

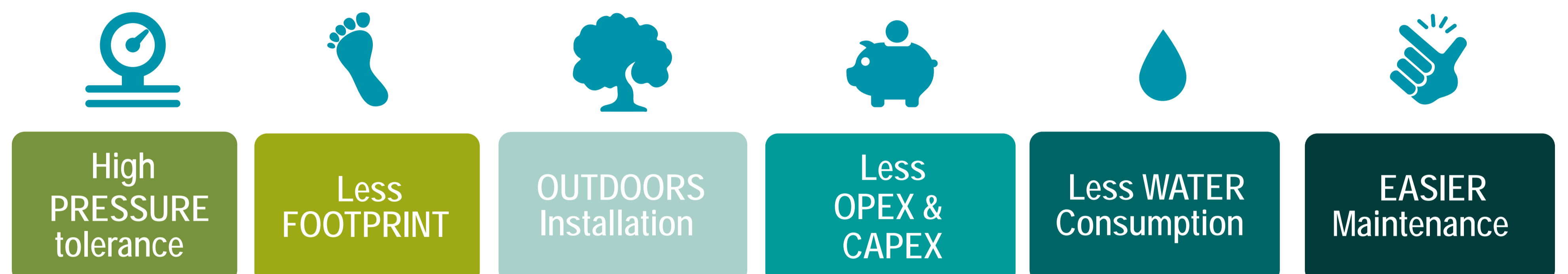


# Integrated UF [i-UF]

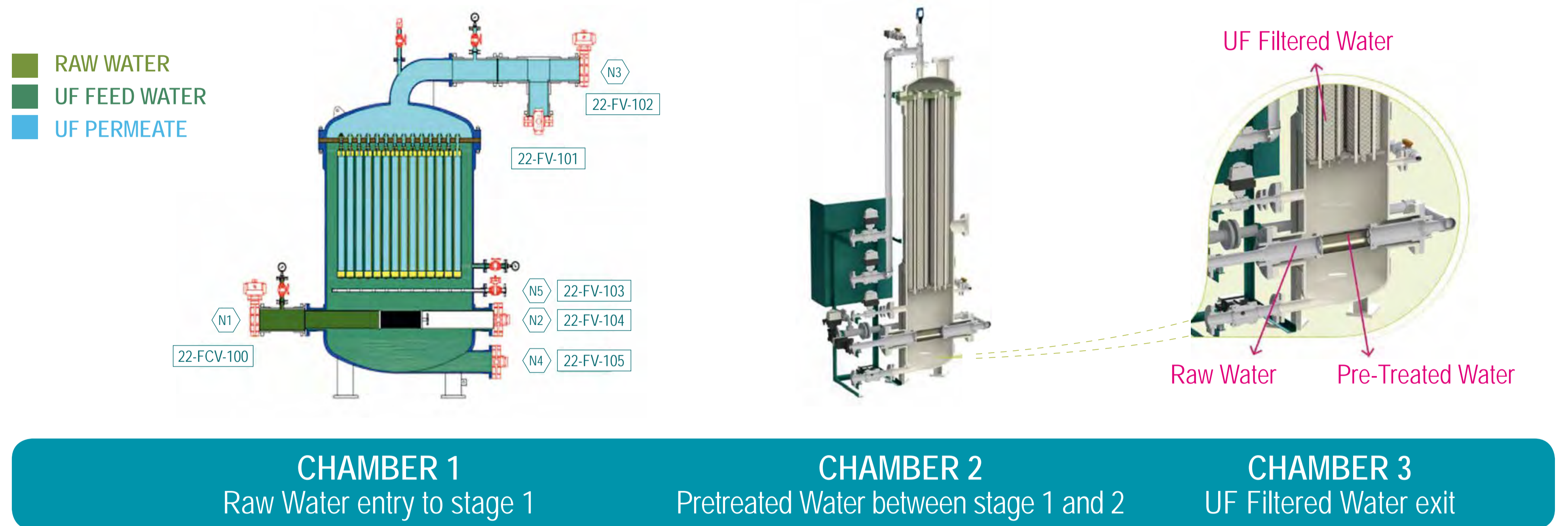
- Next Generation of UF
- **Auto screening & Ultrafiltration** Integrated in the same Vessel



## TARGET ADVANTAGES



## ANATOMY



## PILOTING OBJECTIVES

- VALIDATE DOW™ Ultrafiltration technology for secondary effluent direct treatment
- Demonstrate a **STABLE OPERATION** equivalent to standard UF
- Establish the **OPTIMAL DESIGN PARAMETERS** Operating flux, Duration of filtration cycles, BW & CEB frequency
- **MONITOR THE INPUT AND OUTPUT** quality parameters of the UF

## THE PILOTING

- i-UF 500 for ~10 m<sup>3</sup>/h
- FRP Vessel (ØDN500)
- Metal mesh strainer (150 µm)
- Total filtering area: 165 m<sup>2</sup>**
- Front Valve & Instrument frame
- Backwashing equipment frame
- Chemical Backwash frame
- Power & Control panel with PLC



## SOUTHEAST WASTEWATER TREATMENT PLANT AGÜIMES – ISLAND OF GRAN CANARIA

### Results

Parameter	Unit	Sampling Point	Frequency	Result Average/Max.
TURBIDITY	NTU	Inlet Filtrate	Daily	5.5/13.2 0.2/0.5
SUSPENDED SOLIDS (SS)	mg/L	Inlet Filtrate	Twice per week	6.8/13.0 0/2
CHEMICAL OXIGEN DEMAND (COD)	mg/L	Inlet Filtrate	Twice per week	54.7/72.4 5.7/48.6
BIOLOGIC OXIGEN DEMAND (BOD)	mg/L	Inlet Filtrate	Twice per week	19.3/29.0 1.7/17.0
TEMPERATURE	°C	Inlet	Daily	24°/29°
MICROBIOLOGY (Total Coliforms, E.Coli, Clostridium, Enterococci)	u/100mL	Inlet Filtrate	6 months	Up to 44 <1

### Testing Protocol Summary

Parameter	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Operation Days	21	24	26	33	12	10	13
Flux (LMH)	40	50	55	60	60	65	50
Filtration cycle (minutes)	30	30	30	30	40	30	40
Cleaning Strategy	CEB	CEB	CEB	Mini-CIP	Mini-CIP	Mini-CIP	Mini-CIP
System Recovery (%)	92,0	94,6	93,8	93,2	93,7	92,9	95,7

## PILOT TEST ON-GOING

- **WATER SOURCE:** Seawater Open Intake
- **INITIAL work flow:** 9 m<sup>3</sup>/h
- **FINAL work flow:** 14 m<sup>3</sup>/h
- **INITIAL work Flux:** 55 lmh
- **FINAL work Flux:** 85 lmh
- **FILTRATION Cycle:** 30-90 min
- **TMP** < 0,5 bar
- **SDI In/Out:** Above 5 down to <2.



### Testing Protocol Summary

Parameter	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7
Operation Days	14	14	14	21	21	21	21
Flux (LMH)	55	65	75	75	75	75	85
Filtration cycle (minutes)	30	30	30	40	50	60	60
Cleaning Strategy	CEB with NaOCl every 24 hours CEB with HCl every week						
System Recovery (%)	90	92	94	95	> 95	> 96	> 97

## CONCLUSION

1. TARGET ADVANTAGES VALIDATED
2. OPERATING PERFORMANCE BEYOND CONVENTIONAL UF SYSTEMS