[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

[Hosted by]

SWA
SINGAPORE WATER ASSOCIATION

[Presented by]

ardurra
international

[Supported by]

PUB SINGAPORE WATER EXCHANGE

[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

Housekeeping

- ✓ To ensure better connectivity, please mute your microphone and turn off the camera. You may communicate with us after the event.
- ✓ Please share your questions in Q & A icon (right bottom) where we will try to provide answers where possible in each Segment.
- ✓ Do identify yourself so we can respond to any unanswered questions
- ✓ We will be recording this session and reserve the rights to the video
- ✓ Please complete a 1min poll survey at end of the session. We will forward the recording and presentation deck to the respondents.

[Hosted by] SWA Singapore Water Association

[Presented by] ardurra international

[Supported by] PUB Singapore Water Exchange

[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

Disclaimer

- All information shared is for general information only and does not contain or convey any legal advice or administrative assistance.
- Information shared today is true and accurate as of publication date.
- The organiser and speaker reserve all rights in the provided materials

[Hosted by] SWA Singapore Water Association

[Presented by] ardurra international

[Supported by] PUB Singapore Water Exchange

[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

Welcome Address

Mr Fong Han Loong

Senior Assistant Director, Industry and Technology Collaboration
PUB, Singapore's National Water Agency

Han Loong is the Senior Assistant Director of the Industry and Technology Collaboration Department (InTeC) of PUB, Singapore's National Water Agency. He focuses on enhancing relationships with key Government and Global private water sectors, and promoting Singapore's brand as a Global Hydro Hub.

[Hosted by] SWA Singapore Water Association

[Presented by] ardurra international

[Supported by] PUB Singapore Water Exchange

[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

Speaker

Mr Rodney Chapin

Founder and CEO of Ardurra International

With US and Singapore based companies focused on technology solutions, mergers and acquisitions, advisory and project development in the water/waste/energy sectors. Ardurra specializes on bringing creative solutions using innovative technologies or concepts to projects in the water and waste sectors.

Current clients of Ardurra International include private water and waste sector investors, technology companies, local developers and operations companies, the Asian Development Bank, local and regional governments.

[Hosted by] SWA Singapore Water Association

[Presented by] ardurra international

[Supported by] PUB Singapore Water Exchange

ardurra international

strategic thinking • creative solutions

19 May 2021

Water Project Opportunities in the Industrial Sector in the Philippines and Vietnam

Presentation Outline

- Introduction of Ardurra International
- Comparison of the markets in the Philippines and Vietnam
- Philippines Opportunities
  - By business type focus
  - By technical/sector focus
- Vietnam Opportunities
  - By business type focus
  - By technical/sector focus
- Discussion and Questions

The Approach is to Inform SWA Attendees of the Opportunities based on Ardurra's direct Experience and Insight

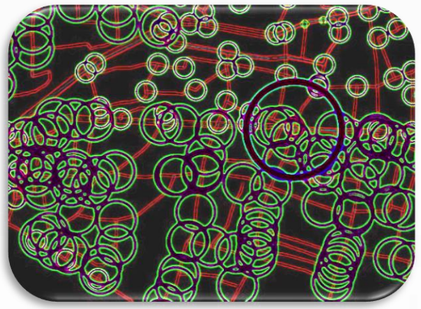
Ardurra International

- Ardurra International is a Services Company focused on the Water / Waste / Energy sectors
- We provide technology, advisory and investment solutions to public and private sector clients worldwide
- Companies/offices in the US and Singapore with team members worldwide
- Focus on Asia – with significant work in Philippines and Vietnam

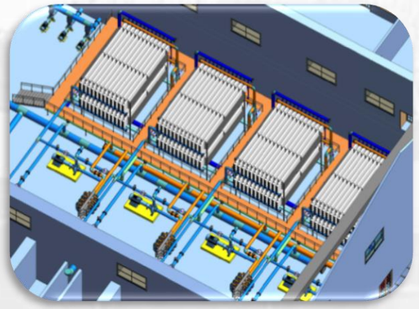
Ardurra International Expertise

we have extensive technical expertise across many sectors – with a focus on efficient, sustainable and cost-effective solutions in the following areas

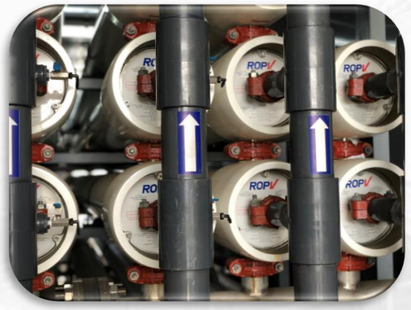
smart water systems



desalination zld and mld



wastewater recycling



waste-to-value and energy efficiency

sustainable treatment

industrial treatment

Ardurra International Project Experience

Georgia

- Water system evaluation (5 systems with total capacity of 400,000 m^3/day)
- Wastewater system evaluation (4 systems with capacity of 50,000 m^3/day)

Uzbekistan

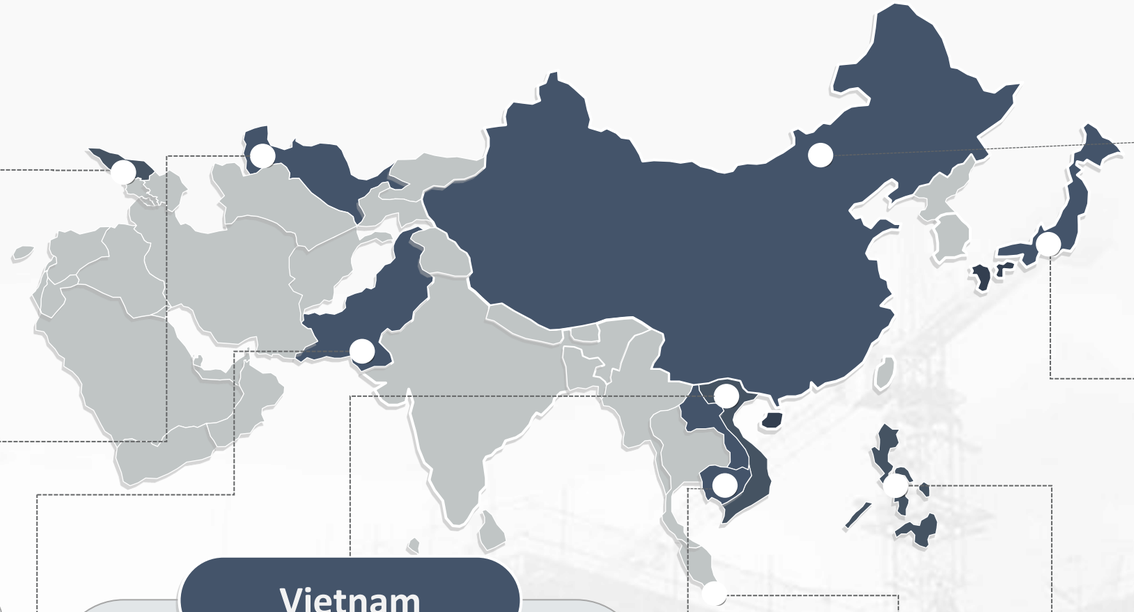
- Wastewater treatment plant (75,000 m^3/day) Pre-FS and PPP procurement support

Pakistan

- Karachi wastewater recycling plant (800,000 m^3/day) Pre-FS and PPP procurement support

Other Geographies

- Biomass-to-Energy project feasibility study and DD **(USA)**
- Waste-to-energy gasification feasibility study **(Ghana)**
- Water/wastewater system energy tool development **(ADB - Asia Regional)**
- Emerging technologies identification / evaluation for wastewater recycling for MNC **(Worldwide)**



Vietnam

- Water system DD for industrial bulk water supply
- Water supply DD for 4 water systems (total capacity of 300,000 m^3/day)
- GHG reduction/fuel catalyst implementation
- Wastewater recycling company M&A advisory
- Rooftop Solar PV program implementation
- Regional water demand study evaluating the impacts of COVID-19
- Water company operational and business review
- Advisory for Water treatment facility operations contract and bulk water supply agreement
- Contract closeout audit/review for water treatment system construction

Singapore

- Advisory services for water/wastewater technology accelerator

Laos/Cambodia

- Conceptual design for Vientiane WWTP
- Geotechnical and structural evaluation for housing Project in Phnom Penh

China

- Wastewater system energy evaluation (3 plants with total capacity 450,000 m^3/day)

Japan

- Water treatment system manufacturer product development and implementation

Philippines

- Provincial water/wastewater master plan
- Groundwater treatment pilot study
- Provincial solid waste master plan
- Seawater desalination FS and project development (100,000 m^3/day)
- Rice waste biomass gasification system implementation
- Industrial water system project development and concept design
- Municipal waste-to-energy pilot plant study
- Surface water treatment and transmission system concept design
- Seawater desalination Pre-FS (20,000 and 30,000 m^3/day)
- Waste-to-Energy technology technical and business case evaluation
- Preliminary Design for 30,000 m^3/day seawater desalination facility
- Smart System NRW reduction pilot project for private water company

Ardurra International Project Experience

Georgia

- Water system evaluation (5 systems with total capacity of 400,000 m^3/day)
- Wastewater system evaluation (4 systems with capacity of 50,000 m^3/day)

Uzbekistan

- Wastewater treatment plant (75,000 m^3/day) Pre-FS and PPP procurement support

Pakistan

- Karachi wastewater recycling plant (800,000 m^3/day) Pre-FS and PPP procurement support

Other Geographies

- Biomass-to-Energy project feasibility study and DD **(USA)**
- Waste-to-energy gasification feasibility study **(Ghana)**
- Water/wastewater system energy tool development **(ADB - Asia Regional)**
- **Emerging technologies identification / evaluation for wastewater recycling for MNC (Worldwide)**

Vietnam

- **Water system DD for industrial bulk water supply**
- Water supply DD for 4 water systems (total capacity of 300,000 m^3/day)
- GHG reduction/fuel catalyst implementation
- **Wastewater recycling company M&A advisory**
- **Rooftop Solar PV program implementation**
- **Regional water demand study evaluating the impacts of COVID-19**
- **Water company operational and business review**
- **Advisory for Water treatment facility operations contract and bulk water supply agreement**
- **Contract closeout audit/review for water treatment system construction**

Singapore

- Advisory services for water/wastewater technology accelerator

Laos/Cambodia

- Conceptual design for Vientiane WWTP
- Geotechnical and structural evaluation for housing Project in Phnom Penh

China

- Wastewater system energy evaluation (3 plants with total capacity 450,000 m^3/day)

Japan

- Water treatment system manufacturer product development and implementation

Philippines

- Provincial water/wastewater master plan
- Groundwater treatment pilot study
- Provincial solid waste master plan
- Seawater desalination FS and project development (100,000 m^3/day)
- **Rice waste biomass gasification system implementation**
- **Industrial water system project development and concept design**
- Municipal waste-to-energy pilot plant study
- Surface water treatment and transmission system concept design
- Seawater desalination Pre-FS (20,000 and 30,000 m^3/day)
- **Waste-to-Energy technology technical and business case evaluation**
- Preliminary Design for 30,000 m^3/day seawater desalination facility
- **Smart System NRW reduction pilot project for private water company**

Rodney Chapin

- BS Agricultural Engineering & MS Environmental Engineering
- 25+ years experience in water/waste/energy (15 years NA and 10+ Years Asia/Pacific and Middle East)
- hands-on experience in North America, Asia, Australia, Africa and the Middle East
- managed regional business in the US (central states) and regional Asia business for a major consulting firm
- process expertise in water, wastewater, solid waste and bioresources management systems
- extensive experience in creative program, finance and project delivery solutions
- recently developed ADB's Energy Management Tool for water and wastewater systems (publication link)
- advisory board member for **Imagine H_2O Asia**

The Philippines and Vietnam

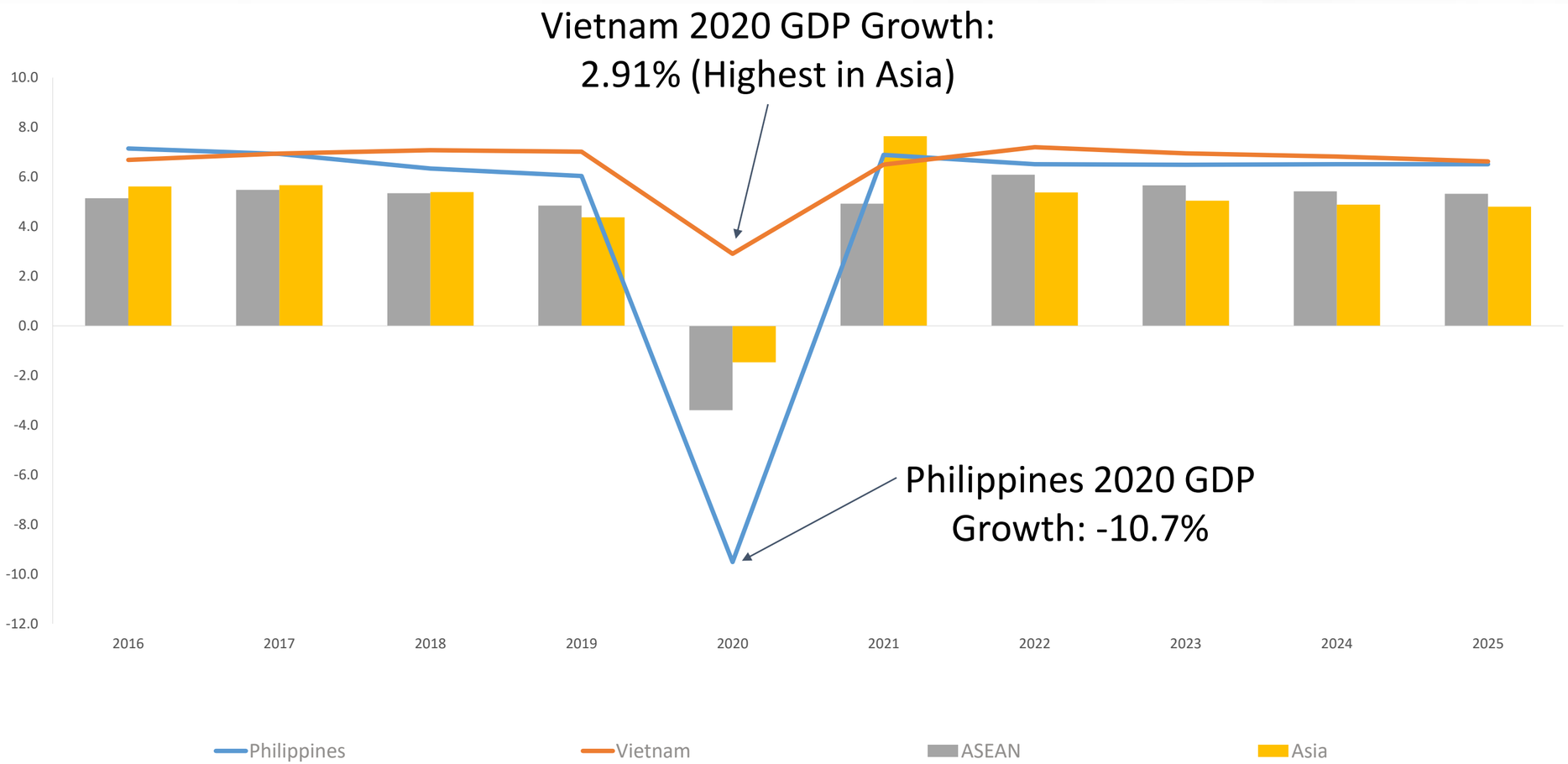
Fast growing populations and economies with significant industrial water sector challenges and opportunities!

But each opportunity is unique….

The Philippines and Vietnam - Differences

	Vietnam	Philippines
Political System	Single Party Socialist	Constitutional Democracy
History	Long Independence with Brief Colonial Period (France)	Long Colonial Period (Spain and US)
Culture	Non-Religious/ Eastern/ Lunar Calendar	Roman Catholic with Strong Western Influences
Wealth	New Money	Old Money held by Few Families
Business Culture	Entrepreneurial	Corporate Culture
Language	Vietnamese is primary business language	English widely spoken and used as business language
COVID Response	<5,000 cases and GDP Growth in 2020	>1,100,000 cases and Significant GDP contraction in 2020

Comparative GDP Growth



Source: Asia and Pacific Regional Economic Outlook (APDREO) (04/09/2021)
Retrieved: 5/15/2021 7:27 AM from https://data.imf.org:443

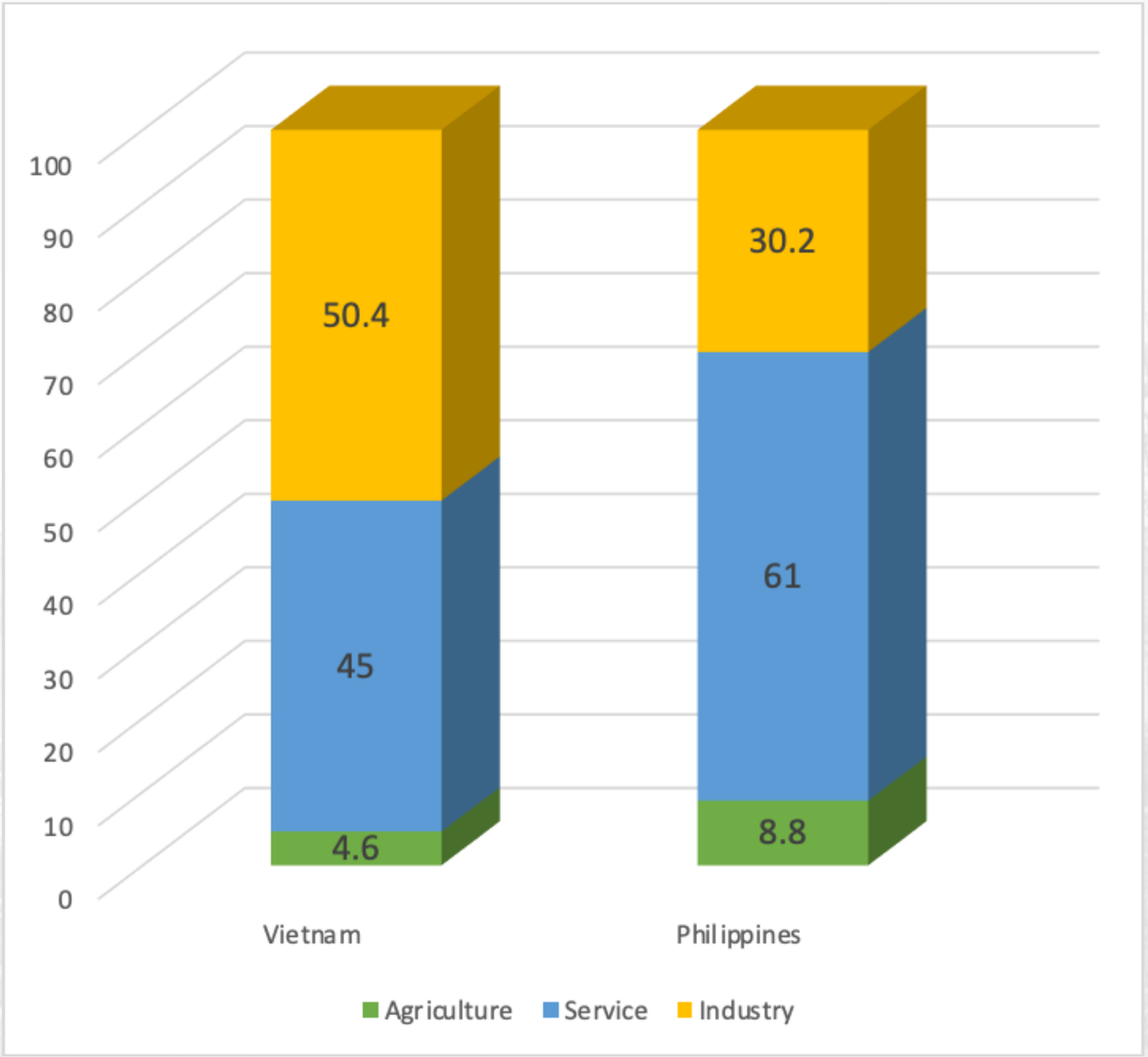
GDP by Sector and Exports (2019)

Vietnam

- Predominantly Industry (50.4%)
- 2019 Exports > $300 M US

Philippines

- Predominantly Service (61%)
- 2019 Exports < $100 M US

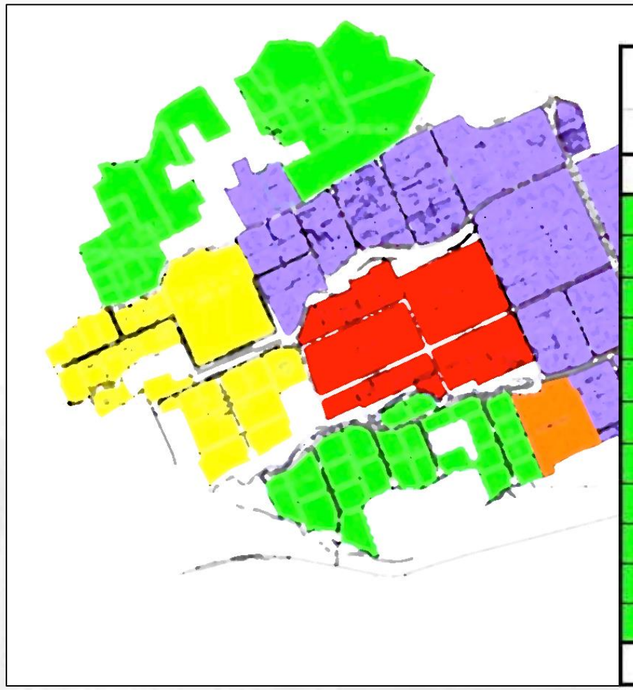


Source: IMF

The Philippines

Philippines – Business Opportunities

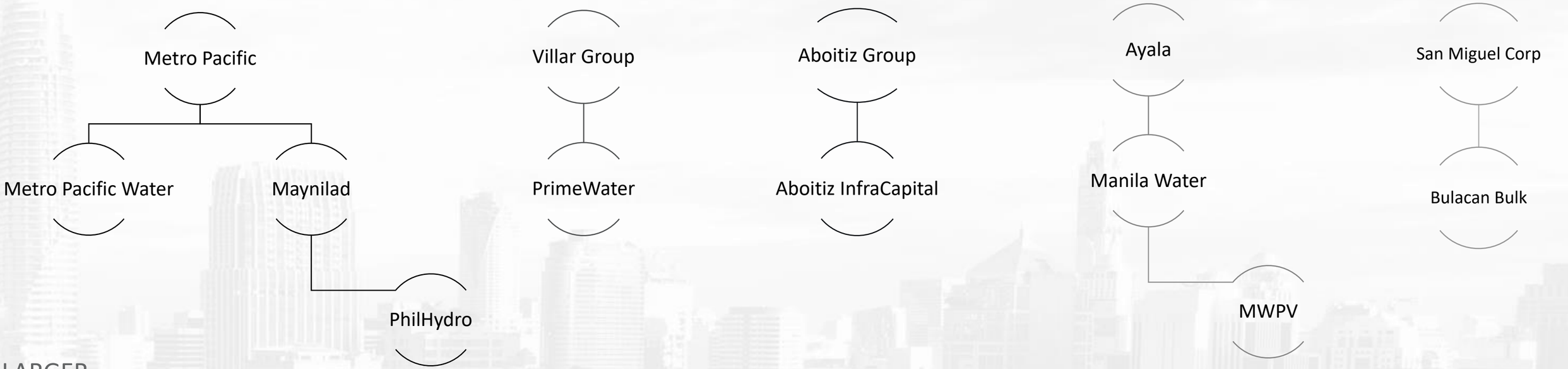
- Consulting/Advisory
  - Investment
  - Planning
  - Design
- EPC/Construction
- Technical/Equipment Solutions
  - Groundwater – Iron, Manganese, Arsenic (Volcanic Activity)
  - Desalination
  - NRW
  - Wastewater Nutrient Removal
- Investment
  - Only as partner to local investor



ARSENIC			
PNSDW Limit 0.01mg/L			
2017	2018	2019	2020
0.005	<0.0009	0.012	0.014
0.008	<0.0009	0.021	0.026
0.010	<0.0009	0.024	0.294
<0.0009	<0.0003	0.022	0.274
0.007	<0.0009	0.106	0.133
0.002	<0.0009	0.013	0.016
<0.0009	<0.0009	0.012	0.014
0.007	0.010	0.016	0.020
0.007	0.009	0.015	0.018
<0.0009	0.009	0.012	0.014
0.006	0.016	0.014	0.017

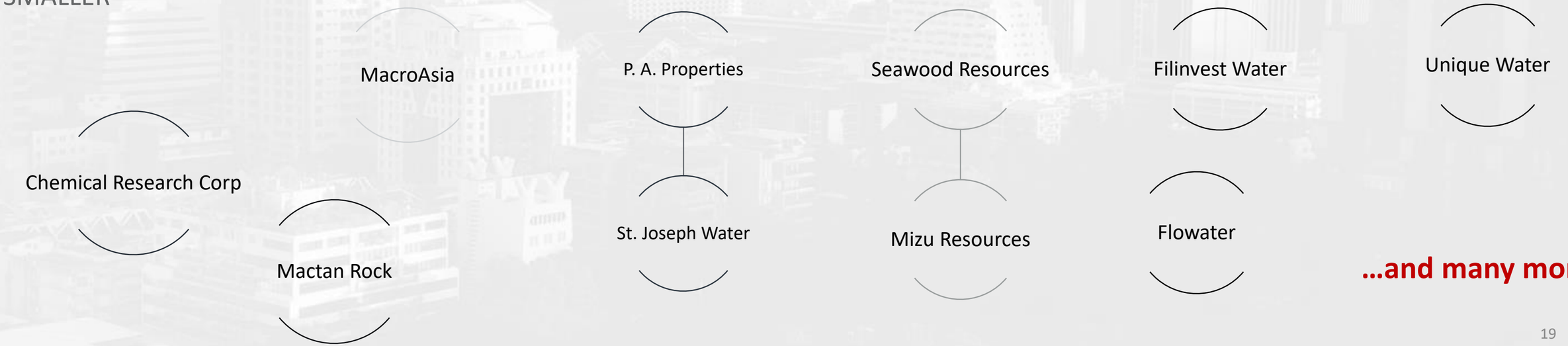
More than 85,000 manufacturing industries in the Philippines – 52% in Metro Manila

Private Water Sector Investors in the Philippines



LARGER

SMALLER



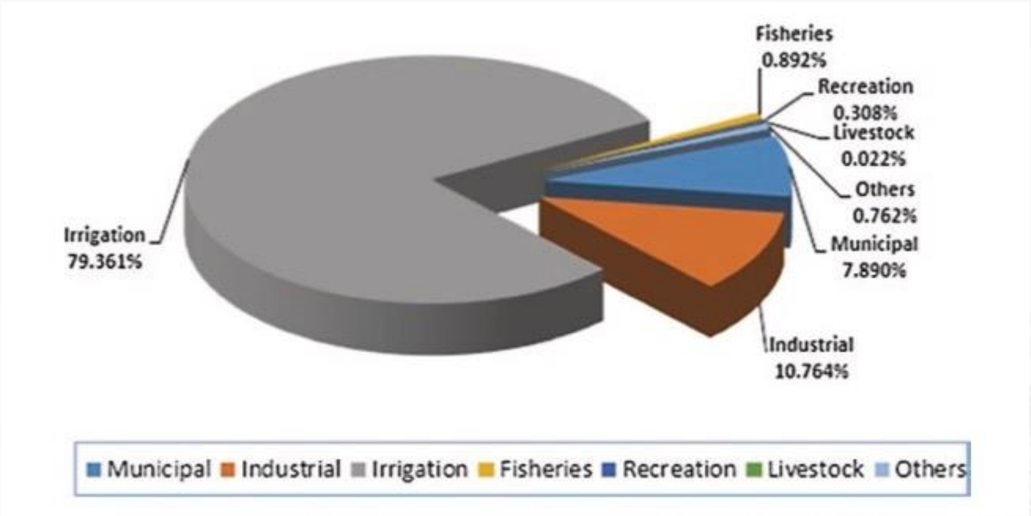
…and many more

Philippines – Industrial *(Private)* Water Sector Technical Opportunities

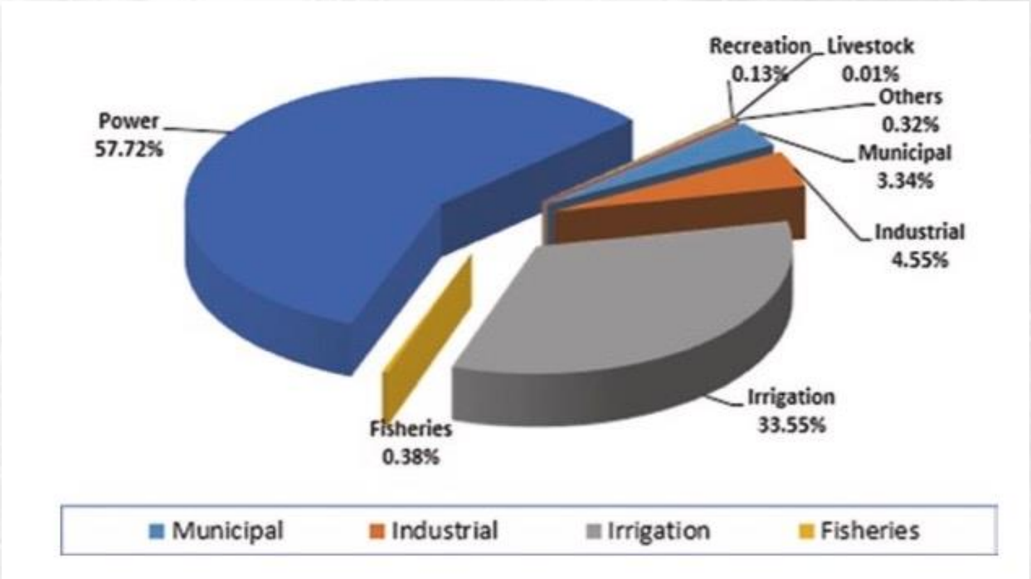
- **Water Supply**
  - **Identification and development of supply**
- **Water Treatment**
  - **Desalination**
  - **Conventional surface water**
  - **Iron, Manganese, Arsenic**
  - **Point-of-Entry Treatment**

Industrial water tariffs vary significantly based on location:

- Low S$0.055/$m^3$ (2 PhP/m^3)
- High S$2.40/$m^3$ (86.6 Php/m^3) [Metro Manila]



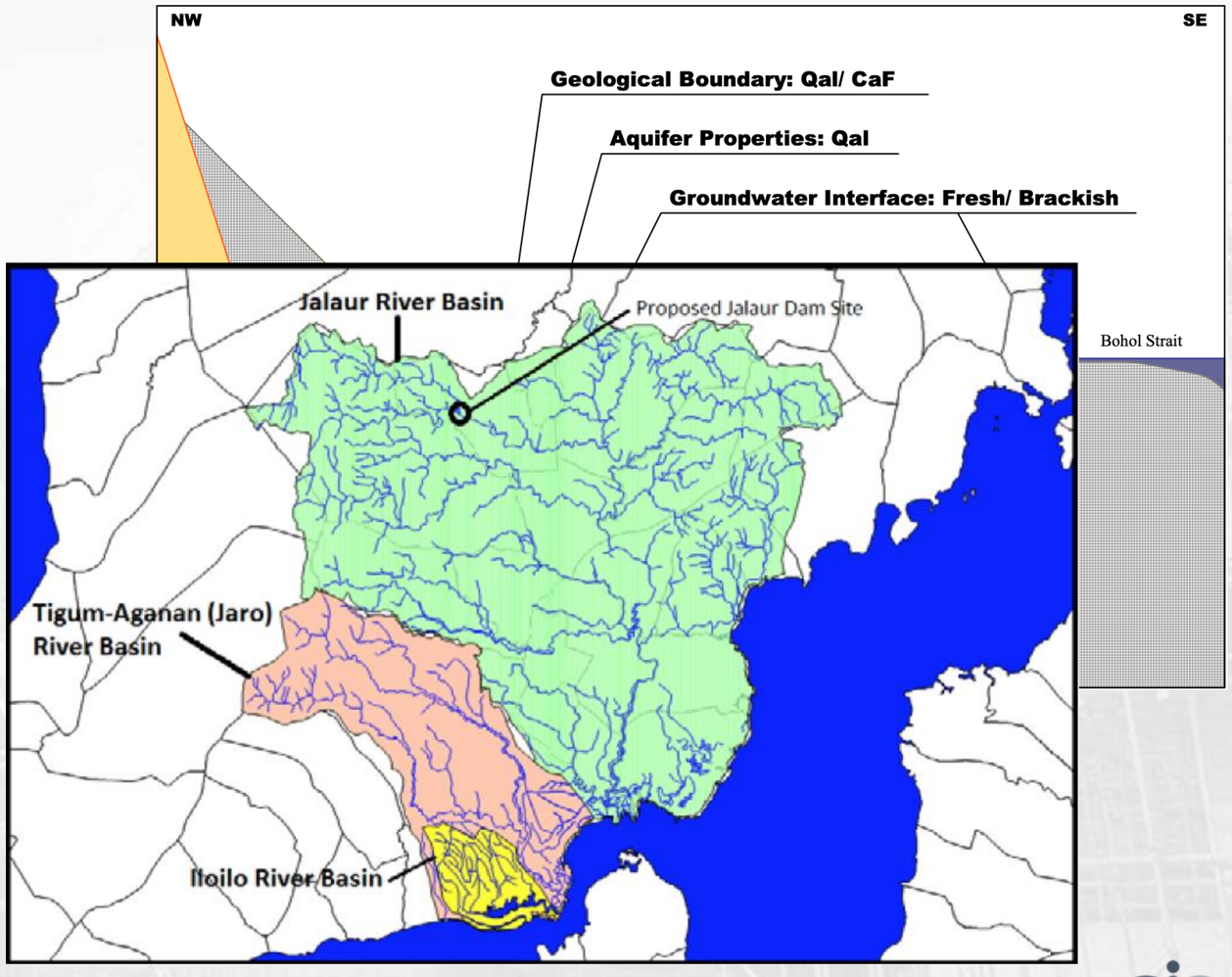
Consumptive water use in the Philippines (NWRB/Migo 2018)



Non-consumptive water use in the Philippines (NWRB/Migo 2018)

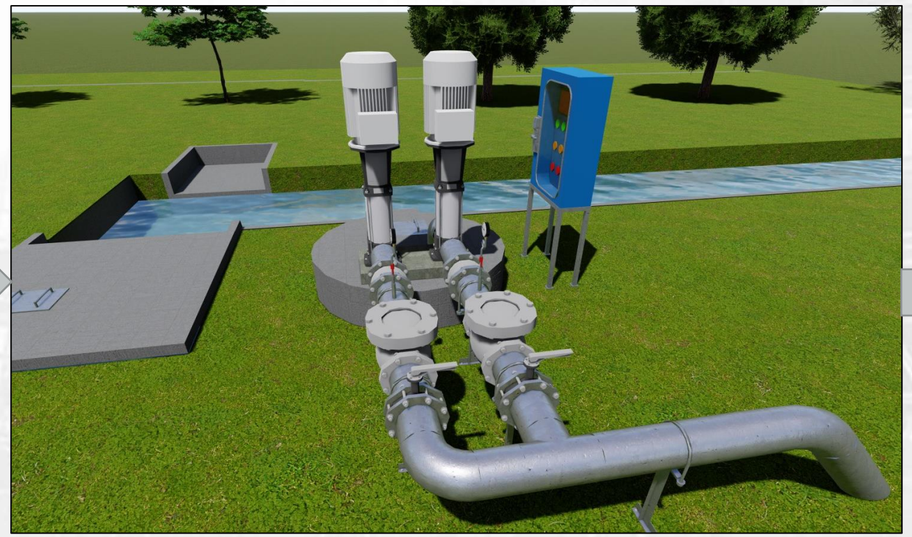
Desalination – Water Water Everywhere - but Not a Drop for Water Supply

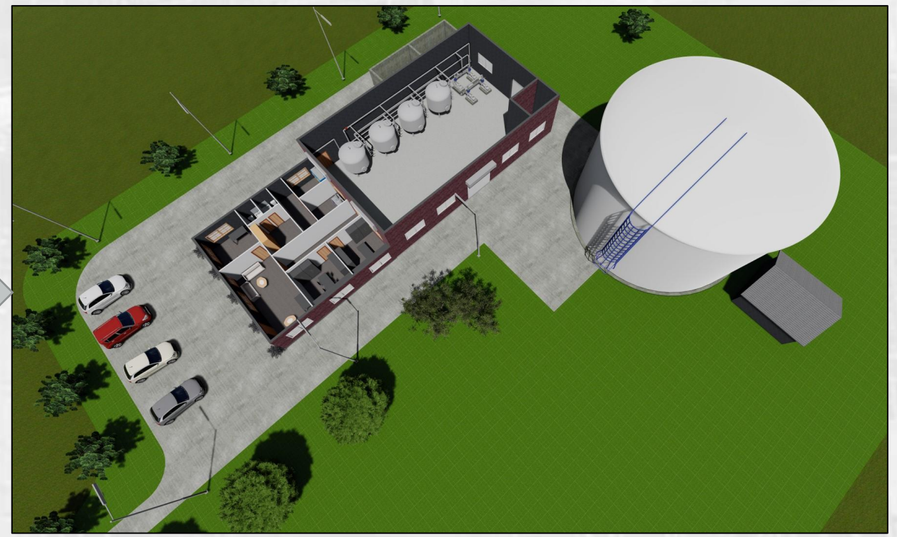
- Most of the urban population centers in the Philippines are facing water supply stress, which not only effects municipal supply, but greatly effects the industrial sector, the power sector, the tourism sector, etc.
- Increasingly, these businesses are turning to seawater and brackish supplies for water
- As are the water districts for bulk supply
- Expertise is needed in this sector



Industrial Water Source Development and Treatment - Case Study

Due to low prioritization of industrial water supply (6th in Government Priority), water sources for industrial use are scarce and often require unique treatment solutions. This project utilized a spring supply that was contaminated by many discharges and uses.

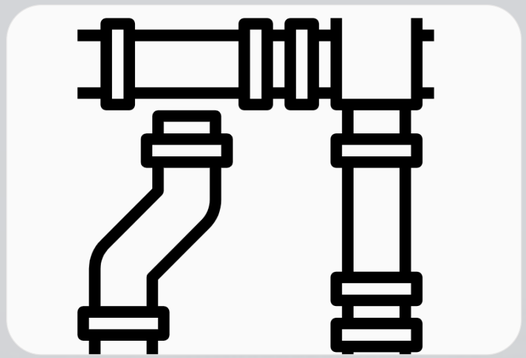




Philippines – Industrial *(Private)* Water Sector Technical Opportunities

- Water Supply
  - Identification and development of supply
- Water Treatment
  - Desalination
  - Conventional surface water
  - Iron, Manganese, Arsenic
  - Point-of-Entry treatment
- **Water Distribution**
  - **Non-revenue water management**

NRW Case Study - Mixed-Use Private Estate Water System Performing AI-learning NRW Reduction Pilot

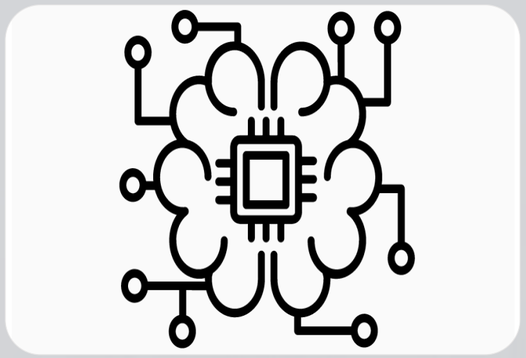


Client Background

- Water Provider for **16 estates** in Luzon
- Supplies 11 MLD
- **Low overall NRW**, but has some areas with "*negative*" NRW
- NRW can go high as **55%** in some of the systems

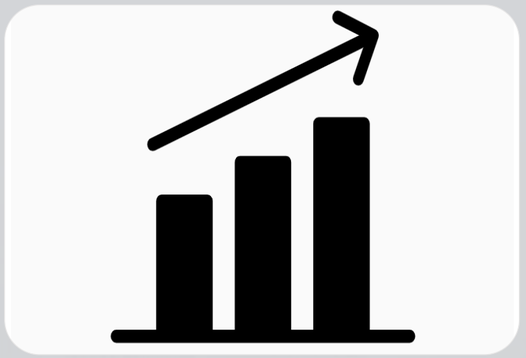
NRW Objectives of Client

- Improve NRW Management
- Network/Asset Management
- Billed Volume/ Revenue Optimization



Pilot of AI-Learning NRW Reduction System

- Self learning system
- Can reduce commercial and physical losses
- Minimal personnel training and human intervention
- Improves leak detection efficiency and determines likelihood of failure



Progress of Partnership

- Establishment of baselines
- Improved asset management and data analysis
- Integration to workflows

Philippines – Industrial *(Private)* Water Sector Technical Opportunities

- Water Supply
  - Identification and development of supply
- Water Treatment
  - Desalination
  - Conventional surface water
  - Iron, Manganese, Arsenic
  - Point-of-Entry Treatment
- Water Distribution
  - Non-revenue water management
- **Wastewater Treatment**
  - **Agricultural**
  - **Food/beverage**
  - **High tech**
  - **Focus on Nitrogen and Phosphorus Removal**
  - **Monitoring of influent in Industrial Parks (and for concessions)**

Industrial discharge on Mactan Island, Cebu

Industrial wastewater accounts for 30% of pollutant loads in the Philippines

Philippines DAO 2016-08

Comparison of old and new regulations for Bodies of Water classified as Class C – Class A/B are even more stringent

for recreational, fishery, and agricultural purposes

Significant opportunities for nitrogen and phosphorus removal technologies that can be “add on” systems for existing WWTPs

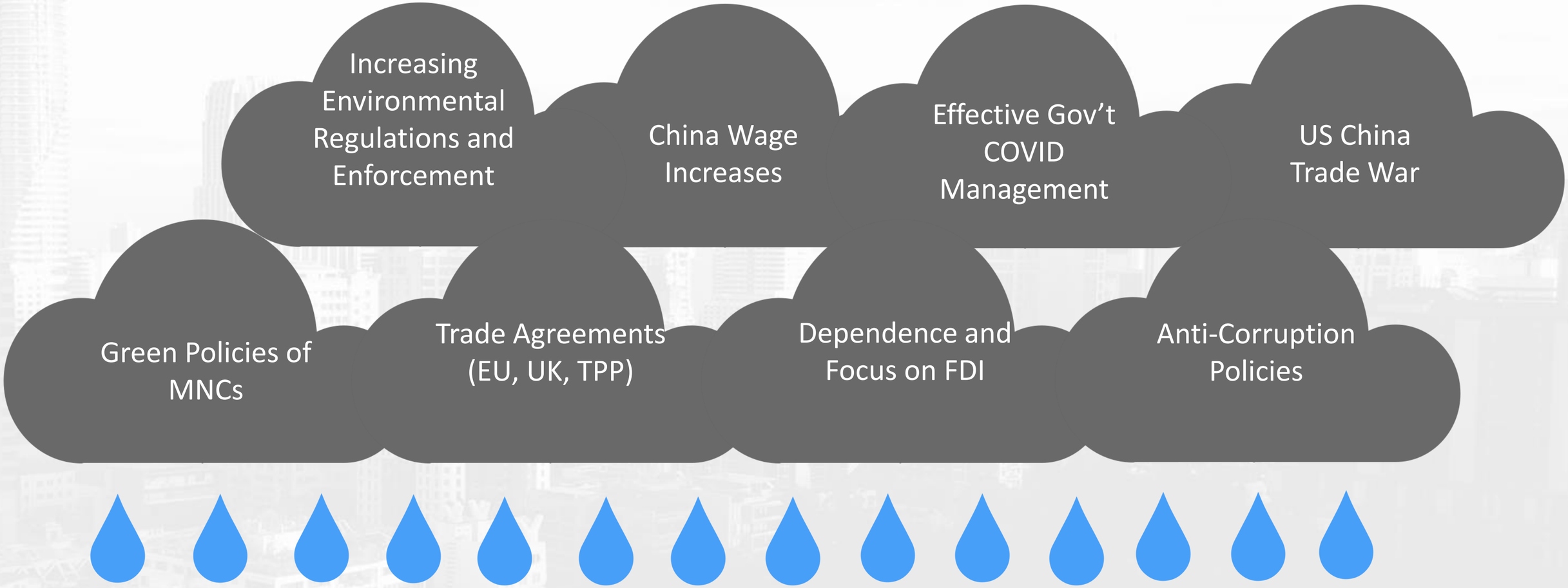
Significant Effluent Parameters	unit	Effluent Standards for Class C	
		DAO 1990-35 (old regulation)	DAO 2016-08 (new regulation)
BOD	mg/L	50	50
COD	mg/L	100	100
TSS	mg/L	70	70
Oil and Grease	mg/L	5	5
Color	TCU	150	150
Total Coliform	MPN/100ml	10,000	10,000
Fecal Coliform	MPN/100ml	None	400
Ammonia as NH3-N	mg/L	None	0.5
Nitrate as NO3-N	mg/L	None	14
Phosphate	mg/L	None	1
Surfactants (MBAS)	mg/L	None	15

Doing Business in the Philippines

- Many Options for Doing Business:
  - As a foreign company (consulting or import)
    - If importing you will need local distributor or resident agent
  - Representative office (marketing only)
  - Branch – with local business license
  - Local company - and can joint venture with local partners
  - Consortium with local partner for single project
- Negative List – Be aware of what CANNOT be done by a foreign entity or can only be done with limited foreign ownership.
  - Public utility limit in the Philippines – 49% Foreign
- PPP – key legal frameworks
  - NEDA JV Guidelines
  - BOT Law
  - Government Procurement Act
- Corporate Governance - Be aware and pass down corporate policies to your local partners.

Vietnam

Vietnam – A Perfect Storm for the Manufacturing Sector

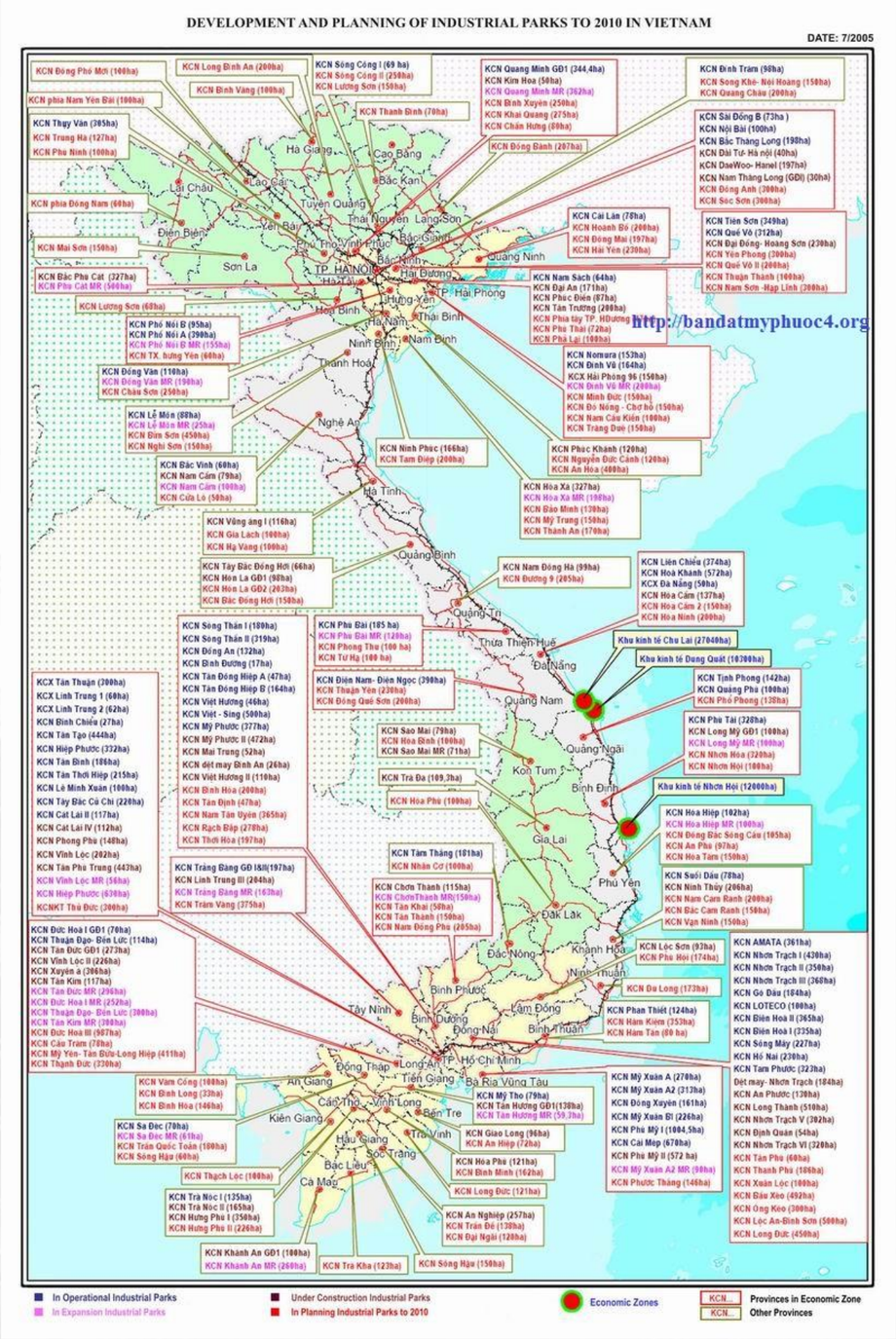


Unprecedented Opportunities in the Industrial Water Sector

Vietnam – Business Opportunities

- Investment
  - Water/WW Project (50 Year BOO)
  - Combined Sector (Water +)
- Technical/Equipment Solutions
  - Industrial wastewater
  - Recycling
  - Water supply – particularly desalination
  - Testing and Monitoring
- Consulting/Advisory
  - Investment
  - Planning
  - *Less design opportunity (design typically done by solution provider)*

More than 200 Existing Industrial Zones in Vietnam – with Plans to Expand to more than 300



Vietnam – Investment Opportunities

In the Industrial Sector, there are opportunities to Invest in:

- Bulk Water Supply
- Wastewater Treatment (IP Level)
- Recycling (IP Level)

50-year BOO is Common

Vietnam – Investment Opportunities (Tariffs)

In the Industrial Sector, there are opportunities to invest in:

- Bulk Water Supply
- Wastewater Treatment (IP Level)
- Recycling (IP Level)

WATER SUPPLY = S$0.60/$m^3$

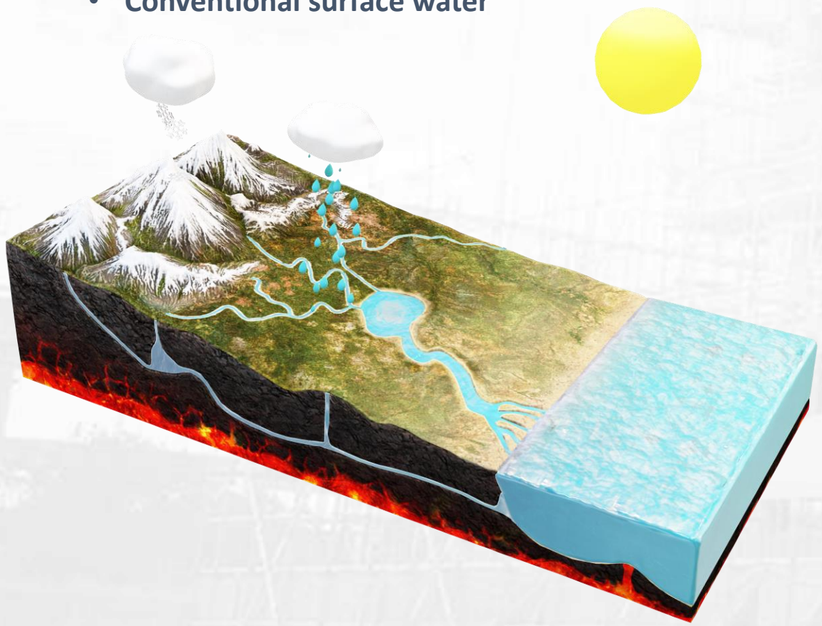
WASTEWATER TREATMENT = S$0.65 to S$1.50/m^3

WASTEWATER RECYCLING = S$0.55/$m^3$

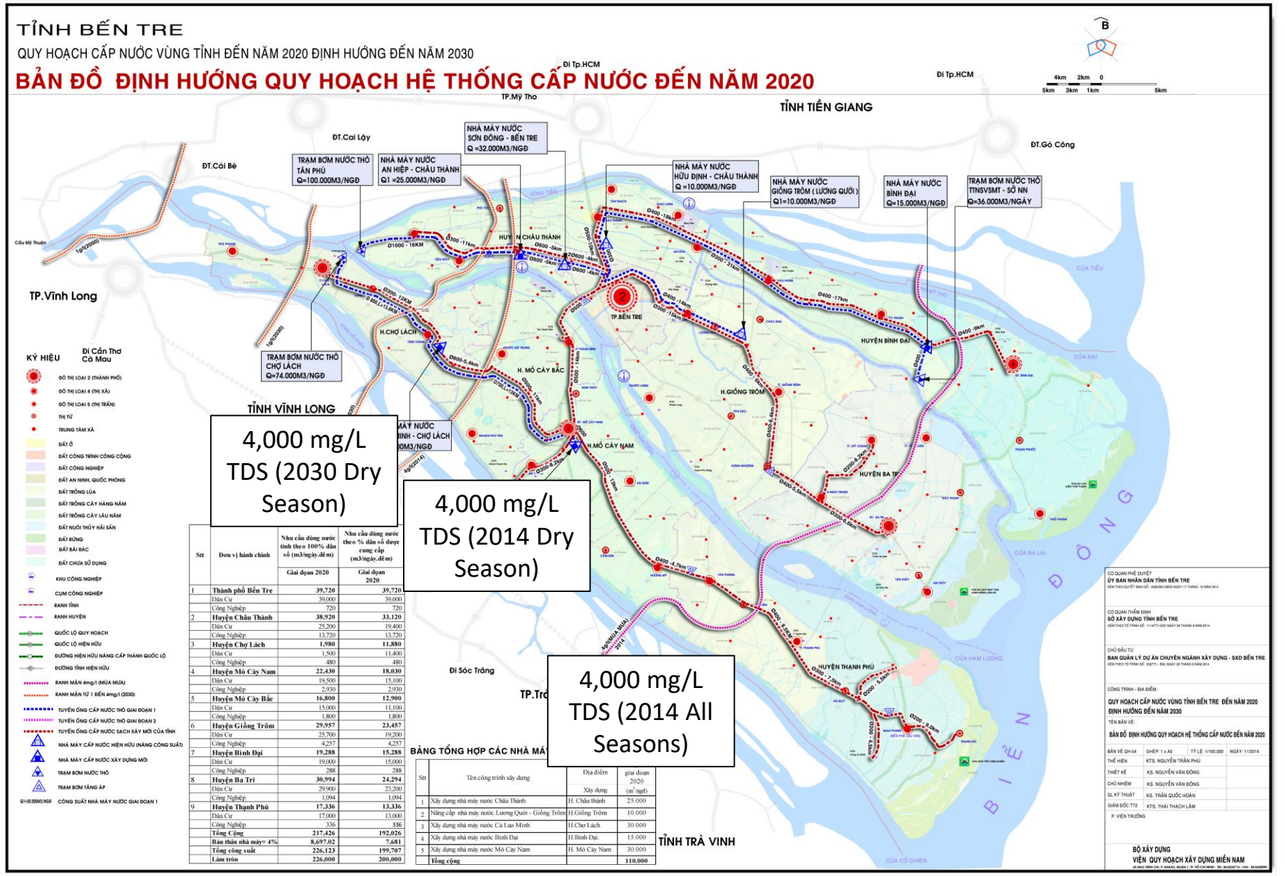
WASTEWATER TREATMENT + RECYCLING = S$1.20 to S$2.05/m^3

Vietnam – Industrial Water Sector Technical Opportunities

- Water Supply
  - Mitigation of salinity intrusion
  - Water supply development
  - Water quality monitoring
- Water Treatment
  - Desalination
  - Conventional surface water

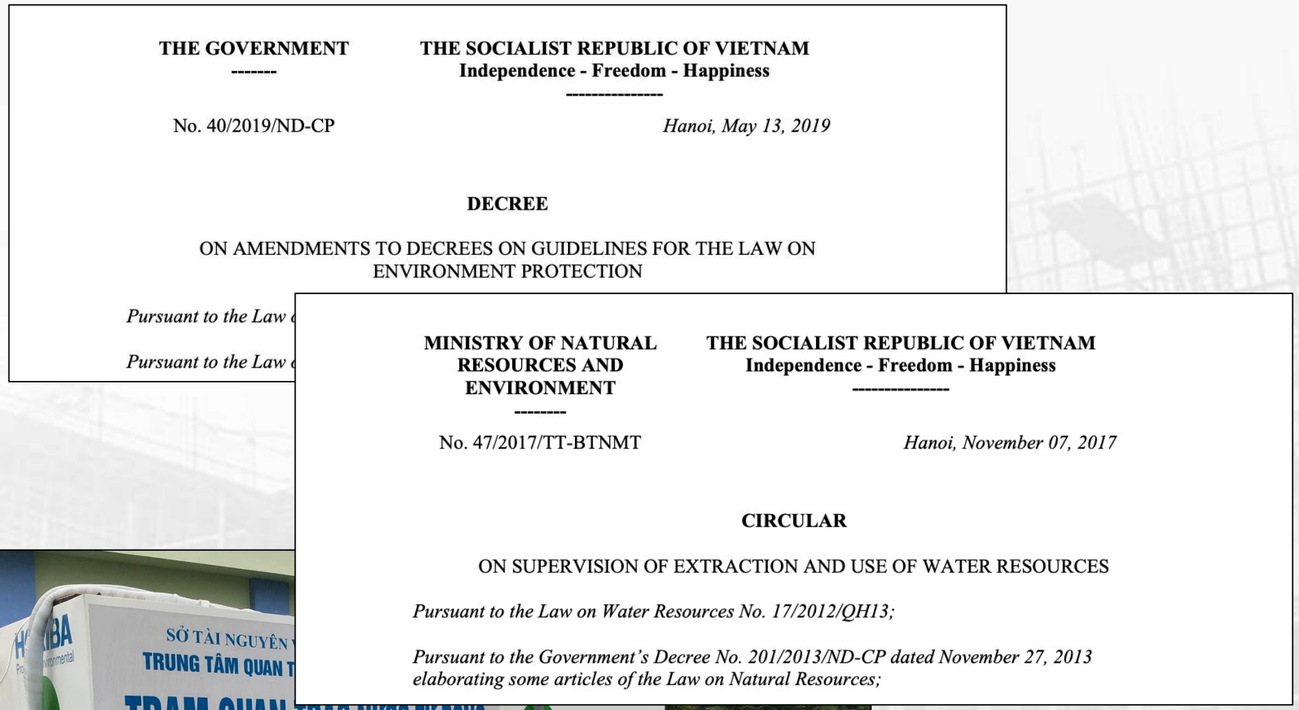


Salinity Levels in Ben Tre Province



Water Quality Monitoring – Raw Water and Wastewater Influent/Effluent

- Food industry (and municipal) sector focused on agricultural pollutants
- Regulatory requirement for monitoring of reservoirs for any use (power sector, etc.)
- Regulatory requirement for continuous monitoring of wastewater effluent – even for relatively small systems
- Increasing focus on industrial wastewater dischargers to centralized WWTPs



THE GOVERNMENT

THE SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

No. 40/2019/ND-CP

Hanoi, May 13, 2019

DECREE

ON AMENDMENTS TO DECREES ON GUIDELINES FOR THE LAW ON ENVIRONMENT PROTECTION

Pursuant to the Law

Pursuant to the Law

MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

THE SOCIALIST REPUBLIC OF VIETNAM
Independence - Freedom - Happiness

No. 47/2017/TT-BTNMT

Hanoi, November 07, 2017

CIRCULAR

ON SUPERVISION OF EXTRACTION AND USE OF WATER RESOURCES

Pursuant to the Law on Water Resources No. 17/2012/QH13;

Pursuant to the Government's Decree No. 201/2013/ND-CP dated November 27, 2013 elaborating some articles of the Law on Natural Resources;

Vietnam – Industrial Water Sector Technical Opportunities

- Water Supply
  - Mitigation of salinity intrusion
  - Water supply development
  - Water quality monitoring
- Water Treatment
  - Desalination
  - Conventional surface water
- **Wastewater Treatment**
  - **Textile**
  - **Food/beverage**
  - **High tech (Samsung and planned facilities)**
  - **Aquaculture**
  - **Influent quality monitoring**

Wastewater Effluent Standards (2011 vs Proposed 2021)

CỘNG HÒA XÃ HỘI CHỦ NGHĨA VIỆT NAM

QCVN 40:2021/BTNMT

(DỰ THẢO 201207)

QUY CHUẨN KỸ THUẬT QUỐC GIA VỀ NƯỚC THẢI CÔNG NGHIỆP

National Technical Regulation on Industrial Wastewater

HÀ NỘI - 2021

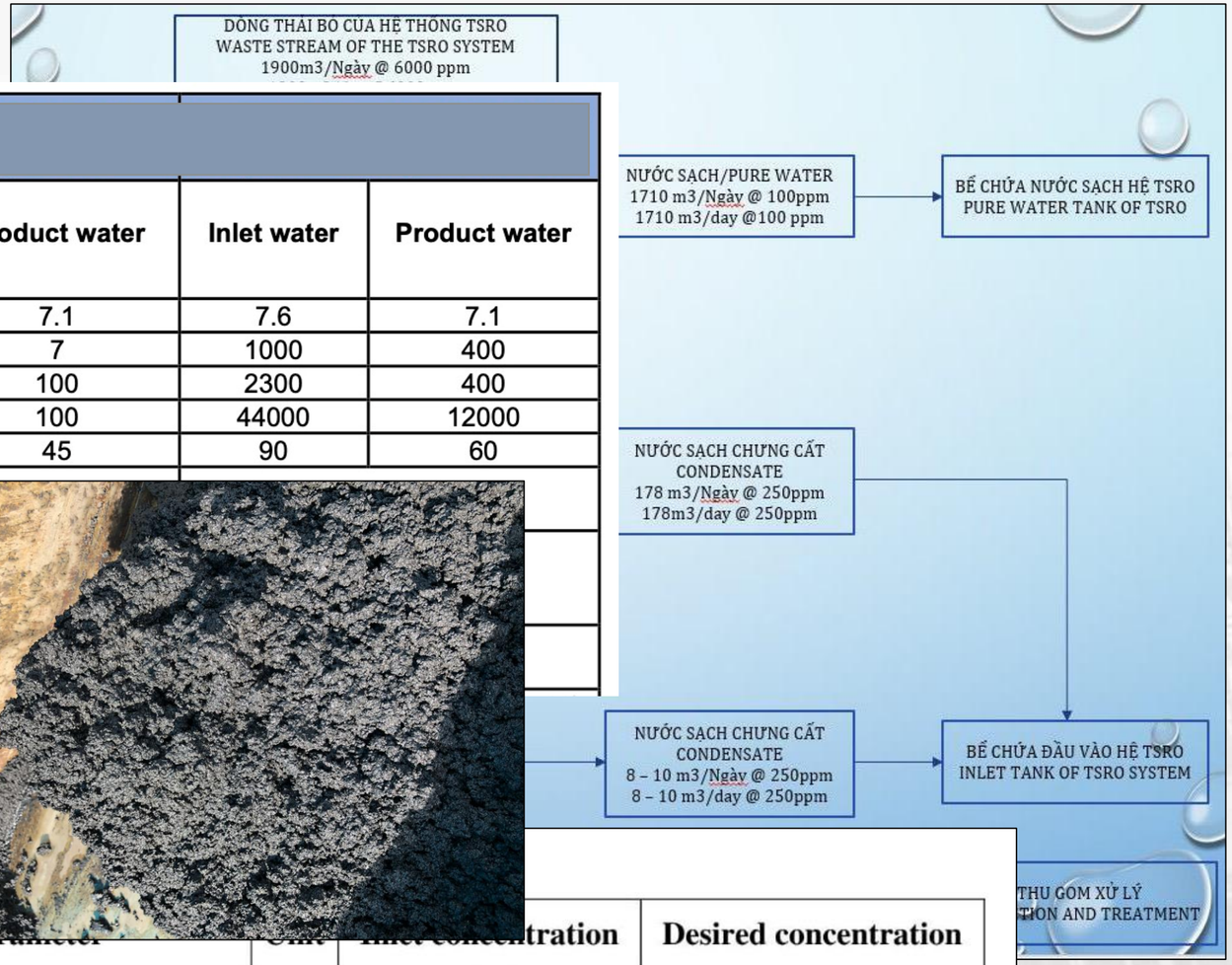
Parameter	Unit	QCVN 40:2011/BTNMT Column B (NT6 WWTP Discharge Permit)	QCVN 40:2021/BTNMT Column B	Variance (Column B 2011 vs 2021)	QCVN 40:2011/BTNMT Column A	QCVN 40:2021/BTNMT Column A	Variance (Column A 2011 vs 2021)
Temperature	deg C	40	40	0	40	40	0
Color	Pt-Co	121.5	100	-21.5	50	50	0
pH	-	5.5 - 9	6 – 9	0	6 – 9	6 – 9	0
BOD_5 (20°C)	mg/l	40.5	30	-10.5	30	25	-5
COD	mg/l	121.5	70	-51.5	75	40	-35
Total suspended solid (TSS)	mg/l	81	60	-21	50	30	-20
Arsenic	mg/l	0.081	0.1	0.019	0.05	0.05	0
Mercury	mg/l	0.008	0.005	-0.003	0.005	0.001	-0.004
Lead	mg/l	0.405	0.5	0.095	0.1	0.1	0
Cadmium	mg/l	0.081	0.1	0.019	0.05	0.02	-0.03
Chromium (VI)	mg/l	0.081	0.1	0.019	0.05	0.05	0
Chromium (III)	mg/l	0.81	1	0.19	0.2	0.2	0
Copper	mg/l	1.62	2	0.38	2	1	-1
Zinc	mg/l	2.43	3	0.57	3	1	-2
Nickel	mg/l	0.405	0.5	0.095	0.2	0.1	-0.1
Manganese	mg/l	0.81	1	0.19	0.5	0.5	0
Iron	mg/l	4.05	5	0.95	1	1	0
Total cyanide	mg/l	0.081	0.1	0.019	0.07	0.07	0
Total phenol	mg/l	0.405	0.5	0.095	0.1	1	0.9
Total mineral grease and oil	mg/l	8.1	5	-3.1	5	1	-4
Sulphur	mg/l	0.405	0.5	0.095	0.2	0.2	0
Fluoride	mg/l	8.1	10	1.9	5	3	-2
Ammonium (by N)	mg/l	8.1	10	1.9	5	5	0
Total nitrogen	mg/l	32.4	30	-2.4	20	20	0
Total phosphorus (by P)	mg/l	4.86	5	0.14	4	4	0
Chloride	mg/l	810	1000	190	500	500	0
Residual chlorine	mg/l	1.62	2	0.38	1	1	0
Total PCB	mg/l	0.008	0.003	-0.005	0.003	0.003	0
Coliform	MPN/100ml	5000	3000	-2000	3000	100	-2900
Total radioactive α	Bq/l	0.1	0.1	0	0.1	0.1	0
Total radioactive β	Bq/l	1	1	0	1	1	0

Specific Industrial Wastewater Challenges - Examples

Many focused on ZLD/MLD and others focused on specific pollutants or categories of pollutants

……and waste-to-value opportunities

Criteria				
	Inlet water	Product water	Inlet water	Product water
pH	7.1	7.1	7.6	7.1
EC($\mu s/cm$)	800	7	1000	400
TOC(ppb)	4900	100	2300	400
Silica (ppb)	8400	100	44000	12000
Flow (m^3/h)	90	45	90	60
Number of vessel				
Number of membranes per vessel				
Number of arrays				



Flow: 4

Parameter	Unit	Inlet concentration	Desired concentration
pH	-	3 - 5	-
Clorua (Cl^-)	mg/l	6.000 – 12.000	< 600
SO_4^{2-}	mg/l	Around 20.000	-
TSS	mg/l	< 1.000	-
Other ingredients: Smooth leather in water	-	-	-

Vietnam – Industrial Water Sector Technical Opportunities

- Water Supply
  - Mitigation of salinity intrusion
  - Water supply development
  - Water quality monitoring
- Water Treatment
  - Desalination
  - Conventional surface water
- Wastewater Treatment
  - Textile
  - Food/beverage
  - High tech (Samsung and planned facilities)
  - Aquaculture
  - Influent quality monitoring
- **Recycling**
  - **At factory level**
  - **At Industrial Park level**

Recycling Case Study – Textile IP Increased Recovery

Problem: High demand for recycled water due to sustainability policies of off-takers (factories) and due to increasing regulatory pressure for brine discharge.

Solution: Piloting of Osmotically Assisted RO (FTS H_20) in collaboration with Imagine H2O Asia for industrial park recycling facility in Central Vietnam (see more at SIWW).

Funded by:

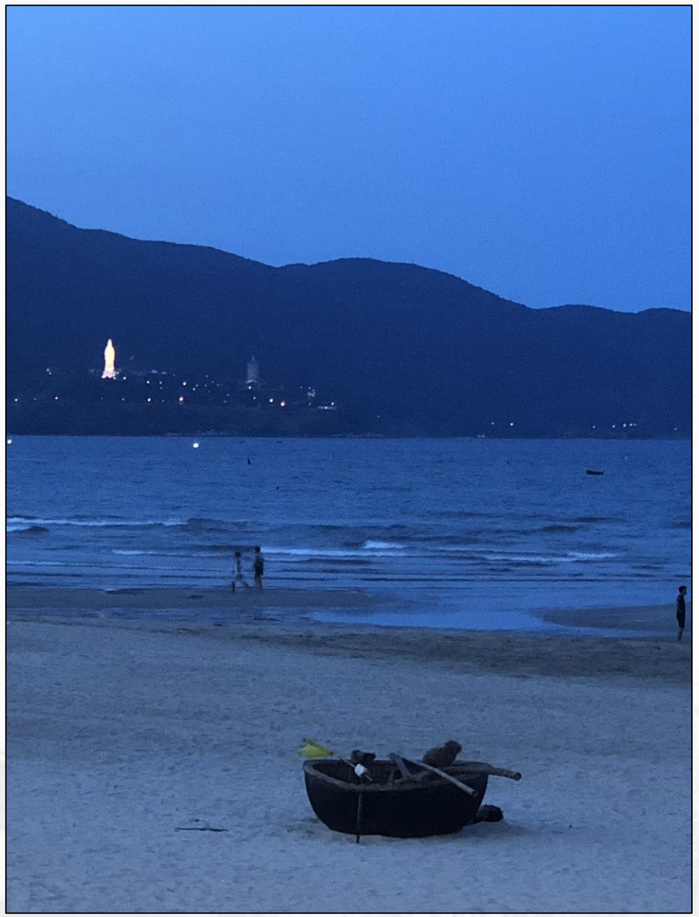
IMAGINE H_2O ASIA

FTS H_2O

Doing Business in Vietnam

- Many Options for Doing Business:
  - As a foreign company (consulting or import)
    - If importing you will need local distributor
  - Representative office (marketing only)
  - Branch
  - Local company (JSC most typical) and can joint venture with local partners
- Many tax advantages offered by the government in the water sector. Depends on what and how you are doing business. Can include:
  - Long deferments or tax breaks on corporate taxes
  - Elimination of import taxes and duties
- Vietnam is a Socialist State. Be aware of labor laws as the laws favour the employee and can be problematic if not set up correctly.
- Corporate Governance - Be aware and pass down corporate policies to your local partners.
- The Government of Vietnam has taken a strong stance on corruption in recent years

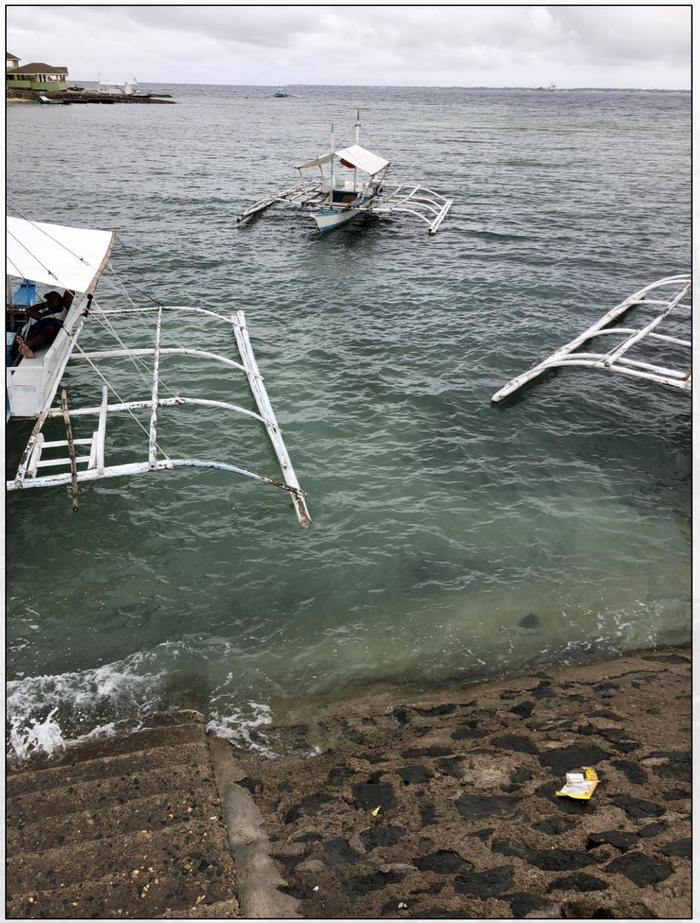
Summary



- Opportunities abound in both the Philippines and Vietnam in the Industrial/Private Sectors

- However, the business opportunities and the technical/sector opportunities differ between the two countries

- In both countries – relationships matter and local understanding is imperative



ardurra
international
strategic thinking • creative solutions

Thank you

Questions and Discussion

www.ardurrainternational.com
rchapin@ardurrainternational.com

[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

[Hosted by]

SWA
SINGAPORE WATER ASSOCIATION

[Presented by]

ardurra
international

[Supported by]

PUB SINGAPORE WATER EXCHANGE

[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

Upcoming

❖ **21 May 2021, 3pm to 4pm**

[SgWX Water Utilities Series]

Water Management & Strategies of the Metropolitan Waterworks Authority (MWA)

❖ **27 May 2021, 3pm to 4:30pm**

[Webinar] Storming Innovations with SIMTech

[Hosted by] SWA Singapore Water Association

[Presented by] ardurra international

[Supported by] PUB Singapore Water Exchange

[Industrial Water Series]

Sharing of water opportunities in industrial projects in Philippines and Vietnam

19 MAY 2021

SGT 4:00PM ~ 5:00PM

Thank You

For further queries on the webinar, please contact :

Singapore Water Association
T: (65) 65150812
E: enquiry@swa.org.sg
www.swa.org.sg

[Hosted by] SWA Singapore Water Association

[Presented by] ardurra international

[Supported by] PUB Singapore Water Exchange