Water Supply Resilience
供水韧性

11th CEWP High-Level Dialogue Conference

第十一届中欧水资源平台（CEWP）高层对话会议

Brussels
布鲁塞尔

João Feliciano
若昂•费利西亚诺

February 2026

AGS WaterSolutions

Relevant global challenges
相关全球性挑战

Demographic phenomena
人口现象

- Migrations

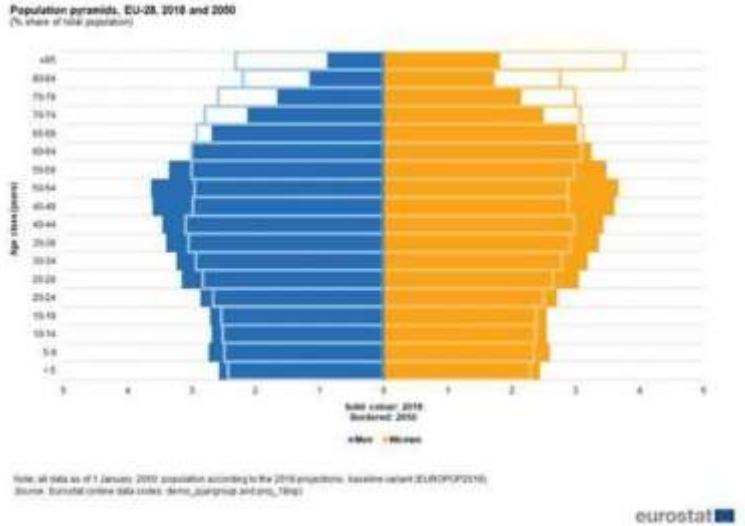
  人口迁移

- Population ageing (mainly in developed countries)

  人口老龄化（主要发生在发达国家）

- Extreme population growing – management and planning of "*megacities*"
  极端人口增长——"超大城市"的管理与规划

Population growth – 1900 / 2050
人口增长 – 1900年 / 2050年



Population pyramid in EU-28: population in 2018 and estimate for 2050.
欧盟28国人口金字塔：2018年人口及2050年预测。

Between 2008/2018 the population in Portugal decreased 274 thousand people
2008至2018年间，葡萄牙人口减少了27.4万人。

better PLANNING
更好的规划

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Relevant global challenges
相关全球性挑战

Climate change
气候变化

- Scarcity
  水资源短缺
- Floods
  洪水
- Extreme droughts
  极端干旱
- Quality variation on waterbodies
  水体质量变化

Scarcity in Cape Town – 2018
2018年的开普敦水危机

Drought in Contreras, Valencia, Spain 2025
2025年的西班牙瓦伦西亚孔特雷拉斯地区大旱

Floods in Valencia, Spain 2025
2025年的西班牙瓦伦西亚洪水

planning more **RESILIENT SYSTEMS**
规划更具**韧性的系统**

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Relevant global challenges
相关全球性挑战

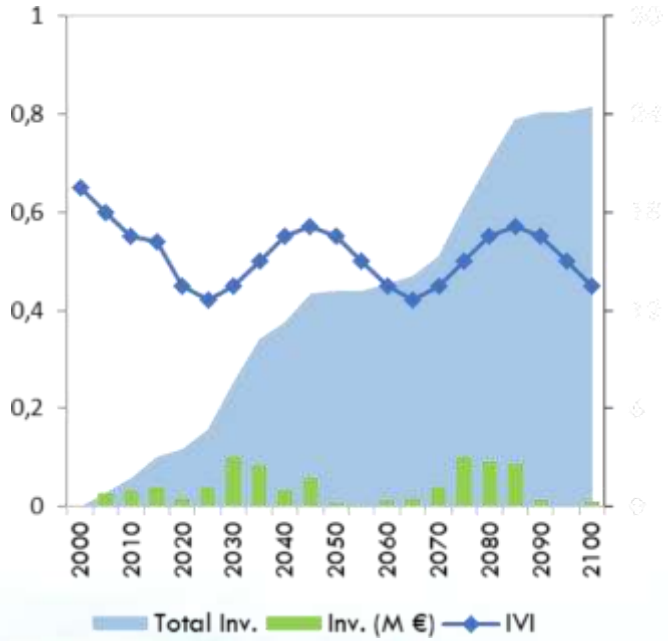
Infrastructures
基础设施

- Ageing infrastructure, ageing population (developed countries)

  基础设施老化，人口老龄化（发达国家）

- Investment needs
  投资需求

- Rehabilitate whilst renovating to guarantee:
  修复与更新并举，以确保：
  - Carbon neutrality
    碳中和
  - Circular economy
    循环经济
  - Infrastructure sustainability
    基础设施可持续性



better ASSET MANAGEMENT
更佳资产管理

Relevant global challenges
相关全球性挑战

Sustainable cities
可持续城市

- *Nexus* water/energy/food
  水-能源-食品关联关系
- Resources recycling
  资源循环利用
- Circular economy
  循环经济
- Communication between different sectors (water, energy, environmental agencies, technology, others)
  不同部门（水、能源、环保机构、技术等）间的沟通

Cyprus is EU leader in wastewater recycling – around 90%
塞浦路斯是欧盟废水回用领域的领导者——**回用率**约(90%)

Lisbon – European Green Capital 2020
***里斯本** – 2020**年欧洲**绿色之都*

Grenoble – European Green Capital 2022
***格勒**诺布尔 – 2022**年欧洲**绿色之都*

Valencia – European Green Capital 2024
***瓦**伦西亚 – 2024**年欧洲**绿色之都*

Guimarães – European Green Capital 2026
***吉**马良斯 – 2026**年欧洲**绿色之都*

better **QUALITY OF SERVICE**
更佳**服务质量**

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AGS background & experience
AGS公司背景与经验

AGS WaterSolutions

AGS presentation
AGS公司介绍

MARUBENI 100%
丸红全资持股

AGS has been working in the water sector for more than 35 years, focusing on the preservation of the environment and acting throughout the urban water cycle.
AGS在水务领域拥有超过35年的经验，专注于环境保护并活跃于城市水循环的各个环节。

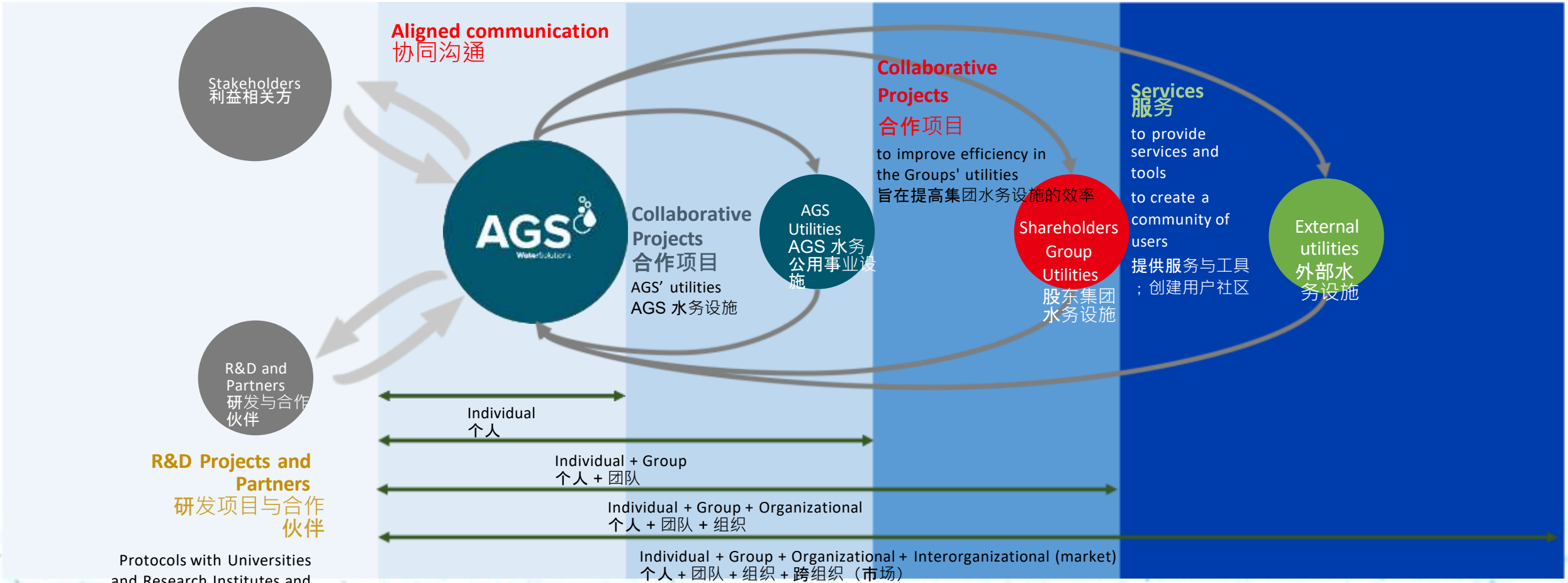
AGS activities range from consultancy and development of specialized engineering services to the management, operation and maintenance of urban water systems and treatment facilities.
AGS的业务范围涵盖咨询与专业工程服务开发，以及城市水系统与处理设施的管理、运营和维护。

FRAMEWORK & SERVICES:
框架与服务：

- Concessions and PPP
  特许经营与公私合营（PPP）
  ±1,5 million inhabitants served
  向约150万居民提供服务
- Performance-based agreements
  基于绩效的协议
- Operation & maintenance contracts
  运维合同
- Engineering services provider
  工程服务提供商
- IT services provider
  IT服务提供商

AGS WaterSolutions

Boosting utilities' resilience
提升水务设施韧性



AGSc watersolutions

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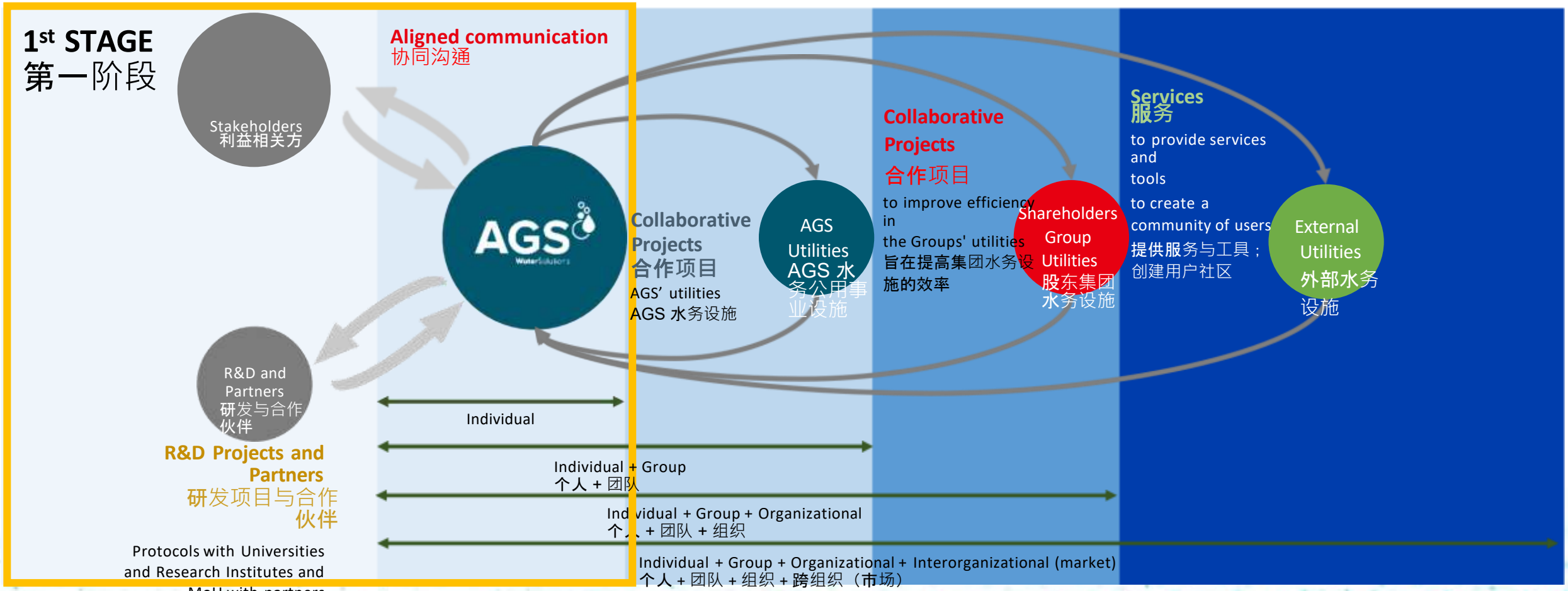

Creating knowledge through collaboration
通过协作创造知识

1st STAGE | IMPROVING KNOWLEDGE
第一阶段 | 增进知识

Link with R&D Institutes

与研发机构合作

AGS main goals
AGS主要目标

- Implement a **technical culture** inside the organization
  在组织内部培育**技术文化**
- **Increase knowledge** based on standardized methodologies
  基于标准化方法**增加知识积累**
- Create a **solid technical team** transversal to the entire Organization
  打造一支贯穿整个组织的**稳固技术团队**

National and international R&D projects | 2001 – 2021
国内与国际研发项目 | 2001 – 2021

- Asset management
  资产管理
- Hydraulic modelling
  水力建模
- Performance assessment
  绩效评估
- Water and energy efficiency
  水与能源效率
- Inflow and infiltration
  入流与入渗
- Water and wastewater treatment
  水与废水处理

CAREW

Computer Aided REhabilitation of Water Networks | 2001 – 2004
给水管网计算机辅助修复 | 2001 - 2004

INSSAA

National Initiative for Simulation of Water Supply Systems | 2003 – 2005
国家供水系统模拟计划 | 2003 - 2005

AWARE-P

Advanced Water Asset Rehabilitation of water networks Project | 2009 – 2013
先进水务资产修复项目 | 2009 - 2013

iPerdas

National Initiative for water-energy loss management | 2014 – 2015
国家水与能源损失管理计划 | 2014 - 2015

iAflui

National Initiative for inflow & infiltration control | 2016 – 2017
国家入流与入渗控制计划 | 2016 - 2017

iEQTA

National Initiative for energy, quality and water treatment | 2017 – 2020
国家能源、水质与水处理计划 | 2017 - 2020

AGS watersolutions

Creating knowledge through collaboration
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1st STAGE | IMPROVING KNOWLEDGE
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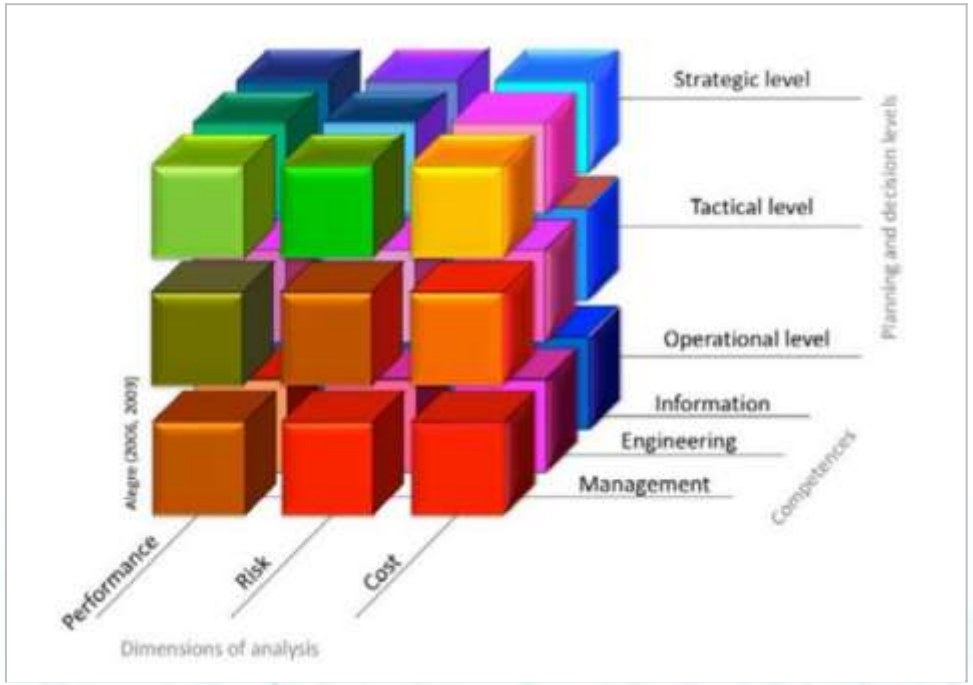
Link with R&D Institutes
与研发机构合作

AAREP"

AWARE-P METHODOLOGY
AWARE-P 方法论



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  打造一支贯穿整个组织的**稳固技术团队**

Who are we at present?
我们当前处于何种状态？
What infrastructures do we own or operate?
我们拥有或运营哪些基础设施？
What service do we deliver?
我们提供何种服务？
Where do we want to be in the long term?
我们的长期目标是什么？
How do we get there?
我们如何达成目标？

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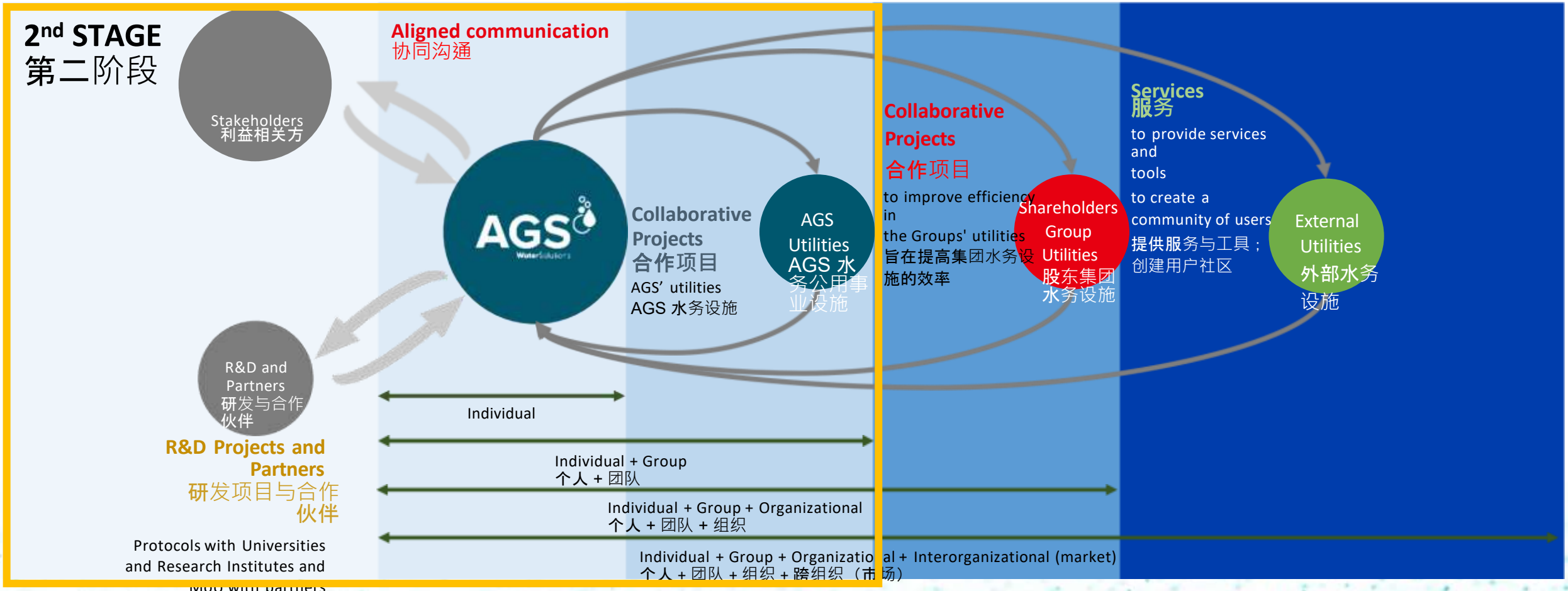
Boosting utilities' resilience
提升水务设施韧性



Knowledge transfer & development of tools
知识转移与工具开发

2nd STAGE | COLLABORATIVE PROJECT IN AGS UTILITES
第二阶段 | AGS公用事业公司内的协作项目

Knowledge transfer & development of tools
知识转移与工具开发

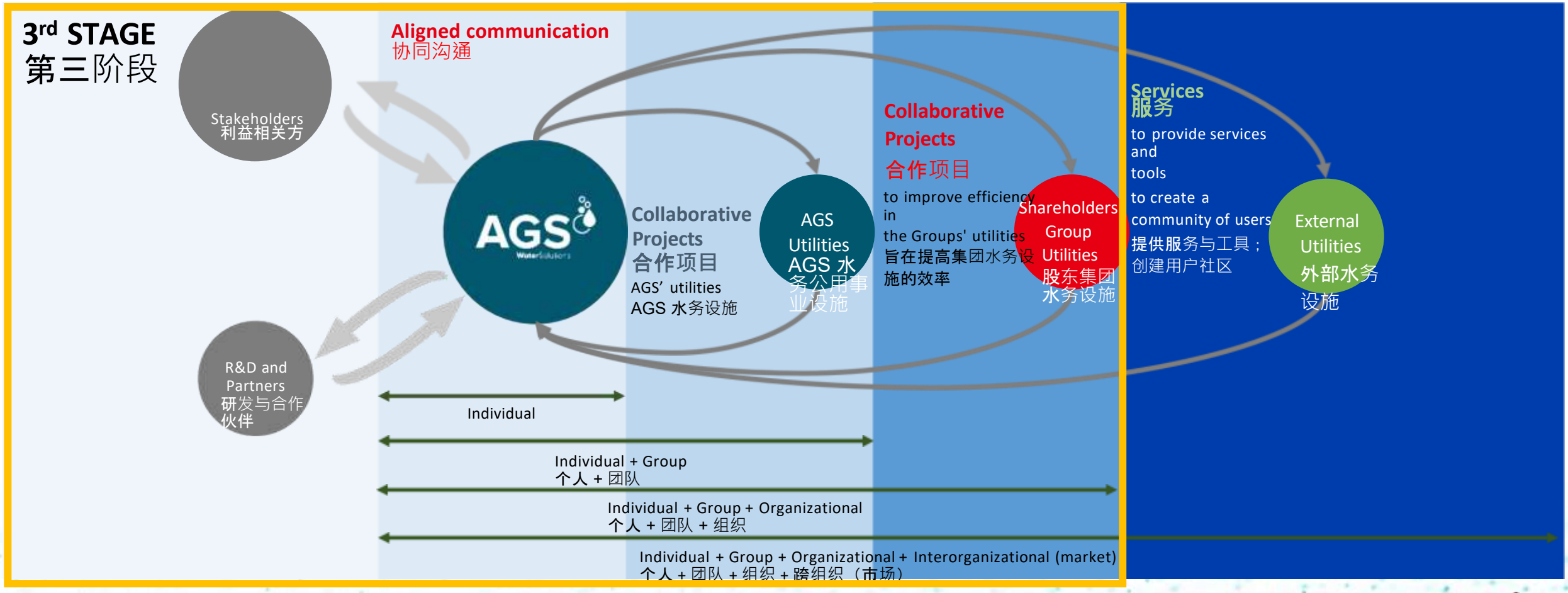
AGS main goals
AGS主要目标

- **Knowledge transfer** to technical teams
  向技术团队进行**知识转移**
- **Alignment and standardization** of processes inside AGS group
  实现AGS**集**团内部流程的**统一与标准化**
- **Testing methodologies** in a group of utilities with diverse dimensions and contexts
  在规模与背景各异的公用事业机构群中**测试方法体系**
- Translating knowledge into **technological tools,** as *"packaged knowledge"*
  将知识转化为**技术工具**，**即"知**识封装化"

Projects 项目	2007	Tools 工具
Hydraulic modelling program *水力建模程序* *2007-2011*		waterwise. *performance monitoring* 绩效监控
Asset management program *资产管理程序* *2012-2016*		flowise. *real-time monitoring of water & wastewater systems* **水与**废水系统实时监控
Water-energy loss program *水与能源损失控制计划* *2016-2017*		meterwise. *customer meters management* **用**户水表管理
Sustainability & efficiency program **可持**续性与效率提升计划 *2018-2022*		infrawise. *real-time monitoring of corporate clients* **企**业客户实时监控 *optimized rehabilitation investments* 优化修复投资

AGS watersolutions

Boosting utilities' resilience
提升水务设施韧性



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Results applied in other utilities
成果应用于其他公用事业机构

3rd STAGE I COLLABORATİVE PROJECT İN GROUP UTİLİTES
第三阶段 | 集团水务设施协作项目

Implementation of methodology and tools

方法与工具的实施

Non-revenue water reduction project in four Chilean utilities

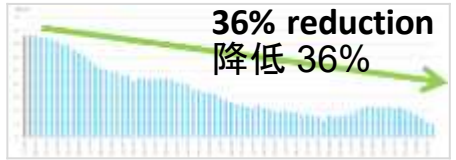
智利四家公用事业公司的非收益水削减项目

Project main achievements:
项目主要成果：

- Standardized approach to water losses control
  水损控制的标准化方法
- Improvement of network knowledge and teams' know- how
  提升对管网的认识和团队技能
- Increase of operational control
  增强运营控制
- Better alignment and effective teamwork
  更好的协调与高效的团队合作
- Increase in data management and reliability
  提升数据管理与可靠性
- Implementation of new technologies
  新技术的应用

Utility A – since Sep 2015
水务运营单位A – 自 2015 年 9 月起
1100 km | 公里管网
500 000 inhabitants | 居民
- 25,3 million m³

Utility B – since Sep 2015
水务运营单位B – 自 2015 年 9 月起
2000 km | 公里管网
940 000 inhabitants | 居民
- 61,7 million m³



Utility C – since Jan 2019
水务运营单位C – 自 2019 年 1 月起
860 km | 公里管网
280 000 inhabitants | 居民
- 1,0 million m³

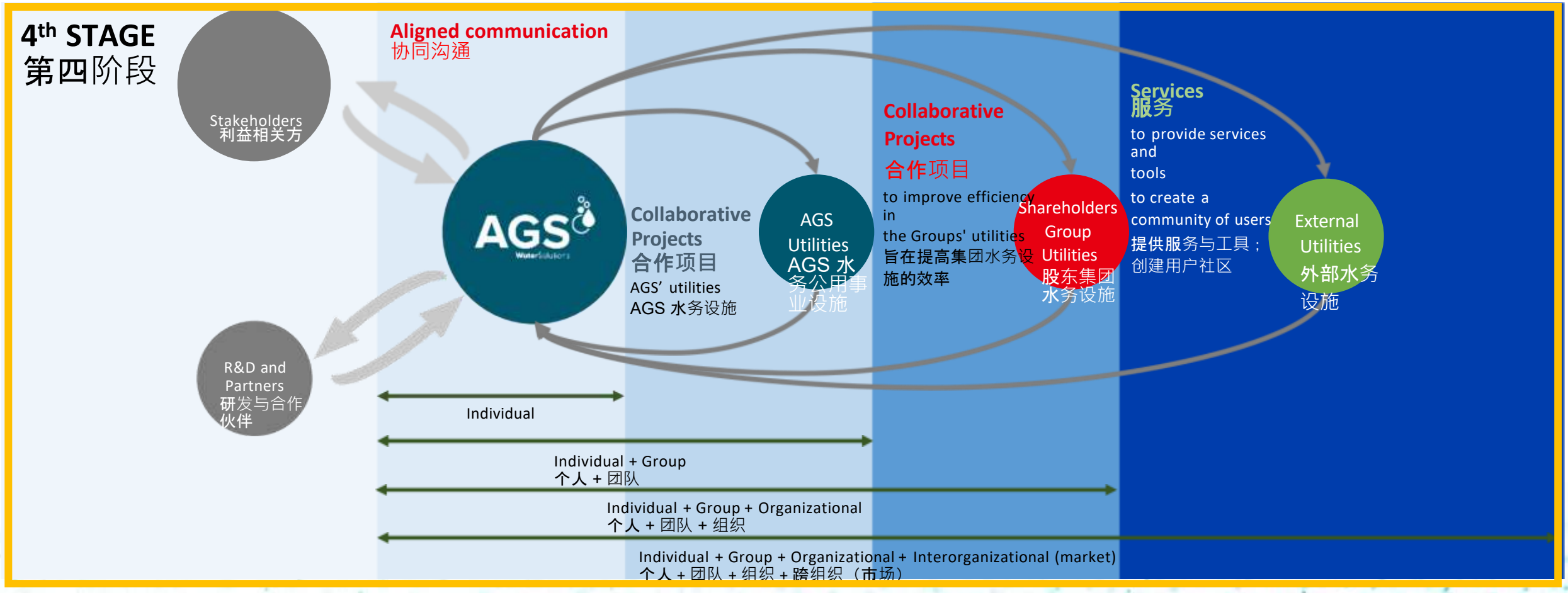
Utility D – since Jun 2021
水务运营单位D – 自 2021 年 6 月起
625 km | 公里管网
120 000 inhabitants | 居民
- 0,5 million m³

5,200 Olympic swimming pools/year
每年节省相当于 5200 个奥运标准游泳池的水量

Estimated savings of 12 MUSD/year
预计每年节省 1200 万美元

AGS water solutions

Boosting utilities' resilience
提升水务设施韧性



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Outcomes and externalization
成果的推广应用

4th STAGE I PROVIDE SERVICES TO EXTERNAL COMPANIES
第四阶段 | 向外部公司提供服务

Performance based agreement, technical assistance and tools
基于绩效的协议、技术协助与工具

WATER EFFICIENCY IMPROVEMENT in the water supply system of the municipality of Constanta
康斯坦察市供水系统的水效提升

Utility main goals
5-year project
水务公司的主要目标
为期5年的项目

- **Non-revenue water** reduction
- **Infrastructure resilience** improvement
- Reduction of **water losses** in the network

- **降低无收益水**
- **提升基础设施韧性**
- **减少管网中的水损**

RAJA, ROMANIA
罗马尼亚，拉贾

700 km of network
35 300 customers
265 000 inhabitants

700 公里管网
3.53 万用户
26.5 万居民

成果
项目在第五年结束
延期1年（仍在进行中）

Achievements
Project 5th year concluded
1-year extension (on going)

140+ flow meters, **300** pressure meters and **84** monitoring areas
140余个流量计、300个压力计和84个监测区域
Development of a **hydraulic model**
开发水力模型
Implementation of **3** AGS' software solutions
实施**3项**AGS软件解决方案
20 training sessions for more than **100** employees
开展20场培训，覆盖**100余名**员工
Reduction of 13,7 Mm³/year of NRW
无收益水年减少量达13.7百万立方米

59% Non-revenue water
59% 的无收益水量

30 Mm³
of water lost in the system
系统中损失了 **3000 万立方米** 的水

BBC StoryWorks documentary
BBC StoryWorks 纪录片
*Project identified by **International Water Association (IWA)** to be part of the online film series **#BeneathTheSurface** produced by **BBC StoryWorks***
本项目被国际水协会（IWA）选中，收录于BBC StoryWorks制作的在线系列短片《#BeneathTheSurface》中
https://www.bbc.com/storyworks/beneath-the-surface/the-city-below

Outcomes and externalization
成果的推广应用

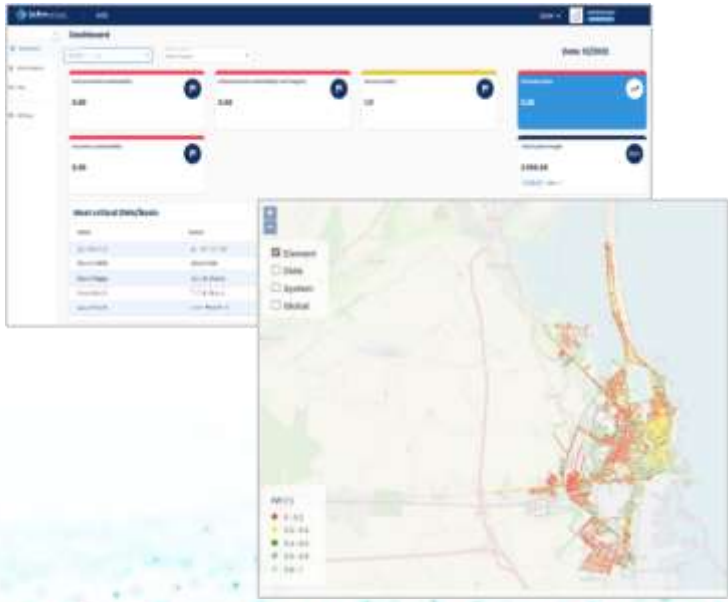
4th STAGE I PROVIDE SERVICES TO EXTERNAL COMPANIES
第四阶段 | 向外部公司提供服务

Asset management & water loss reduction using AI to calculate the likelihood offailure (LoF)
利用人工智能计算失效可能性（LoF）进行资产管理与漏损控制

infrawise.

JAPAN 日本

- **Present in 6 cities:** Sendai, Myoko, Ashikaga, Takasaki, Kazusa and Shizuoka
  业务覆盖6个城市：仙台、妙高、足利、高崎、上总和静冈
- Projects for **2,2 million** inhabitants, 7740 km of water network and 2 520 km for wastewater network
  项目服务于**220万居民**，涵盖7740公里供水管网和2520公里污水管网
- Rehabilitation plans and support on leak detection activities using artificial intelligence
  利用人工智能制定修复计划并支持检漏活动



PHILIPPINES 菲律宾

- Maynilad water services serving 9,5 million inhabitants
  Maynild水业服务950**万居民**
- Project for 3 244 km of network
  项目涉及3244**公里管网**
- Prioritization of **leak detection activities based on the LoF** of each pipe, increasing detection efficiency
  基于每段管道的失效可能性（LoF）对检漏活动进行优先级排序，**提高**检测效率

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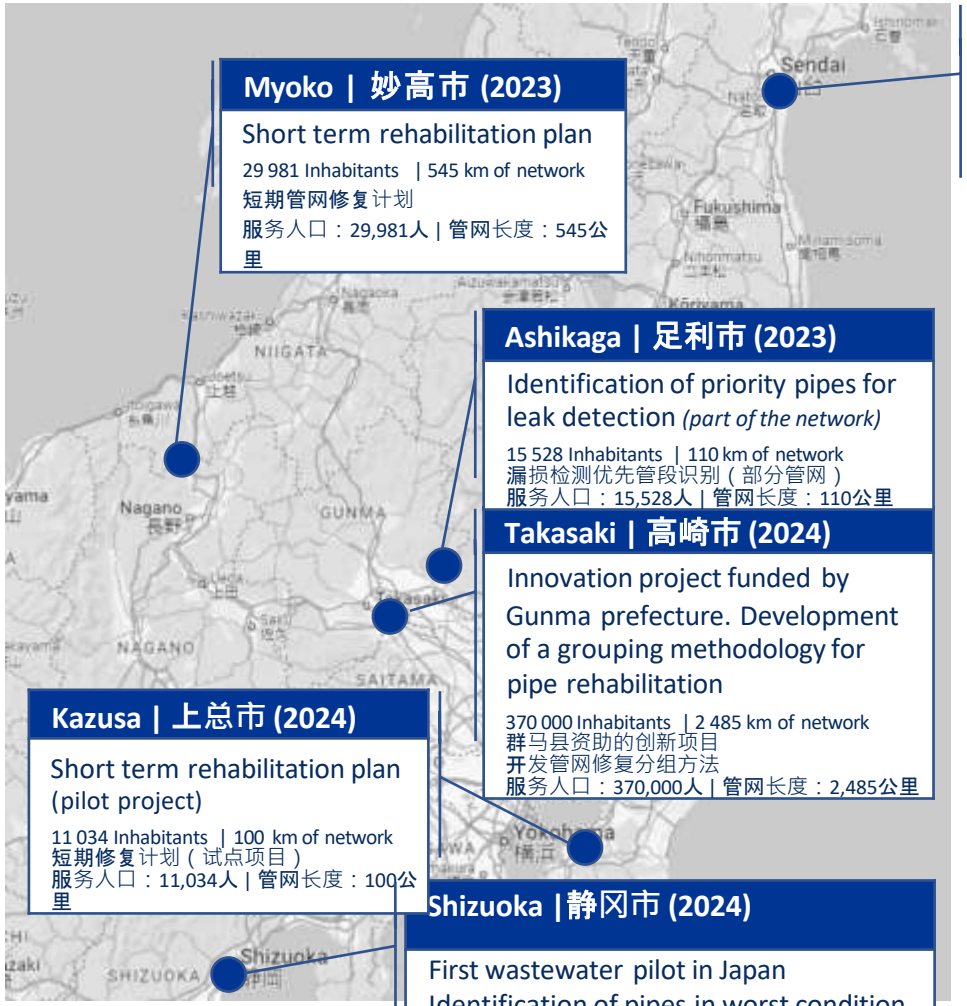
Increasing resilience & sustainability
提升韧性与可持续性

SUCCESSFUL PROJECTS IN JAPAN
日本成功项目案例



Myoko | 妙高市 (2023)
Short term rehabilitation plan

29 981 Inhabitants | 545 km of network
短期管网修复计划
服务人口：29,981人 | 管网长度：545公里

Sendai | 仙台市 (2023)
First long-term prediction of LoF values using AI in Japan

1,0 million Inhabitants | 4 500 km of network
日本首次运用AI进行管网剩余寿命长期预测
服务人口：100万人 | 管网长度：4,500公里

Ashikaga | 足利市 (2023)
Identification of priority pipes for leak detection *(part of the network)*

15 528 Inhabitants | 110 km of network
漏损检测优先管段识别（部分管网）
服务人口：15,528人 | 管网长度：110公里

Takasaki | 高崎市 (2024)
Innovation project funded by Gunma prefecture. Development of a grouping methodology for pipe rehabilitation

370 000 Inhabitants | 2 485 km of network
群马县资助的创新项目
开发管网修复分组方法
服务人口：370,000人 | 管网长度：2,485公里

Kazusa | 上总市 (2024)
Short term rehabilitation plan (pilot project)

11 034 Inhabitants | 100 km of network
短期修复计划（试点项目）
服务人口：11,034人 | 管网长度：100公里

Shizuoka |静冈市 (2024)
First wastewater pilot in Japan
Identification of pipes in worst condition

693 389 Inhabitants | 2 520 km of network
日本首个废水处理试点项目
识别最差状况管段

Sendai project - Special Award
仙台项目 – 特别奖

Sendai city has won a Special Award at the **2024 Water Supply Innovation Awards**, presented by the **Japan Water Works Association** (JWWA), for their project "*Leading the future from data - Visualizing the future of /people,, /things,, and /money, using AI.*"

仙台市凭借"**以数据引**领未来——**运用**AI实现人、物、财未来可视化"项目，在**2024年日本水道协会**（JWWA）给水创新奖评选中荣获特别奖。

infrawise.

Rehabilitation plans and support on leak detection with Artificial Intelligence
基于人工智能的管网修复计划与漏损检测支持

- Six project in total
  共计六个项目
- Variety of scopes and deliverables
  涵盖多个范围与交付成果
- Capacity to innovate and tailor the solutions to the clients needs
  具备创新能力和为客户定制解决方案的实力
- One prize won & one innovation project funded
  荣获一项奖项并获一项创新项目资助

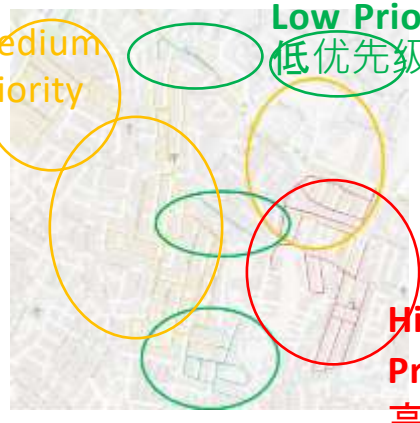
AGS WaterSolutions

Increasing resilience & sustainability
提升韧性与可持续性

SUCCESSFUL PROJECTS IN PHILIPPINES

菲律宾成功项目案例

MAYNILAD
马尼拉水务公司



Identification of priority DMAs
优先片区识别

Identification of priority elements
优先要素识别

Field work
现场工作

Efficiency above
2.0 leaks/km inspected
检测效率 > 2.0处漏点/公里

infrawise.

Prioritization of active leakage detection activities with Artificial Intelligence

基于人工智能的主动漏损检测活动优先级排序

- First project: 410 DMAs (2023-2024)
  第一阶段项目：410个片区（2023-2024年）
- Second project: 307 DMAs (2024-2025)
  第二阶段项目：307个片区（2024-2025年）
- Third project: Primary lines (2025)
  第三阶段项目：主管线（2025年）
- 2,650+ leaks detected
  累计检测到 2,650+ 处漏点
- **Water losses reduction: 31,000m³/day**
  水损失减少量：31,000立方米/天

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Reinforce resilience through cooperation
通过合作增强韧性

Promote mechanisms for **knowledge generation and innovation** on public policies.
促进公共政策知识生成与创新的机制。

Increase **knowledge sharing** within **water utilities** and between water utilities and **research institutes**.
加强水务公司内部以及水务公司与研究机构之间的知识共享。

Water utilities are typically conservative and non-attractive to the young workforce. In- depth debate on **strategies for attracting and retaining human resources** should take place.
水务公司通常较为保守，对年轻劳动力缺乏吸引力。应深入探讨吸引和留住人才的策略。

Promote the sharing of knowledge with **other geographies** where different **challenges** occur and different **methodologies** and **technologies** have been proven successful.
促进与面临不同挑战、且不同方法技术已被验证有效的其他地区进行知识共享。

Analysis and debate on **financing models** for the **innovation in the water sector**.
对水务领域创新的融资模式进行分析和探讨。

Create a **sense of urgency** to **encourage change** in the water sector to promote **resilience**.
营造紧迫感，以鼓励水务行业变革，提升韧性。

Thank you
谢谢您！

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