

Measuring the impact of carbon avoiding solutions on the water sector: A Case Study

Advanced membrane technology from DuPont provides low-carbon upgrade for the water sector

→ **156%**

of the membrane product carbon footprint is off-set by the avoided emissions



DuPont has developed low-energy membrane technology to **reduce energy consumption** of reverse osmosis systems by 3%

Capturing avoided emissions

— assessment details

- **Functional Unit:** MT CO₂e / mid-sized reverse osmosis treating facility of 750 m³/h capacity
- **Impact:** 180 MT CO₂e
- **Time Period:** 5 years, which is the useful life of the product
- **Scope:** Global
- **System Boundaries:** Reverse osmosis membranes production - Brackish water treatment using the membranes to convert 3/4 of the water to high quality freshwater - membranes end of life

The Business-As-Usual Scenario

- A mid-sized brackish water plant using industry standard FilmTec™ BW30-400 reverse osmosis (RO) membranes elements to produce freshwater
- With more than a 30 year history, FilmTec™ BW30-400 RO elements have become a trusted standard for producing quality water for energy, industry and drinking purposes
- An example mid-size RO treatment system uses 1050 RO elements which are replaced every 5 years approx.

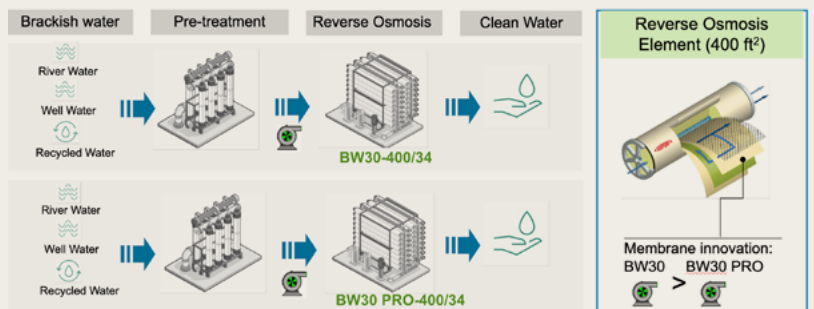
The Low-Carbon Scenario

- Introduced in the market in 2022, FilmTec™ BW30 PRO-400 RO elements produce the same freshwater at lower operating pressures
- Operating at lower pressure generates clean freshwater for energy, industry and drinking uses with less energy, CO₂ emissions and cost
- CO₂ emission savings can be calculated using the DuPont Water Solutions Sustainability Navigator tool
- The product carbon footprint, number of elements needed and expected element lifetimes remain unchanged



How It Works

FilmTec™ BW30 PRO membranes reduce the required water pressure and saves energy



From the perspective of the Water treatment plant owner: Reduce Scope 2 emissions due to lower electrical load to operate pumps; Scope 3 emission are unchanged.

WBCSD Avoided Emissions Eligibility Gates

- Gate 1 (Climate Action Credibility)
- Gate 2 (Climate Science Alignment)
- Gate 3 (Contribution Legitimacy)

Environmental and Social Side Effects

75% of a salty water source is transformed into high quality freshwater to secure water access for industrial, energy or municipal users.
The upgrade membrane performance allows this water access with less energy demand.
Reverse osmosis membrane lifetimes average 5 years after which they are disposed (landfill or incinerated based on local access).

Third-Party Verification

Within the framework of the DuPont Sustainability Navigator tool, in 2023 LRQA has verified the CO₂ emissions to be in conformance with ISO 14020:2001 and ISO 14021:2016.



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