

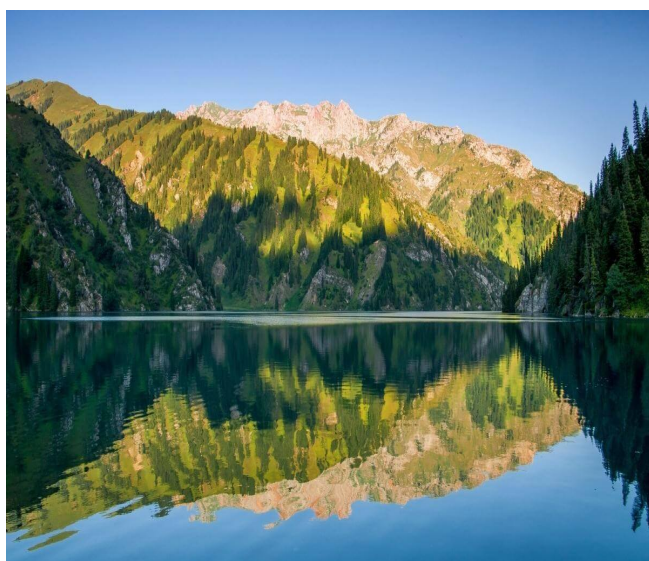
## **Potential of the Kyrgyz Republic for the production and export of bottled water**

Kyrgyzstan is a country of majestic Tien Shan and Pamir-Alai mountain ranges, occupying 90 percent of the territory of this most beautiful pristine corner with rugged relief, located in the heart of Central Asia. The amazing views of this region, where there are 29 mountain peaks over 4,000 meters high and 45 peaks over 3,000 meters high, have earned this land the fame of the “Country of Heavenly Mountains”.

In the Kyrgyz part of the Tien Shan mountains there are more than 2,000 high mountain lakes. Since ancient times, many legends about the origin of these picturesque natural mirrors have come down to us.

More than 8000 glaciers and eternal snows stretching over 8100 sq. kilometers, make up about 30% of the total area of Kyrgyzstan. Glaciers make up 4% of the country's territory.

Nature has generously endowed Kyrgyzstan with huge fresh water resources contained in vast glaciers, full-flowing rivers, large and small lakes and large groundwater reserves. The mountainous relief allows the formation and accumulation of fresh water reserves.



The total amount of available water reserves in Kyrgyzstan is estimated at 2458 km<sup>3</sup>, including 650 km<sup>3</sup> of water (26.4%) stored in glaciers, 1745 km<sup>3</sup> in lakes (71%), as well as 13 km<sup>3</sup> of potential underground fresh and mineral-thermal water reserves.

Only in glaciers contains about 6.5 trillion. liters of fresh water. This is approximately 20 times the global bottled water consumption per year.

Given the significant water resources of Kyrgyzstan, as well as the growing demand in the world for bottled water, this industry seems to be very promising and deserves special attention for development and investment.

The source of natural glacial water is located in an ecologically clean, protected foothill zone of the Ala-Kush tract, the Ala-Archa National Park at an altitude of 2100 meters above sea level, which guarantees crystal purity and pristine taste and is considered unique. During the year, its chemical composition practically does not change. The water is lively, soft, saturated with minerals and practically devoid of natural salts.

Water is an excellent source of life activity. The low composition of mineralization makes the water ideal for daily consumption. Quenching your thirst with this water, you can not be afraid of the accumulation and deposition of mineral salts in the body. Water of melting ice, carrying the information of eternal spring and prosperity.

The flow rate of the natural water source (water content) is 4,320 cubic meters per day or 4,320,000 liters / day.

Even if 70% of this volume is used, 756 million liters of bottled water can be produced per year for the amount of 18.9 billion soms or \$225 million.

In 2021, the total export of bottled water from Kyrgyzstan amounted to \$226,000.

The potential of only one source of natural glacial water is 1000 times greater than the total export of bottled water.

**The equipment for the plant can be divided into three components:**

- 1) equipment for purification and disinfection of water;
- 2) a line for bottling water into PET bottles;
- 3) equipment for the production laboratory.

**Water purification and disinfection equipment**

The water treatment process can be divided into three parts: pre-treatment, advanced treatment and final treatment.

The pre-treatment system consists of multi-layer filters with quartz sand and activated carbon, softeners and filters to remove iron and manganese.

Advanced processing includes reverse osmosis membrane treatment.

The final treatment includes disinfection with ultraviolet and ozone.

**Quartz sand filter**

Removes organic matter, microorganisms, chlorine and some heavy metal ions.

**Activated carbon filter**

Used to filter chlorine in water  $<0.1$  PPM and has a significant effect on odor, organic matter, colloid and iron in water.

**Sodium ion exchanger/water softener**

Used to remove calcium and magnesium ions from water, thereby softening the water.



*Pic.1 Water filter system*



*Pic.2 Reverse Osmosis Cleaning Equipment*

Reverse osmosis technology is the most modern method that uses the principle of water molecules passing through a semi-permeable membrane under the influence of external pressure. With the help of the reverse osmosis process, it is possible to get rid of 98% of impurities dissolved in water (in industrial installations, the figure can reach 100%).

Filters with reverse osmosis technology are used to obtain drinking water from polluted or saline sources, as well as to solve industrial problems.

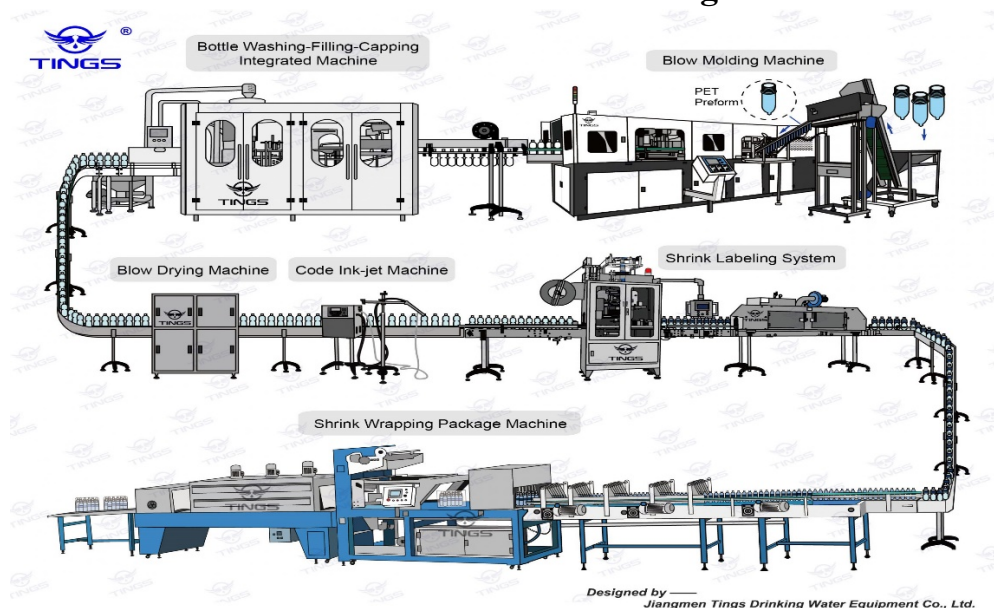
Most UV water disinfection plants use low mercury pressure lamps. When operating at this wavelength, water softens.

Pathogenic microorganisms can harm the human body only if they multiply in the body; when water is disinfected with ultraviolet light, this ability is lost and, as a result, any negative effect of microorganisms is excluded.



*Pic.3 UV sterilizer*

## Water bottling line



*Pic.4 Water bottling line*



The water bottling line includes the following equipment:

1. PET bottle making machine;



*Pic.5*

2. 3 in 1 water filling machine: rinsing, filling, capping;



*Pic.6*



*Pic.7*

3. Labeling machine;



*Pic.8*

#### 4. Packing machine



*Pic.9*



# Drinking Water Treatment & Bottling Process for Export

Water Cluster Export Strategy using Eco-friendly Kyrgyzstan Environment

2022.06



**In Water Solution Agro**

General Director of IWS Agro / Professor of SKKU  
/ Adviser of Prime Minister's Officer in Kyrgyzstan

**KIM, Ji-Hoon**





# Contents



**Bottling Process**



**Drinking Water Treatment**



**Export Strategy**





# Bottling Process





- Total Bottling Process
  - | 1<sup>st</sup> Step : Drinking Water Treatment Process
  - | 2<sup>nd</sup> Step : Bottling Process



## ● Whole Procedure of Bottling Process (PET bottle base)

Water Intake



Water Storage



Water Treatment



End Product Delivery



End Product Packing



End Product Transfer



Cap Production



Bottling Forming



Filtrate Injection



Bottling Inspection



Label Attaching



Shrink Wrapping



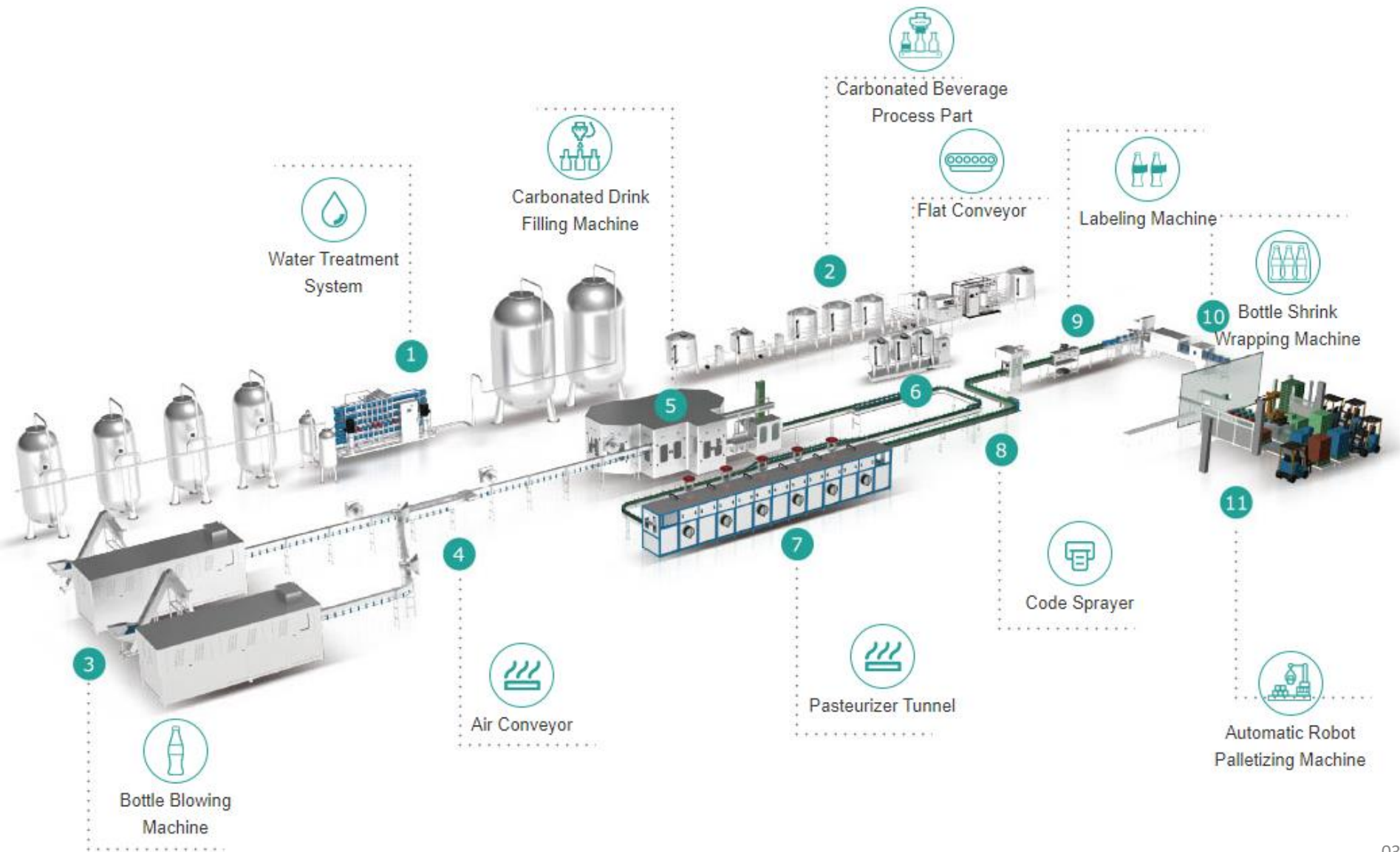
Knob Attaching





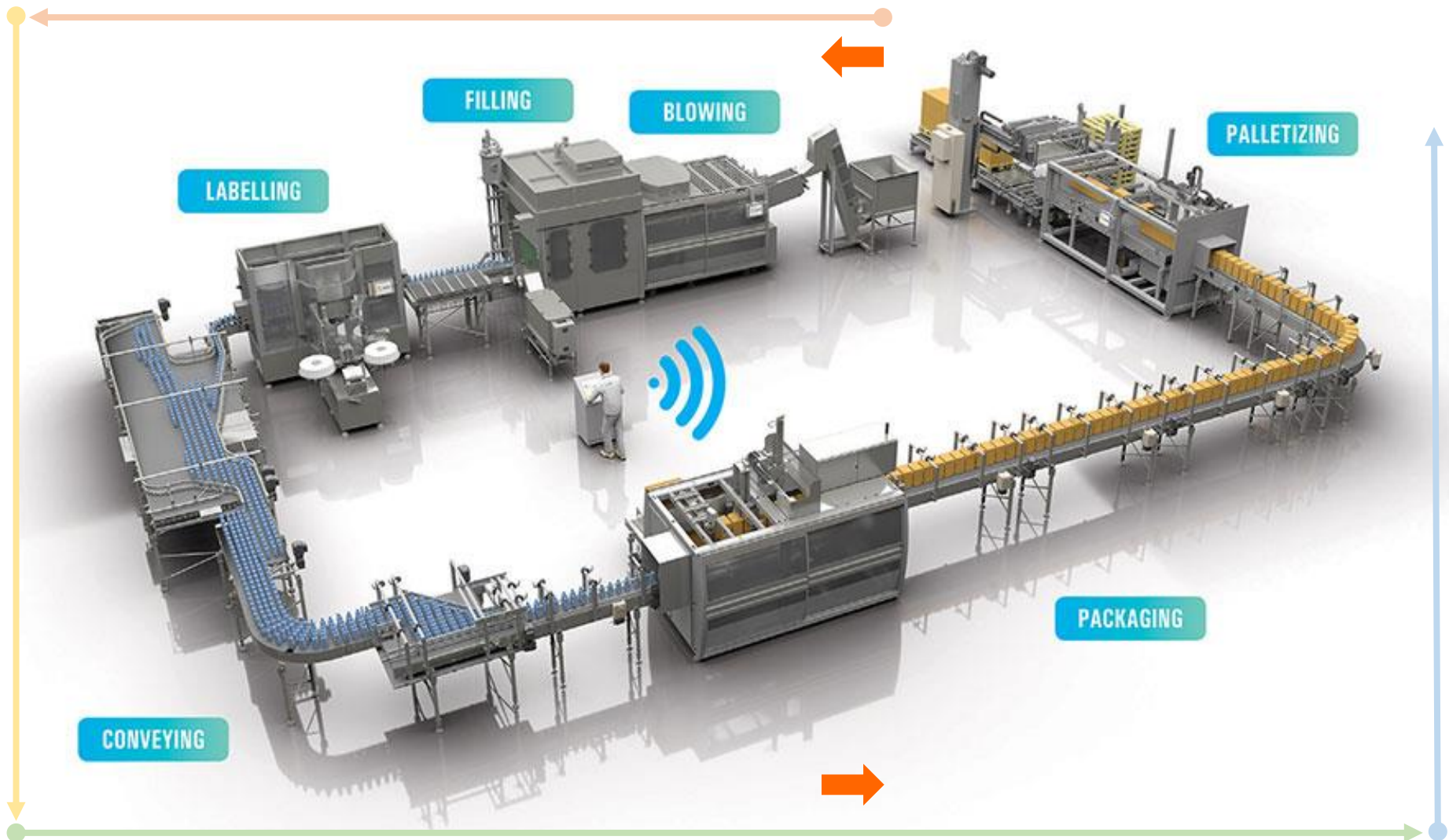
# Bottling Process

- Whole Procedure of Bottling Process (Carbonated Water + PET bottle base)

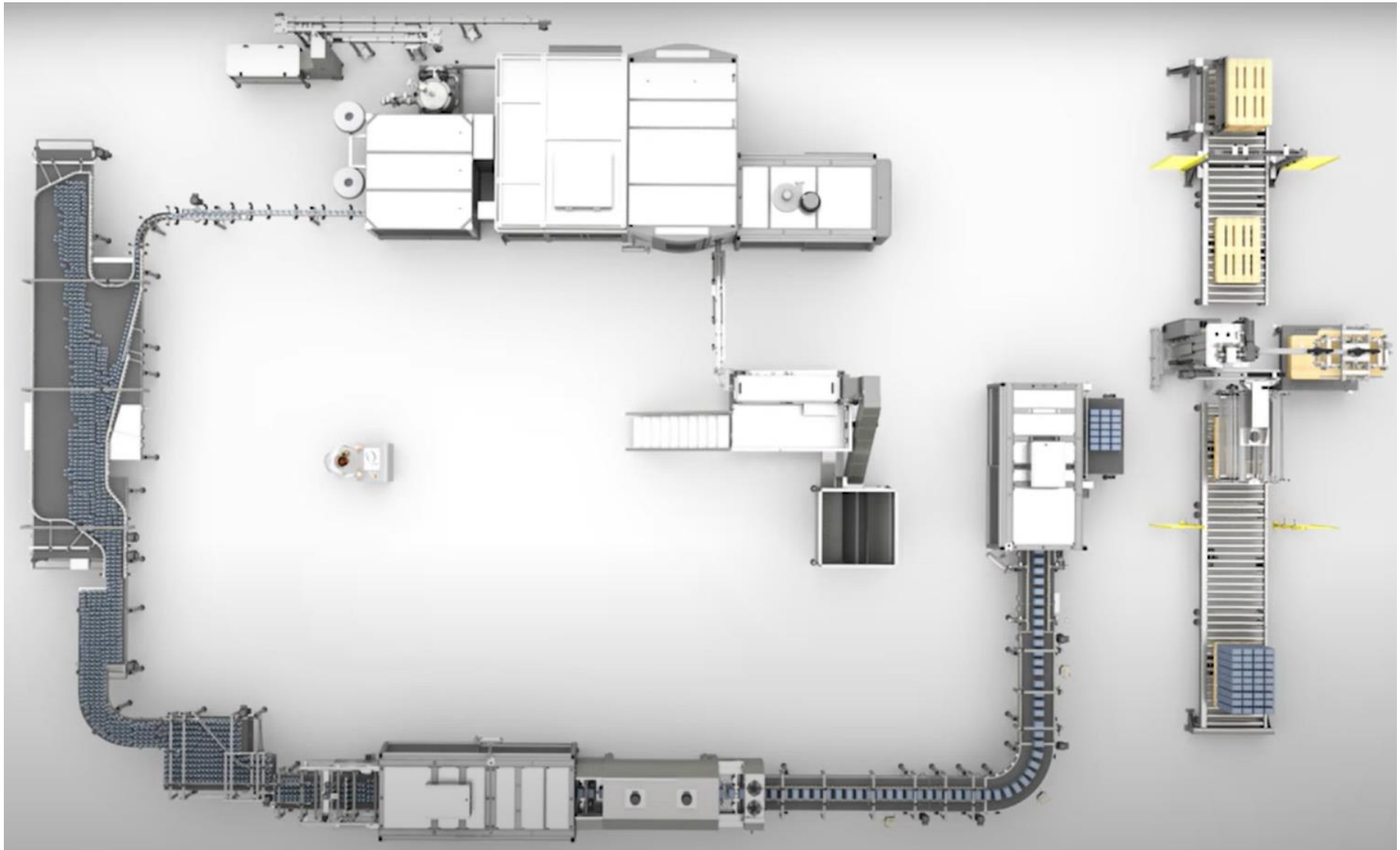


# | Bottling Process

- 2<sup>nd</sup> Step : Bottling Process (**Main Process**)



- 2<sup>nd</sup> Step : Bottling Process (**Main Process**)





# Bottling Process

- PET making Process : Preform Injection Mold, Blow Mold, Blow Machine



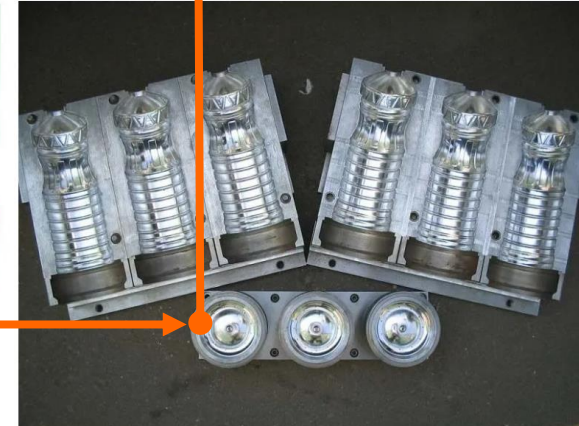
코어  
Core part



캐비티  
Cavity part



하트러너  
Hot runner part



- Bottling Main Equipment (PET base)

**Bottle Unscrambler**



**Blowing Machine**



**Filling Machine**



**Automatic Thermal Shrink Packing Machine**



- Bottling Main Equipment (PET base)

Single Side Sticker Labeling Machine



Shrink sleeve labeling machine

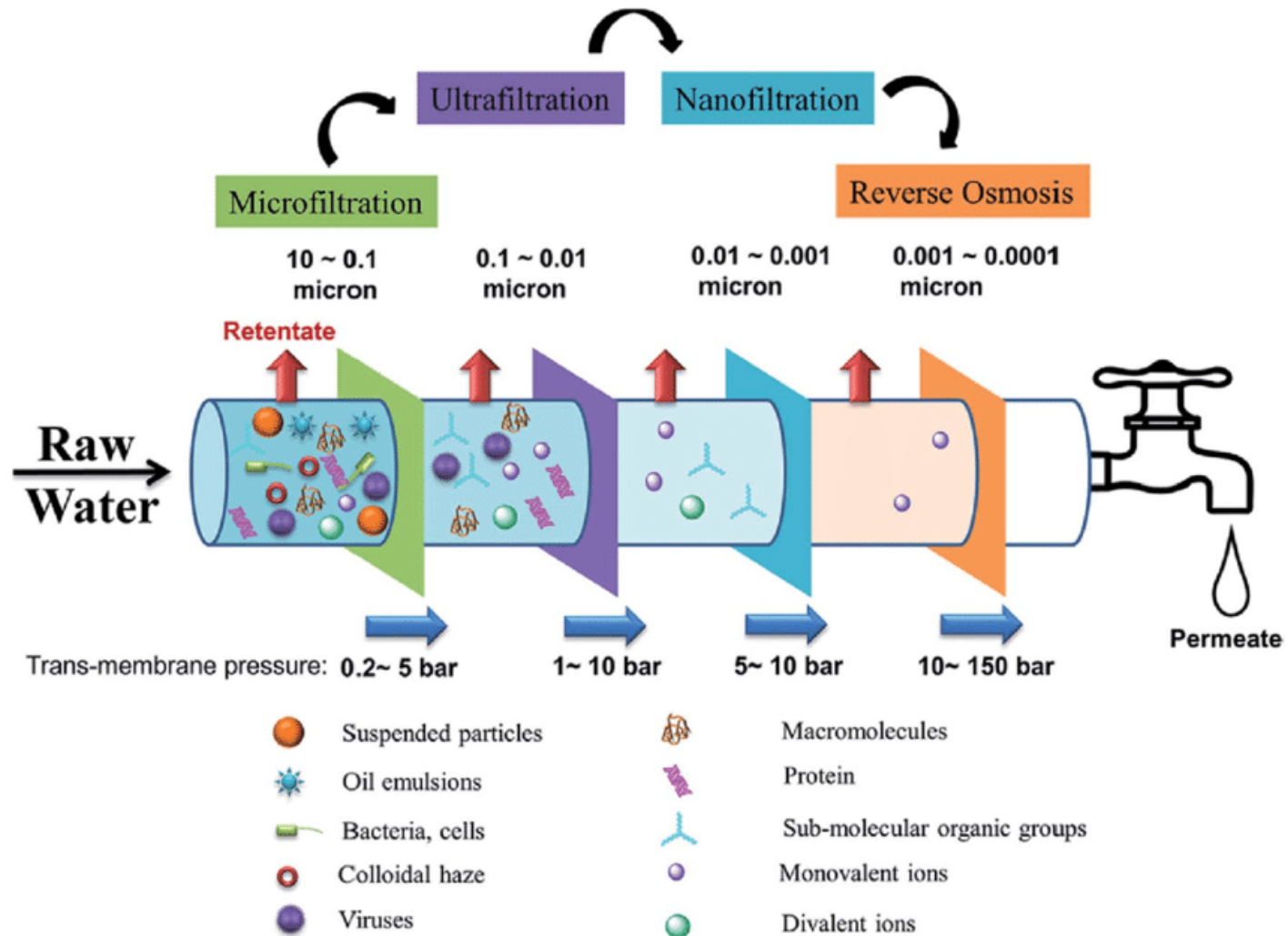




# Drinking Water Treatment



- Drinking Water Treatment Theory (1<sup>st</sup> Step)





- Drinking Water Treatment Process (1<sup>st</sup> Step)

- | 01. Raw Water Intake : Mountain (Eco Zone)

- | 02. Raw Water Tank (Pump)

- | 03. Silica Sand Filter

- | 04. Activated Carbon Filter

- | 05. Sodium Ion Exchanger

- | 06. Microfilter

- | 07. Reverse Osmosis

- | 08. UV

- | 09. Ozone

- | 10. Filtrate Water Tank

- | Chemical & Maintenance Equipment

- | Instrument & PLC Equipment



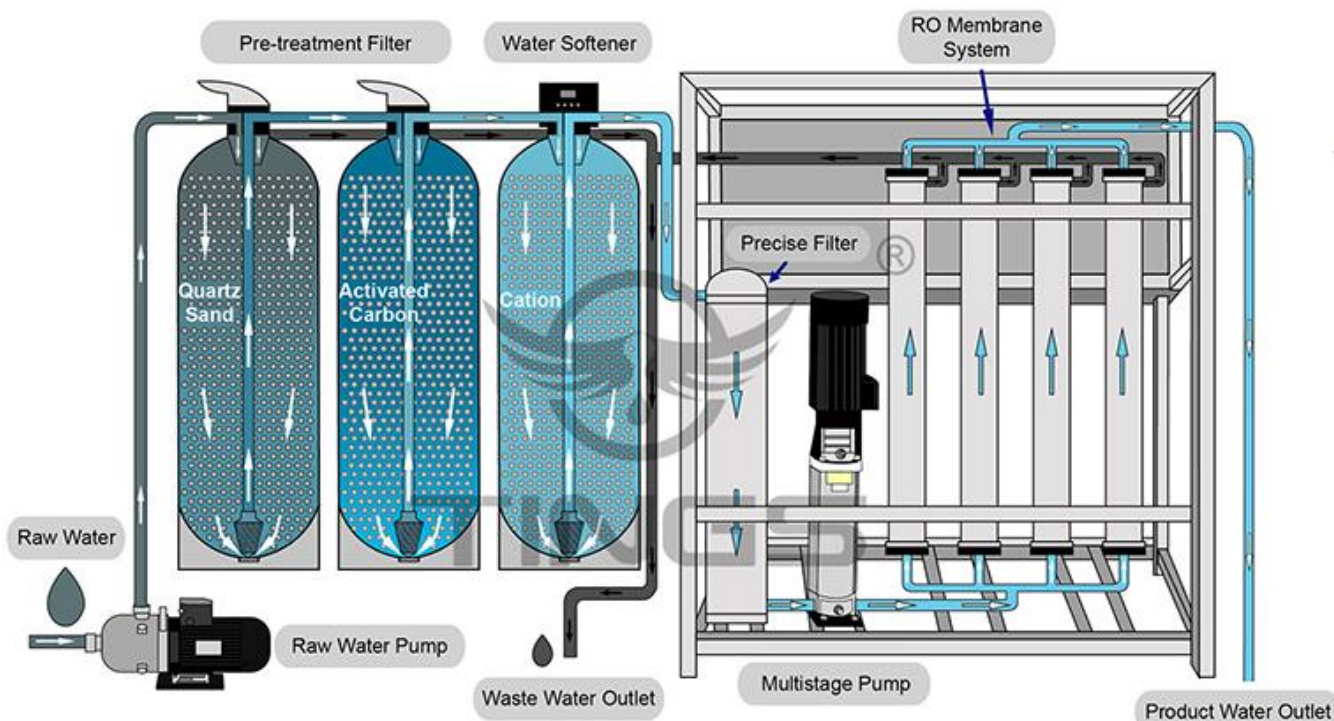
- Drinking Water Treatment Process (1<sup>st</sup> Step)

- | Intake : Well pump, Raw water Tank

- | Pre-treatment : Silica Sand Filter, Activated Carbon Filter, Sodium Ion Exchanger

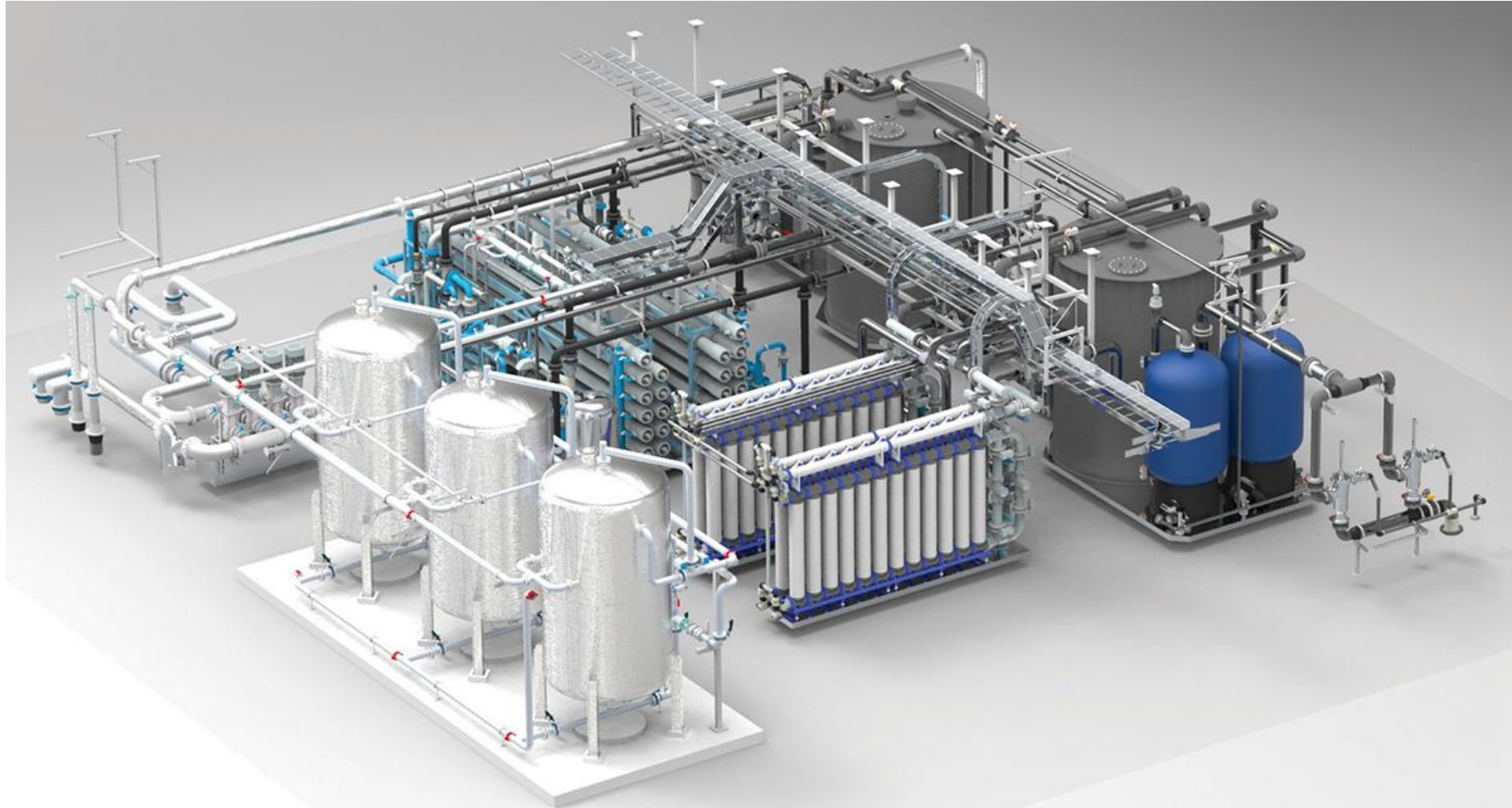
- | Main-treatment : Microfilter, Reverse Osmosis

- | Post-treatment : UV, Ozone, Demineralization, Filtrate Tank



- Drinking Water Treatment Plant (1<sup>st</sup> Step)

| **Membrane Technology base : Ultrafiltration + Reverse Osmosis**





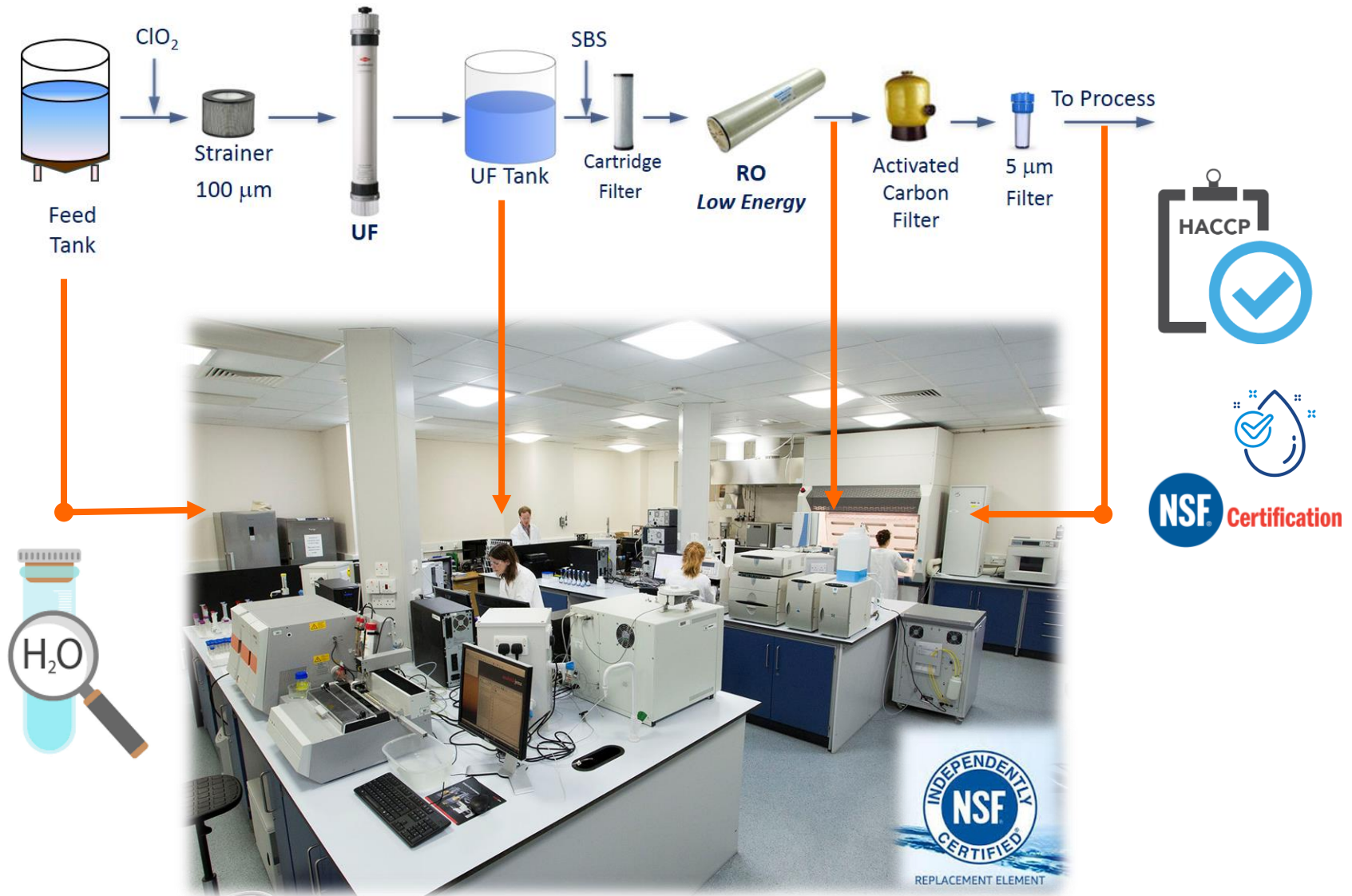
# Eclexport Strategyc



- Eco-friendly Kyrgyzstan Brand
  - | Mountain (Eco Zone)
  - | Water Qualities
  - | Kyrgyzstan Environment
- High Technology Plant for Bottle Export
  - | EU, South KOREA (NO China)
  - | Automation Plant (Clean Plant)
  - | Membrane Technology
  - | Good Infra & Utilities (Truck, Fork Lift, Machine, Store Room)
  - | Water Analysis Lab, NSF, HACCP, Certificate
- Site Survey (22 June 2022) : SAEL vs Kyrgyzstan Standard
  - | **SAEL** : Private, Kara Balta, 150 persons, UK (England) Certificate
  - | **Kyrgyzstan Standard** : Public Official of MOE, Bishkek, 7 persons, Russia Loan (2021)
  - | Output Independence, Site Accessibility, Manpower Expertise, Profitability & Sustainability
  - | Maintenance Efficiency, Future Expandability, Regulation Connectivity & Obligation
  - | **Versatile Analysis Laboratory** : Water, Agro (Soil), Air, Pesticide, Compost, Food, Quarantine



- Water Analysis & Certificate (HACCP, Global Bottling Water Regulation, Kyrgyzstan Drinking Water Standard)



- Bottling Plant Video

<https://www.youtube.com/watch?v=9lxrCKwwGKY>

<https://www.youtube.com/watch?v=irf3gYmRMbU>

- Bottling Process Video

[https://www.youtube.com/watch?v=N\\_u9eBF\\_d80](https://www.youtube.com/watch?v=N_u9eBF_d80)

<https://www.youtube.com/watch?v=7AuHQRQzdbU>

[https://www.youtube.com/watch?v=4y\\_adRAlasw](https://www.youtube.com/watch?v=4y_adRAlasw)

- Premium Bottling Marketing Video

<https://www.youtube.com/watch?v=MbL9ID9Lwlk>

<https://www.youtube.com/watch?v=neZgS5-ckEc>

- Definition of Water Cluster
- Configuration of Water Cluster
- Incentive of Water Cluster
- Expected Effect of Water Cluster
- Future Plan (Road Map) of Water Cluster

# Thank you for your attention







# Production of bottled water in the Kyrgyz Republic

JSC "Kyrgyzindustry"

Bishkek 2022



# Fresh water reserves of Kyrgyzstan

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Lakes - 1745 cubic km;  
Glaciers - 650 cubic km;  
Groundwater - 13 cubic km;  
River drains - 52 cubic km;  
Renewable water resources - 46 cubic km



**The total volume is 2458 cubic km**



Glaciers alone hold 20 years of global  
bottled water consumption



## Source of natural glacial water in the National Park "Ala-Archa"

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- 2100 meters above sea level
- Water from an ecologically clean, protected area

- Crystal clear and pristine taste
- Living and soft water, the chemical composition practically does not change

- Ideal for daily consumption
- No deposition of mineral salts in the body



## Financial potential of the source

The flow rate of the source (water content) is 4320 cubic meters/day or 4.32 million liters/day

Use of 70% of this volume

756 million liters/year



\$225 million/year



Total exports of Kyrgyzstan  
\$226 thousand/year



1000 times



# Bottled water plant

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Compliance with international standard  
ISO/TS 22002-1:2009 Food safety  
prerequisite programs. Part 1. Food  
production"

Plant design according to HACCP principles



# Water treatment

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Filter system for mechanical water purification



Ultraviolet water disinfection system

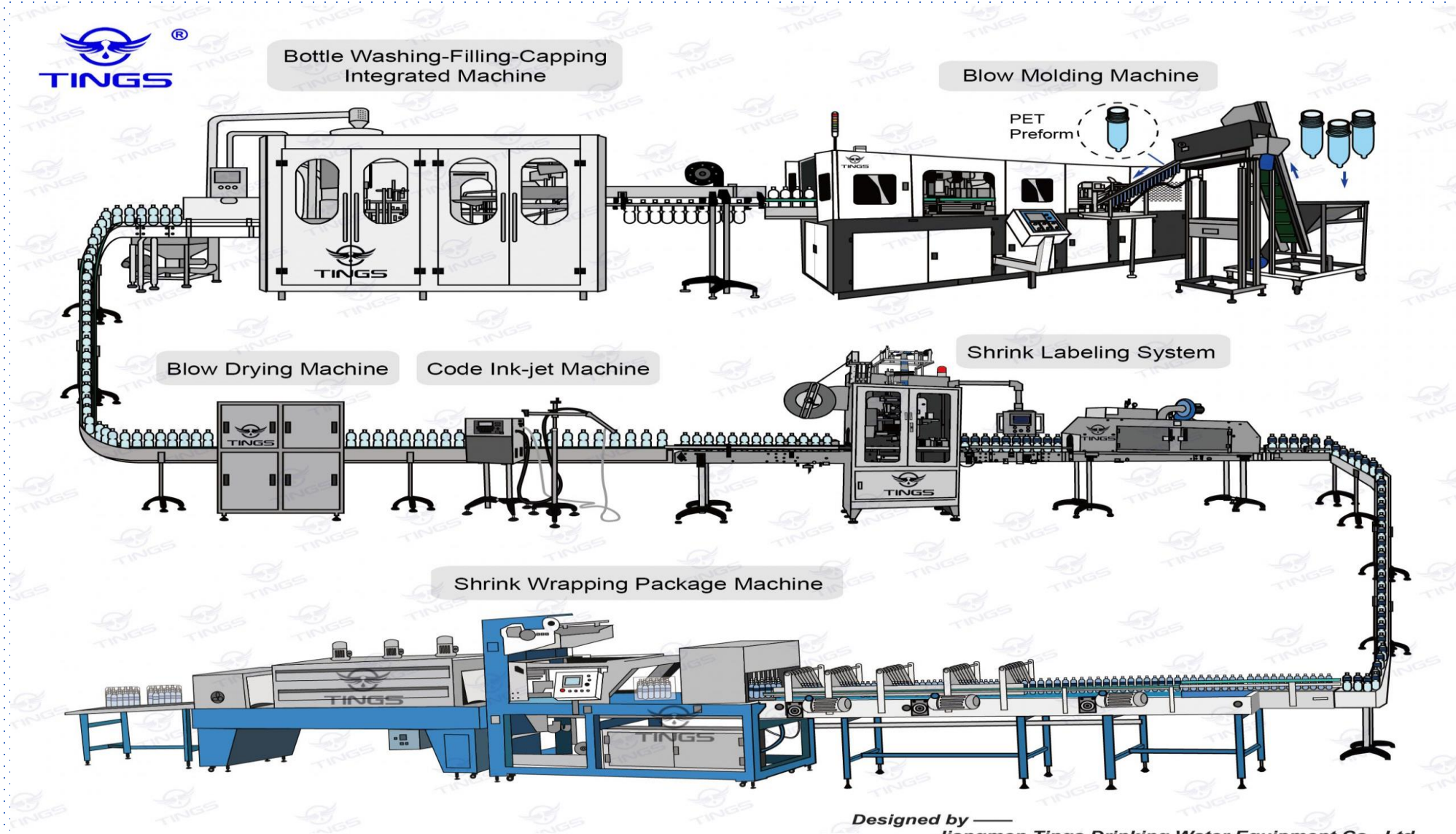


Reverse Osmosis Equipment





# Water bottling



Designed by —  
Jiangmen Tings Drinking Water Equipment Co., Ltd.

# Water bottling equipment

PET bottle making machine



Packing machine



3 in 1 filling machine:  
rinsing, filling, capping



Labeling Machine







**Thank you  
for your attention!**