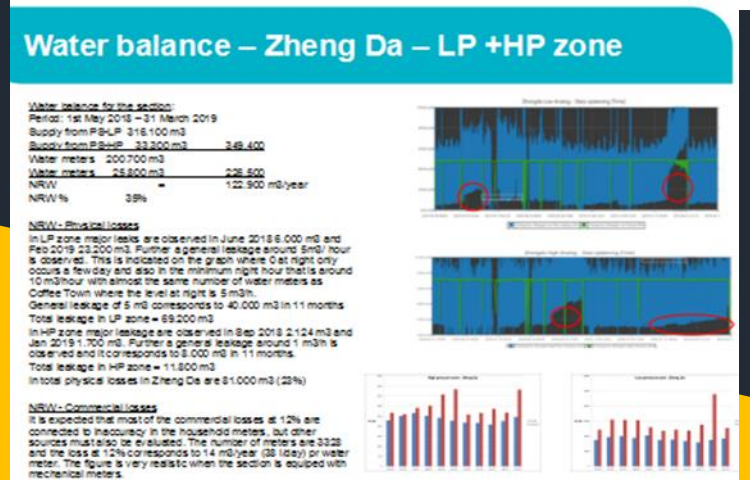
Leakage visible on the graph



Zhenga Low pressure zone: blue Water consumption, purple Minimum nigth hou

Red circle indicates first detection of the leakage on January 31st

Water balance – Zheng Da – LP +HP zone

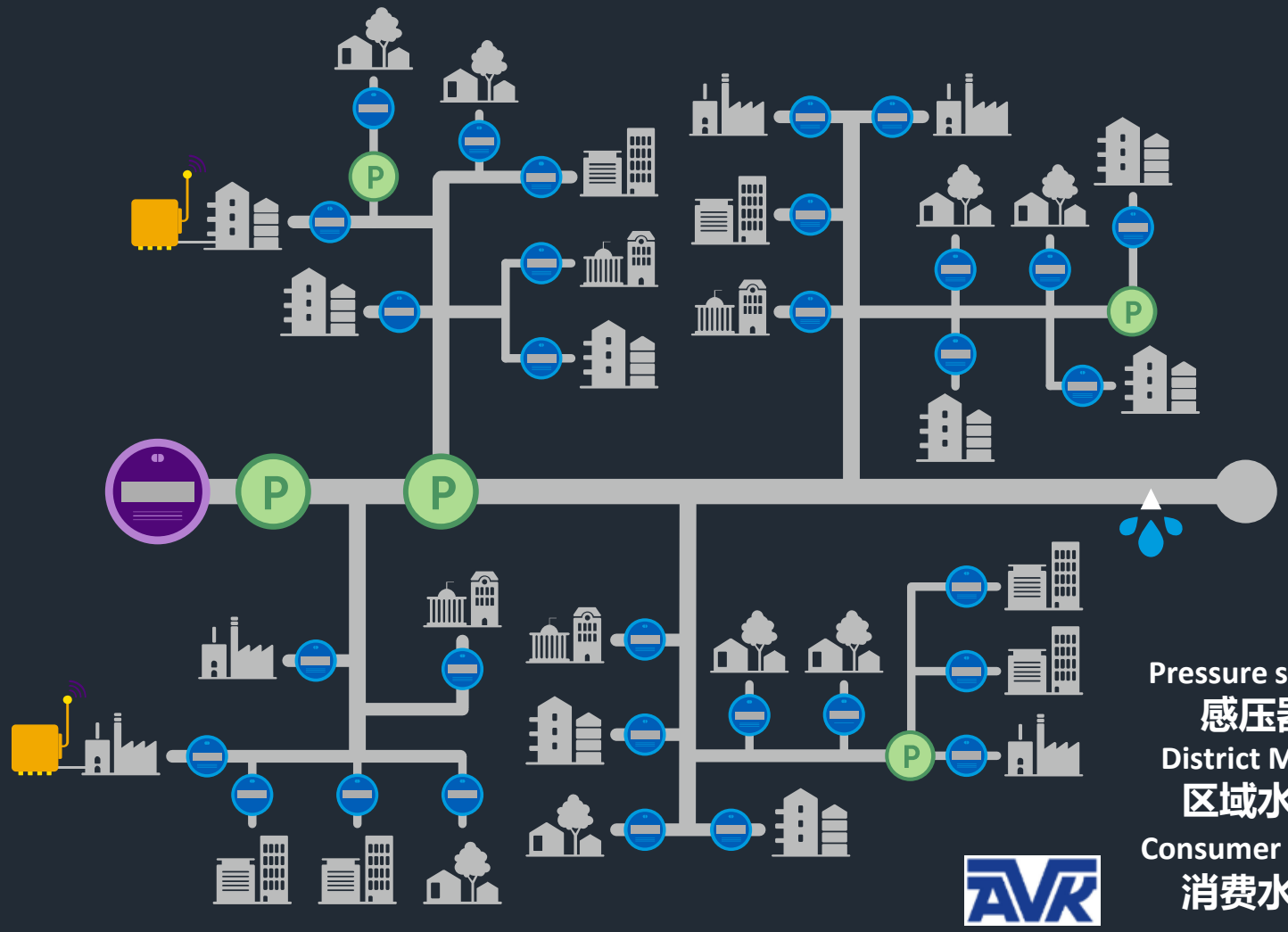


2，区装表计量

District Meter Areas (DMA)

一个DMA区域是指在供水系统中的由水阀或者闭合水管隔开的一个特定区域。流入这个区域的水以及该区域被消费的水都会被系统记录。通过记录的基本数据可以精确计算该区域的水流失。

A district metered area (DMA) is a defined area within the water distribution network. It is closed either by valves or by permanently disconnected pipes. Water coming into the area is metered, as well as the water used in the area. On the basis of these measurements it is possible to make a precise water loss analysis.



3，
渗漏检测
Leakage Detection

超前渗漏检测
PROACTIVE LEAKAGE DETECTION

- 使命必达

Personal Commitment

- 有效查探

Effective Investigation

- 全面概述

Holistic Overview

- 专属方案

Tailored Solutions

- 显著成果

Significant Results

- 跟进答疑

Seamless and Generic Interfaces

Leif Koch®

4，
水压管理
Pressure management

- **稳定的水压给消费者带来更多的用水舒适感**

Increases comfort by delivering a stable pressure in the critical points

- **节能**

Saves energy as pressure is lowered on average

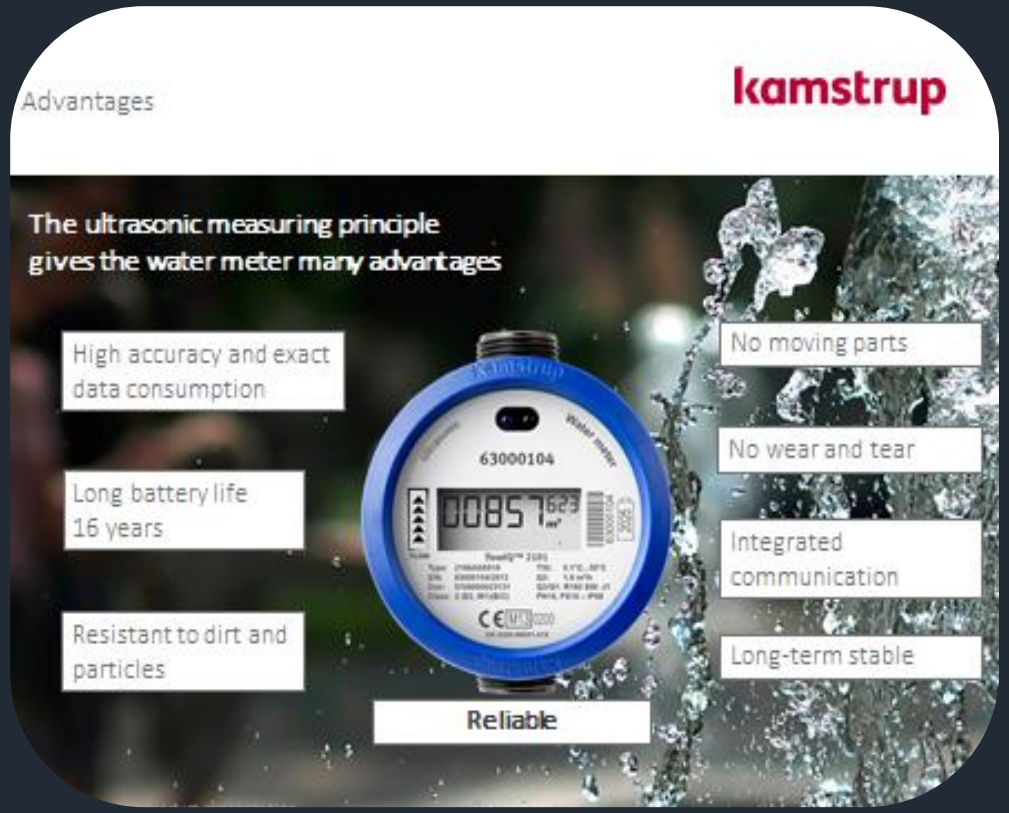
- **降低水管渗漏风险**

Reduces leakage due to lower pressure

- **降低管道崩裂风险**

Minimizes the risk of pipe bursts due to more stable pressure

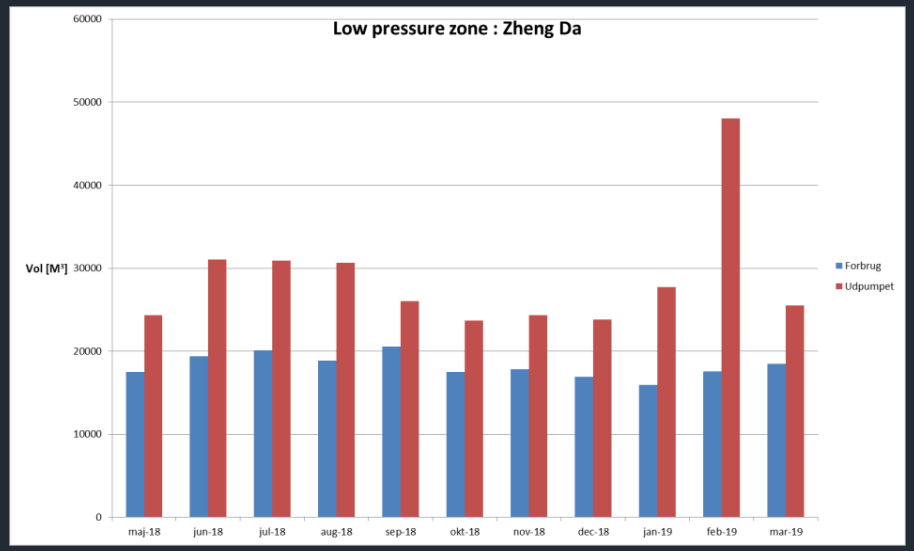
5，
精确计量水表
Accurate consumermeters



6，
水阀调度
Pump arrangements

水平衡 社区案例

Water balance – one domestic zone



水平衡2018年5月– 2019年3月

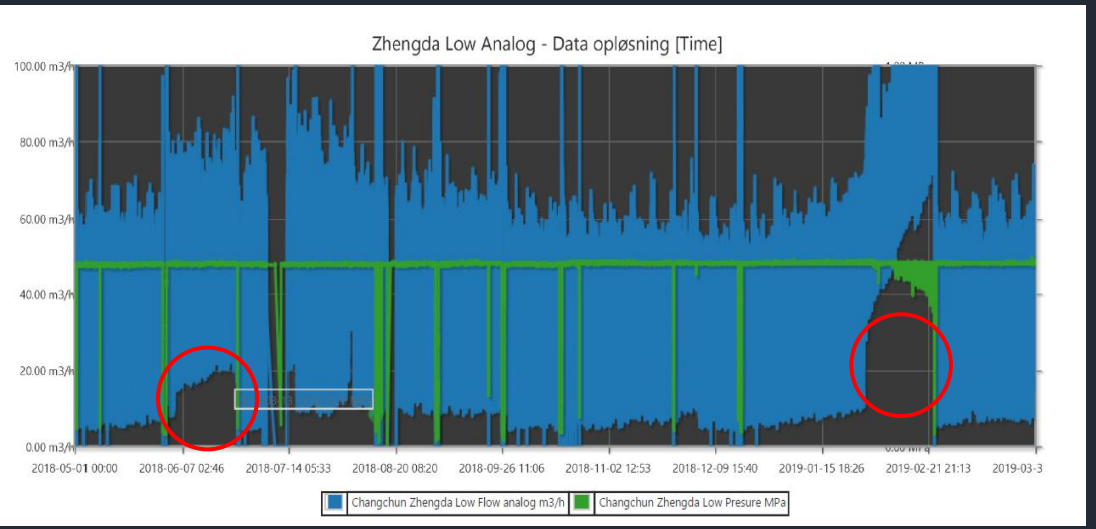
供水输出量 （红）	316.100 m3
用户水表计量 (蓝)	200.700 m3
NRW	115.400 m3

NRW % **36%**

Water balance May 2018 – March 2019

Water supplied (red colums)	316.100 m3
Water meter registrations (blue colums)	200.700 m3
NRW	115.400 m3

NRW % **36%**



实体损失 – 管道渗漏:

2018年6月	6.000 m3.
2019年2月	23.200 m3
大约 5 m3/小时	44.000 m3
实体亏损	73.200 m3

系统渗漏占比供水总量= 20%

商业损失(36% - 20%) = 16%

这些损失大多是由水表计量差误所导致

Physical losses - Leakage:

June 2018	6.000 m3.
Feb 2019	23.200 m3
General 5 m3/hour	44.000 m3
Physical losses	73.200 m3

Total leakage = 20%

Commercial losses (36% - 20%) = 16%

Mostly these losses are anticipated to be inaccurate meters

降低产销差项目=高回报型项目

项目投资1百万人民币，实施1-5步，每年可减少***80.000 m3*** 水流失，相当于每年节约了 ***￥200.000*** 的生产成本。

Reducing NRW has a good business case.

For step 1- 5 in the area the investment is 1 mill CNY to reduce NRW with 80.000 m3/year. The reduced production costs are 200.000 CNY/year.

5年 实现项目 ***百分百*** 投资回报

两年培训期结束后，本地业务能力的提升将持续降低项目投入成本， 项目百分百回报有望在四年内实现

ROI 5 years

After 2 years when training are finalised the investment in one area will be reduced and the ROI is expected to decrease to 4 years.

一个拥有6百万人口的城市每年需要生产4亿吨水来供给。NRW从**25%**降低至**12%**，每年能够节约***5千万吨***水= 每年节省***一亿元***人民币

One town with 6 mill people produces 400 mill m3/year. By reducing NRW from around 25% to 12% will save around 50 mill m3 of water/ year representing a value around 100 mill CNY pr. year.

效益

Benefits

- 当管道泄漏使自来水资源与土壤接触时，有污染自来水的风险
- 减少饮水对环境的影响
- 通过压力控制延长供水系统的使用寿命
- 降低能耗，降低管道泄漏对自来水公司造成的经济损失
- 渗漏造成的水资源浪费，当城市水资源发生短缺，那么城市发展的速度会大大降低

- risk for contamination of drinking water when a leak makes contact between water and soil possible
- lower environmental impact from water intake
- longer life time of the network with pressure control
- lower energy consumption， Leakage has negative impact on the economy of the water company
- Leakage will slow down the growth of the city if shortage of water occurs

障碍

Barriers

- 水和能源的低损耗
- 降低产销差需要管理层的变通与支持
- 回收水的处理需要额外费用
- 使用科技手段降低NRW的项目成果是细水长流的一个过程，需要更多的耐心与计划

- low tarifs on water and energy
- the work for lower NRW requires organisational change
- all consequences of water recovery are not included in the cost of water
- the work with technology for lower NRW has not the same potent as change pipe projects
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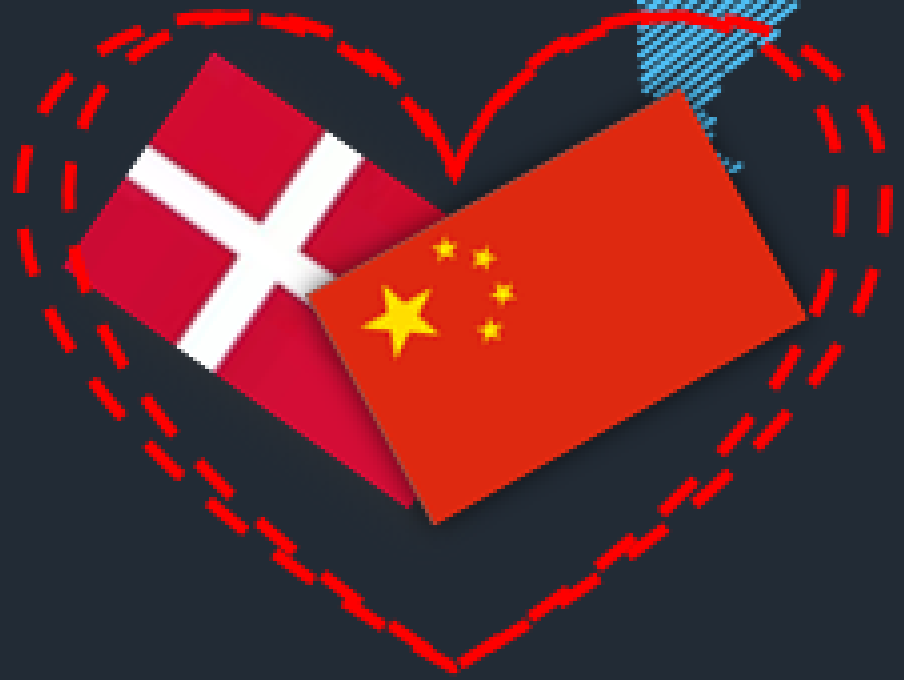

为保卫水资源而战， 我们与你同在

We are here with you, to fight against water loss