

# Kurita's Innovative Biofouling Control Agent Kuriverter™ IK-110

Water Arabia 2020

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# Agenda



Background



Kurita Innovation – Kuriverter IK-110



Hydrobio – On-line Biofouling Monitoring



References & Case Studies



ackground



# Key Issues Faced with Membrane Installations



Scaling

Antiscalant

Deposition / Fouling

Pre-Treatment and Dispersant

Physical Damage



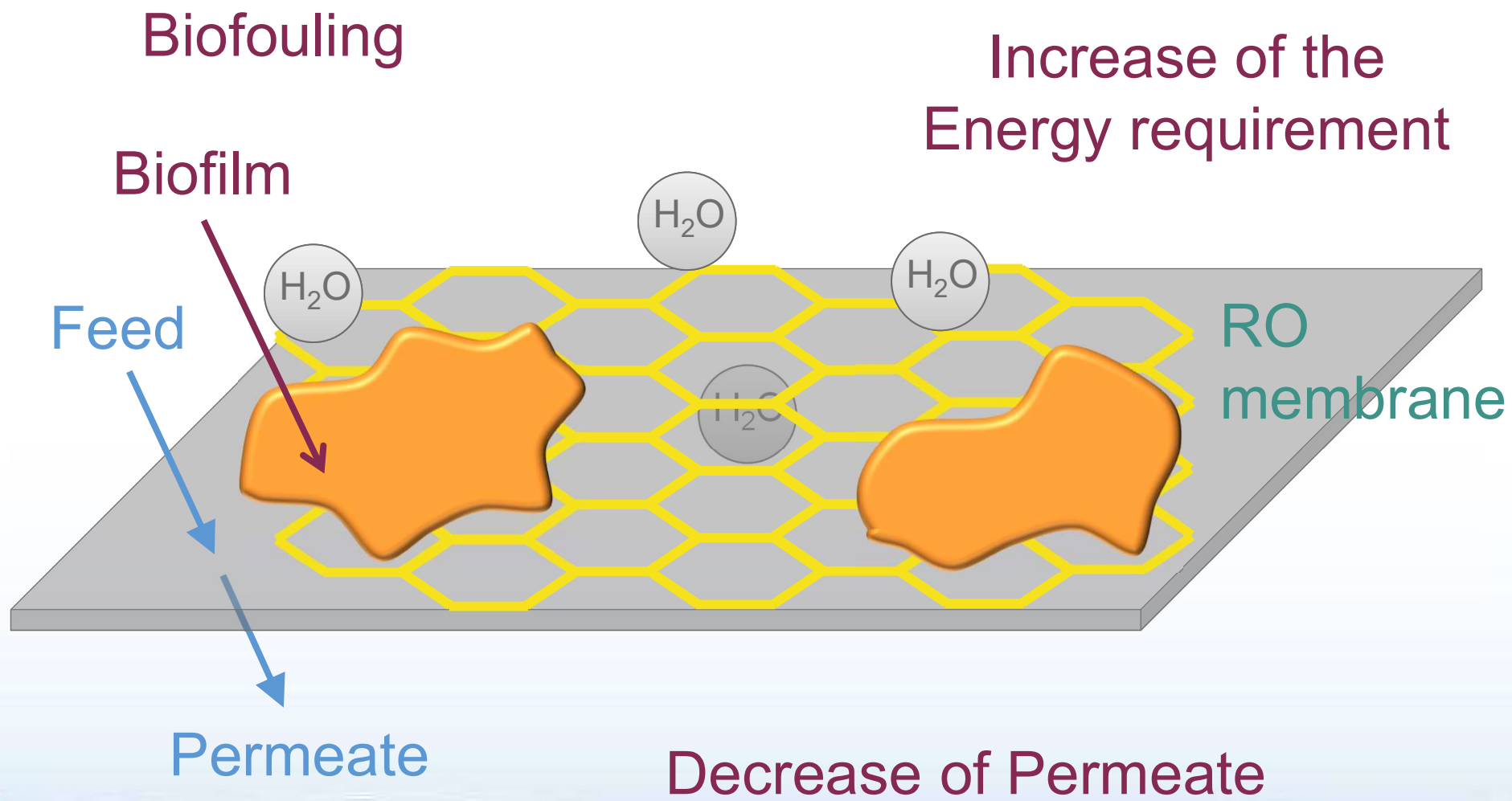
Operational Best Practice

Chemical Damage

On-line Monitoring and Control

Biofouling

Pre-treatment before but in the membrane is more difficult especially when producing drinking water



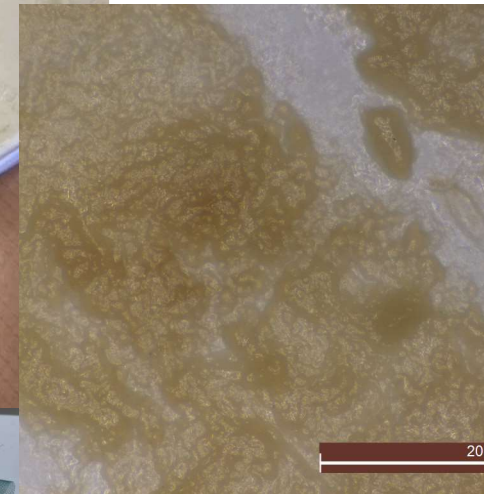
## Key Issue - Biofouling

Fastest significant negative effect on RO performance.

Minor increase in dP = Major increase in pumping energy or lost production

Increased stoppage and lost production for CIP

Long term physical and chemical damage to membranes.





Kuri Innovation  
URIVERTER IK-110

## The key to Biofouling Prevention and Removal



- A highly stabilized combined chlorine compound
- No free chlorine, so it will not damage the membrane.
- All Major membrane manufactures letters of compatibility.
- No oxidizing characteristics; it penetrates the biofilm, creates an unfavorable environment and initiating a detachment of the biofilm from the membrane surface
- NSF Certified for use during drinking water production

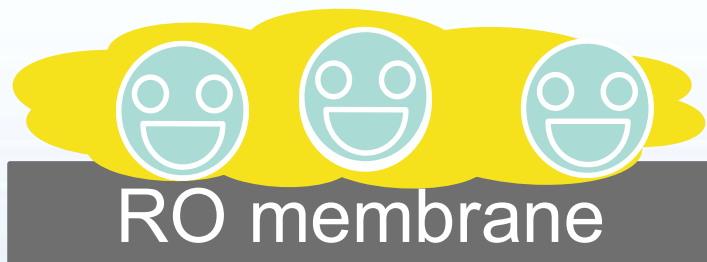




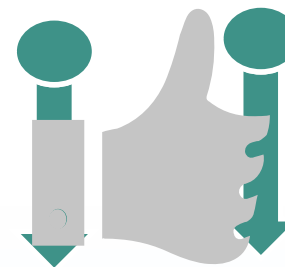
**Biocide**  
Conventional product

**IK-110**  
New biofilm control agent

### Disinfection effect

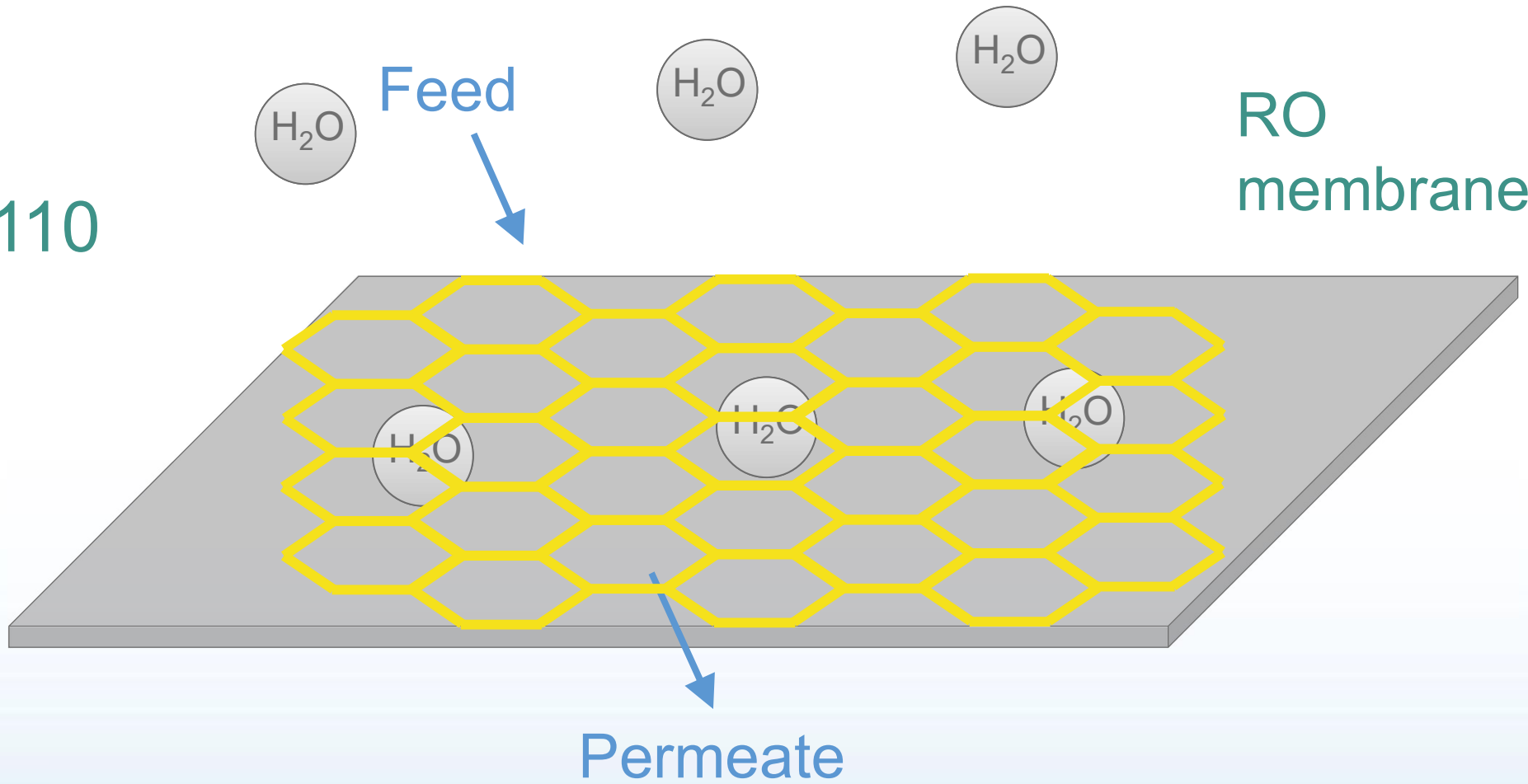


### Peeling off effect

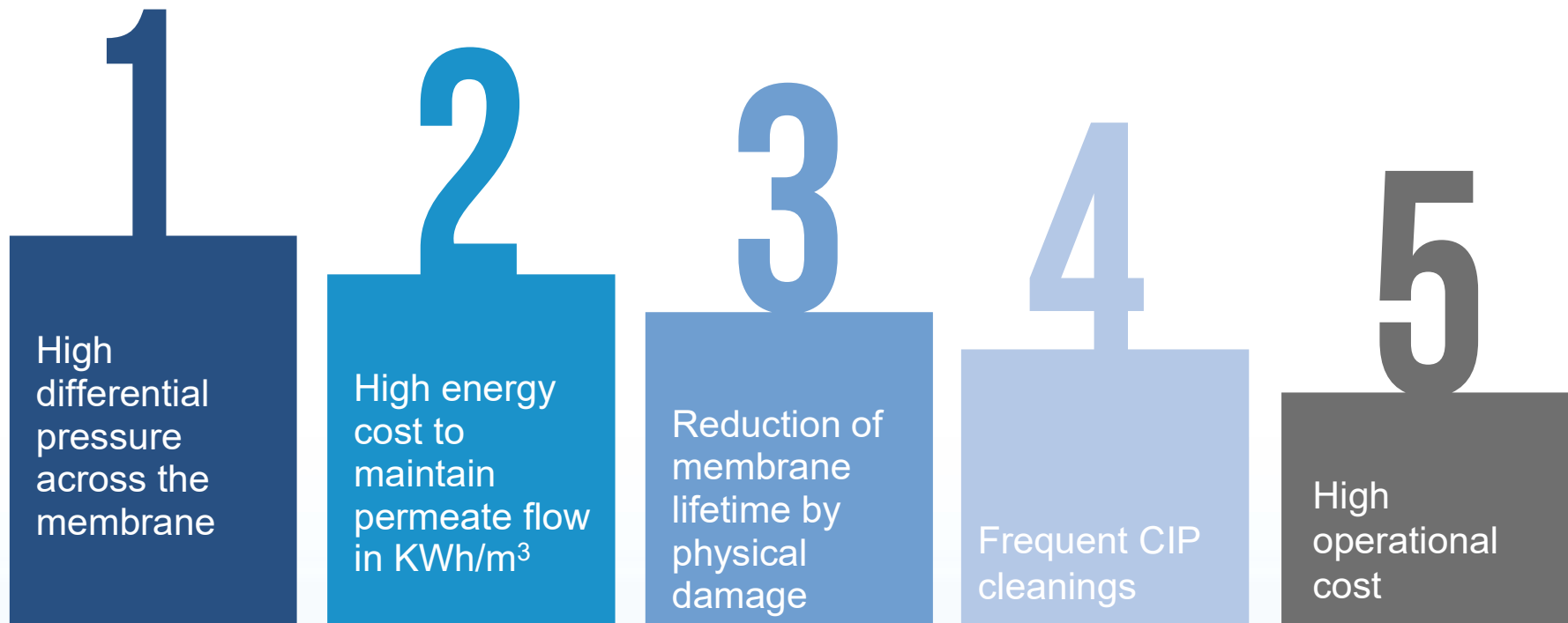


h IK-110

RO  
membrane



ofilm on membranes lead to:



# Kuriverter™ IK-110: Protocol



	Kuriverter™ IK-110 application	Recommended dosage	Running Time
Normal and optimized process	Continuous or Intermittent use as fouling remover	Continuous dosing 10 - 40 mg/L	24h/day
		Intermittent dosing 10 - 80 mg/L	3h – 6h/day

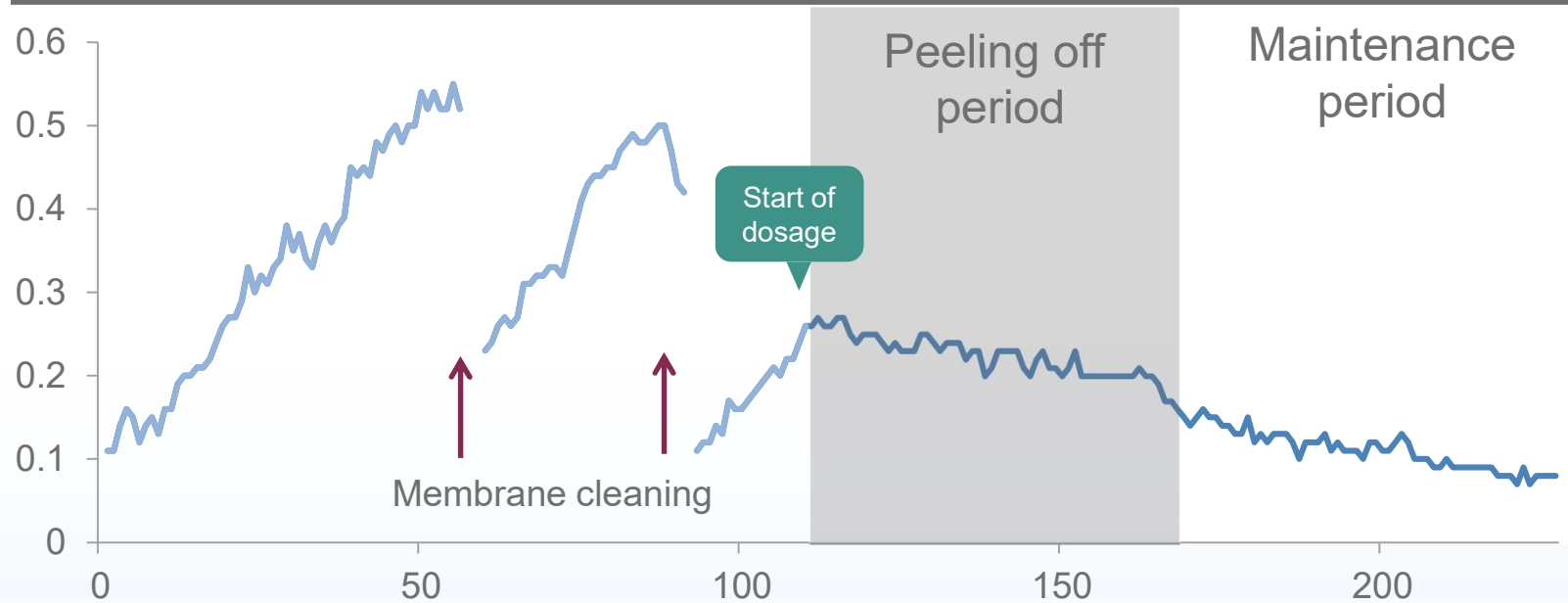
Maximum dosage is 80 ppm according to NSF

In cases of high organic contamination and non drinking water production, dosages can be up to 100 ppm

Dosing is optimized due to operational or seasonal changes

## Peel-off and maintenance effect in an RO membrane

$\Delta P$  in bar over time (days)



Significant reduction of membrane cleaning

## Dosing

Continuous or intermittent according organic load

Dosing before filters keeps them clean and reduce replacements

Can be dosed ahead of UF and MMF

## Control

Monitor with a simple HACH Total Chlorine test method

Plot normalized parameters of Delta P, Salt Rejection and Flux

Hydrobio® Advance

# inverter™ IK-110: Summary of benefits



Reduces differential pressure across the membrane

Reduces pumping energy requirement

Restores and maintains permeate flow

Reduces CIP cleaning frequency

Reduces membrane damage and replacement

Product NSF listed and patented

Easy to measure and control by HBA



HydroBio Advanced  
for RO systems



# BA - Hydrobio<sup>®</sup> Advance



Real time monitoring and optimization tool

**1** Continuous monitoring of biofouling

**2** IK110 Dosage optimization

**3** Tracking of treatment efficiency

**4** Maintain lowest possible dP and energy cost



A close-up, shallow depth-of-field photograph of a binder with blue tabs. The tabs are arranged in a row, and the text "References & Case Studies" is overlaid on a semi-transparent white rectangular box in the center. The tabs in the foreground are labeled "Bi" and "Ch", while others in the background are partially visible and out of focus.

# References & Case Studies

# References for Kuriverter™ IK-110



More than 200 global references available

## Across All Industries



Desalination  
Power Plants  
Electronics  
Effluent Recovery

Steel and Metal  
Food and Beverage  
Automotive  
Tire and Rubber

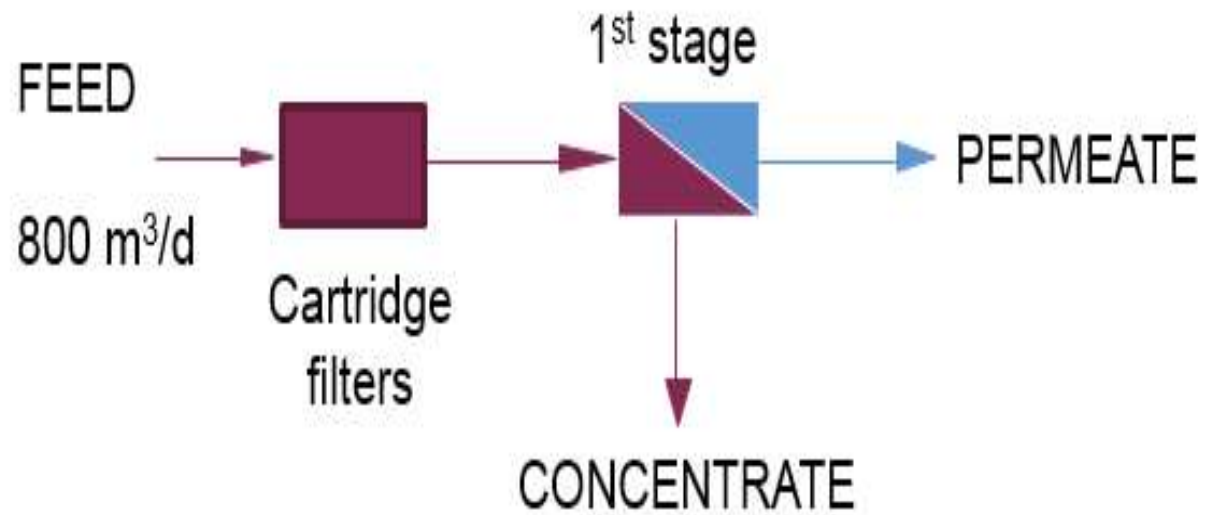


Membrane Manufacturer Letters of Compatibility  
Customer Reference Letters supporting savings



# Case study I

## Background



VRO plant with 800m<sup>3</sup>/h capacity affected with biofouling searched for an electricity and operation cost reduction solution.

# Case study I

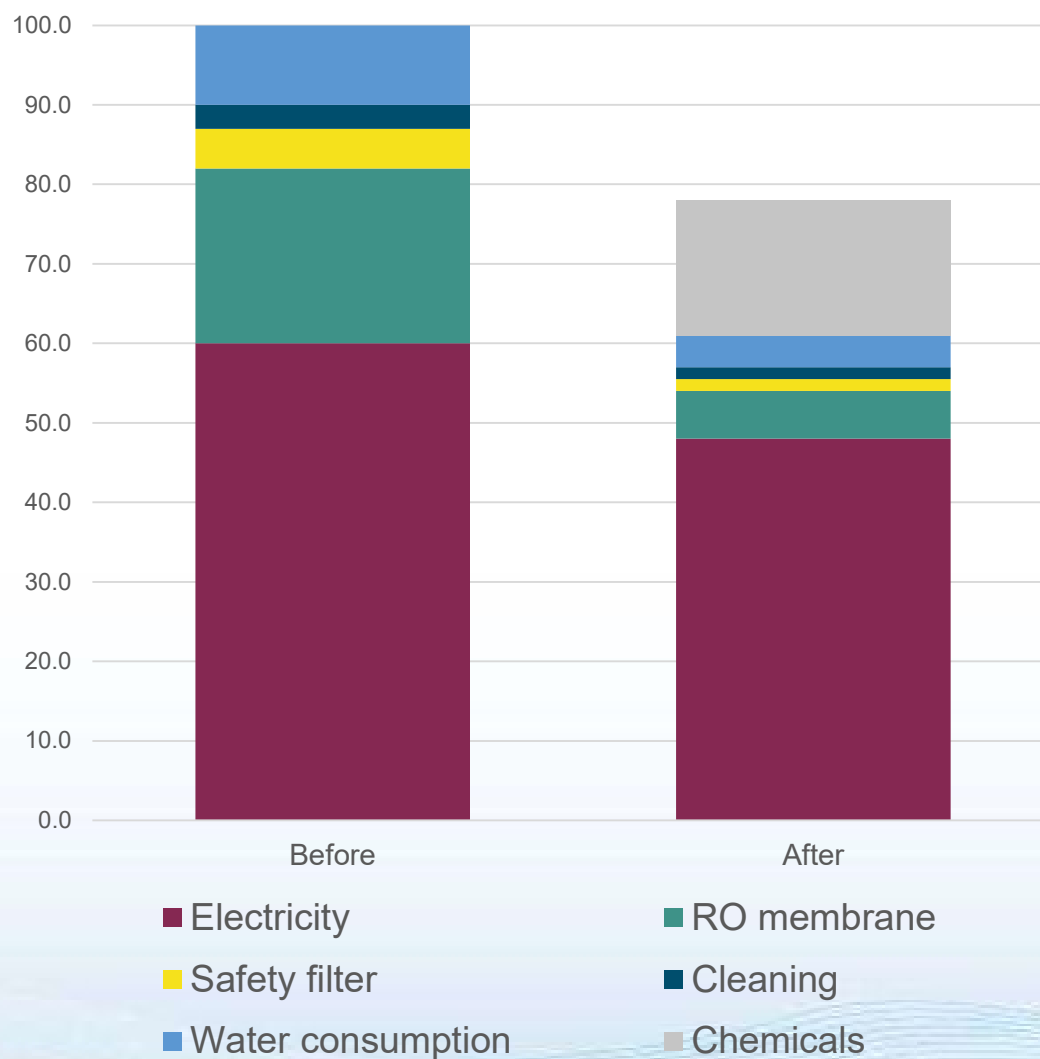
## Treatment and results

Kuriverter IK 110

Dosage: 40mg/L

Frequency: 4h/d

Cost comparison



Case study I

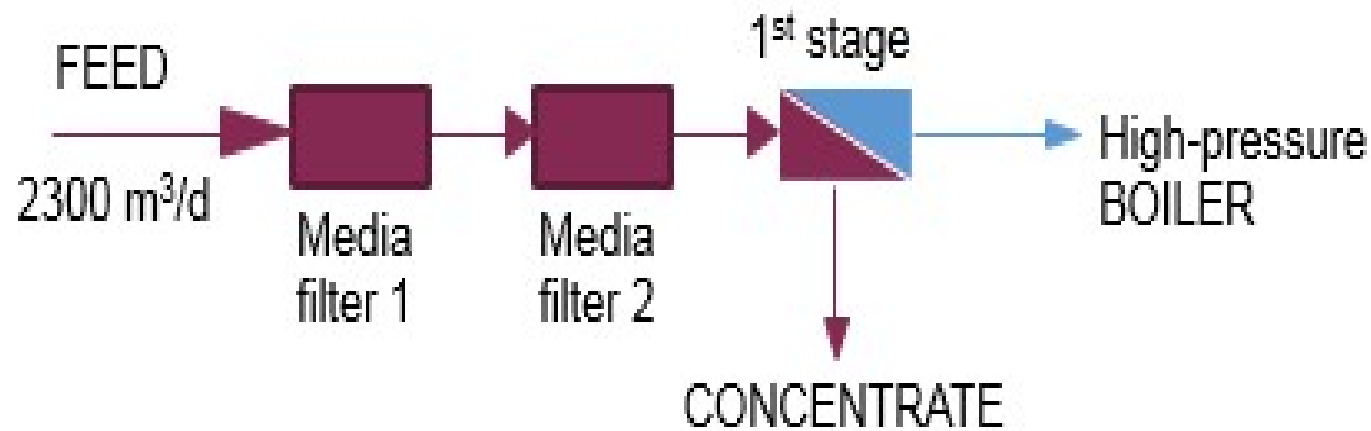
Conclusion and achievements

Extraordinary biofouling reduction



# Case study II

## Background



The Kurita customer has a RO plant for the industrial water preparation. The feed water used in the RO plant is SWRO and the permeate is used as make up water for the boiler system.

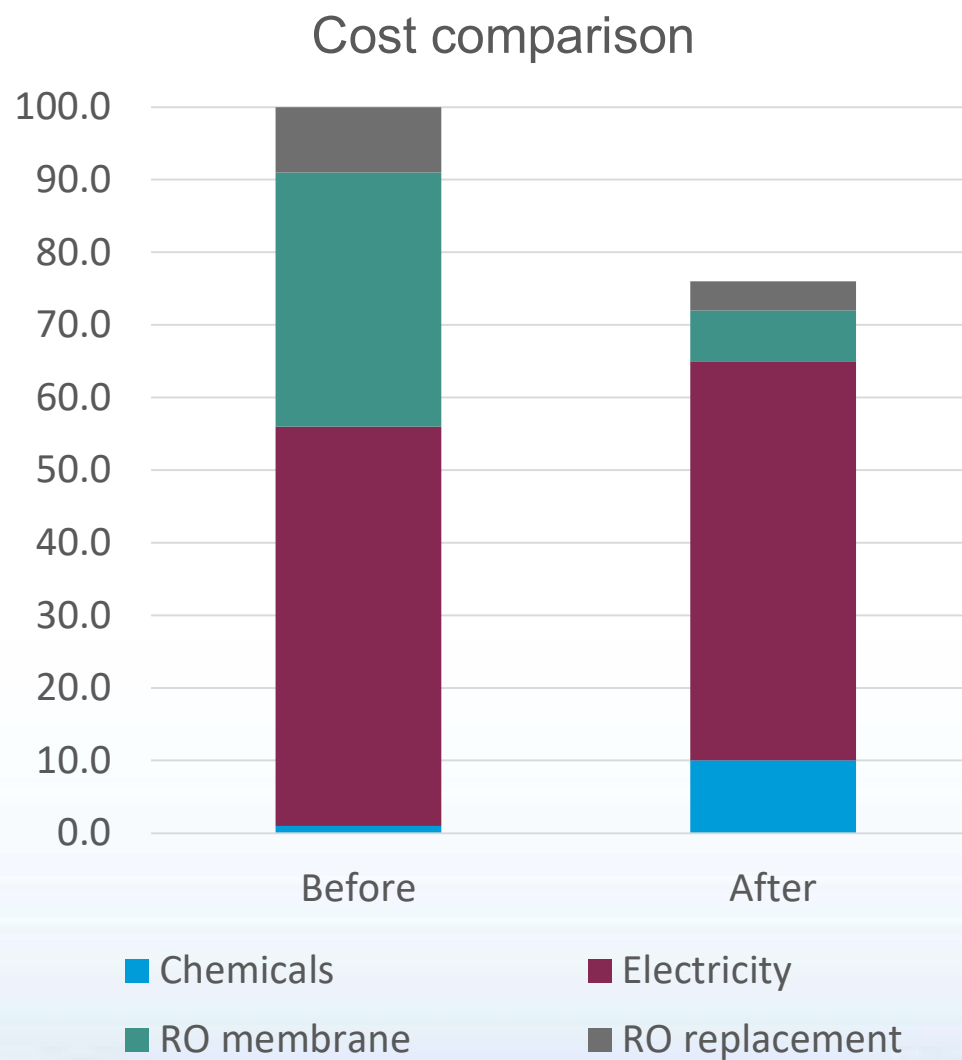
Due to biofouling problems, Kuriverter™ IK-110 was proposed to the customer.

# Case study II

## Treatment and results

Kuriverter™ IK-110

Dosage: 5mg/L





## Case study II

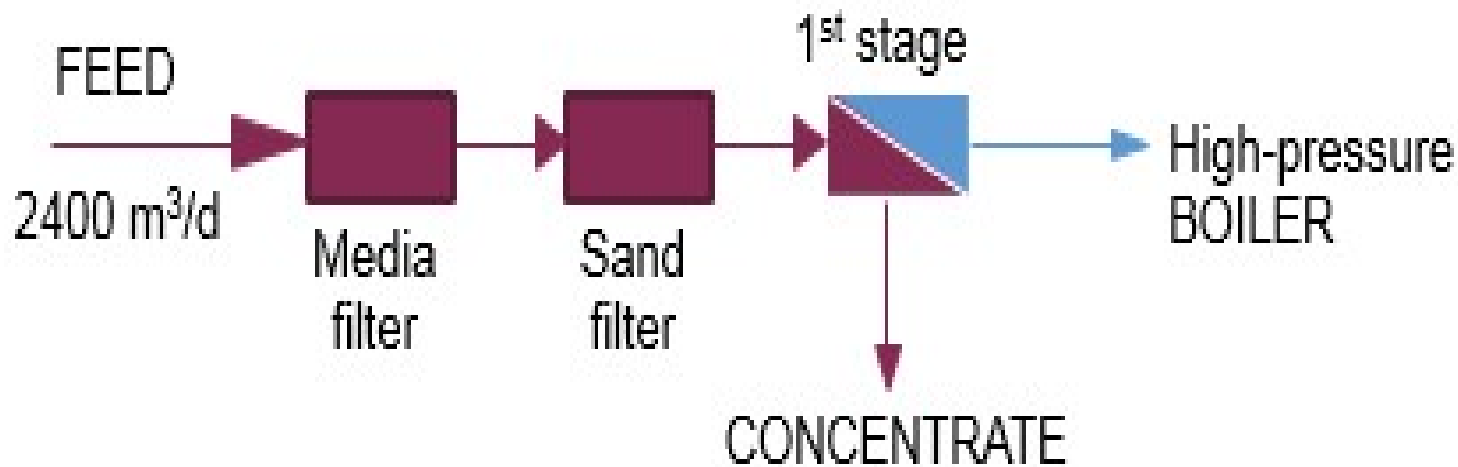
### Conclusion and achievements

Remarkable total cost reduction thanks to Kuriverter IK110



# Case study III

## Background



A Chinese industry with a RO plant for the industrial water preparation faced a biofouling problem which involved a large number of annual cleanings. The feed water used in the RO plant is SWRO and the permeate is used as make up water for the boiler system.

# Case study III

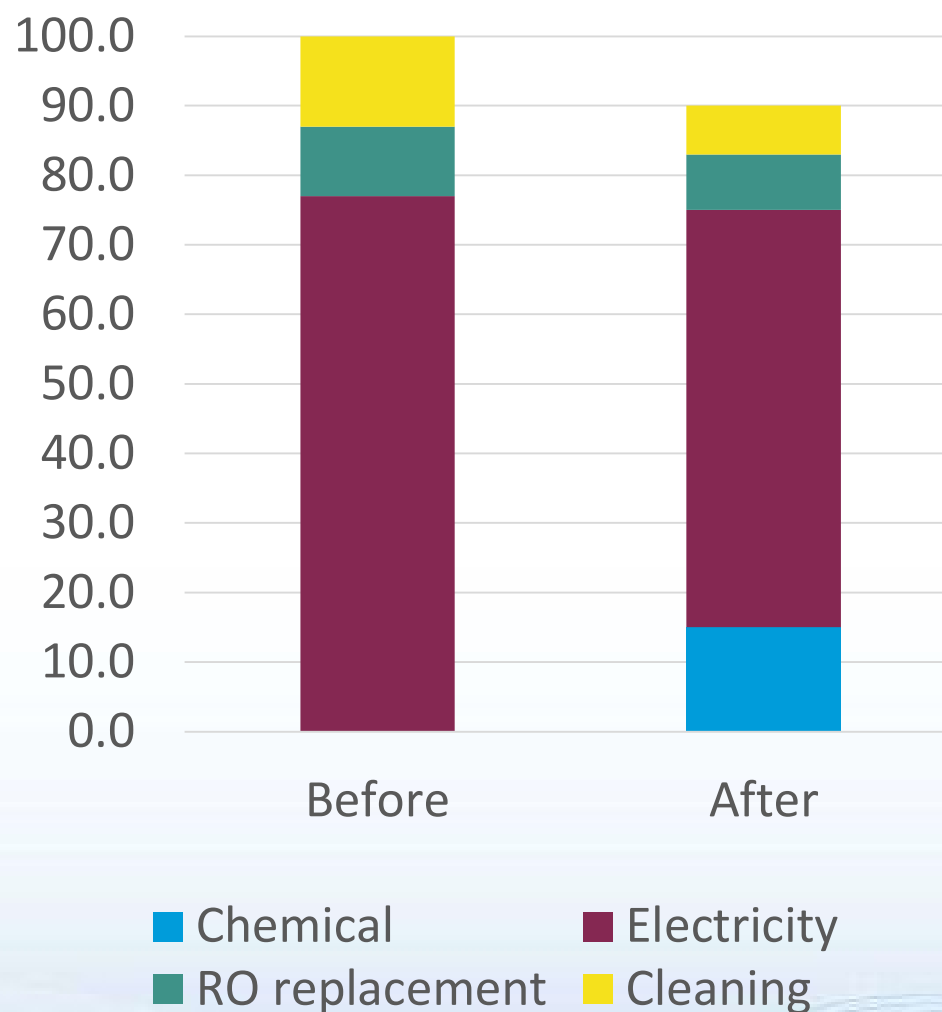
## Treatment and results

Kuriverter™ IK-110

Dosage: 40 mg/L

Frequency: 3h/d

### Cost comparison



Case study III

Conclusion and achievements

Less annual cleanings and RO replacement



QUESTIONS



ANSWER

contact us

# Contact information



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