

WATER TREATMENT · OPERATING STRATEGY

Operator Models for Water Treatment

Purchase, rent, lease or outsource operation —
decide on performance, responsibility and
life cycle together.



A DECISION FRAMEWORK FOR OPERATORS, ENGINEERING, PROCUREMENT AND FINANCE

Ownership does not determine performance

THE DECISION SEQUENCE

- 01 Purchase
- 02 Rental
- 03 Leasing
- 04 Outsourced operation

A water-treatment system is at once a technical plant, an operating service and a long-term obligation. Purchase, rental, leasing and an outsourced operator model distribute capital, tasks and risk in different ways. None removes the need for a clear performance definition.

The decision begins with the water quality, availability and response capability the site needs. Only then can it determine who invests, operates, maintains, records and answers for deviations. A comparison based on entry price alone is too narrow. Include energy, water, chemicals, maintenance, spares, labour, downtime and end-of-life costs. Article 68 of EU Directive 2014/24/EU applies this life-cycle logic to public procurement.

Define performance and limit values first, assign responsibility down to the measurement point, compare total costs over the period of use, and plan changes and exit before signing. Choose the model that connects required performance to an interface and risk structure that can be managed.

Ownership, operation and duties are different levels

An owner may outsource operation; an operator may rent equipment; and legal site duties may remain with the company despite a service provider. The contract must connect these levels clearly. Distinguish ownership and capital, operation and performance, and duties and evidence. Hold them together through a common definition of quality, quantity, availability, response and records.

At the technical interface, say where feed water, treated water, residuals, energy and data are handed over. At the operational interface, assign scheduling, monitoring, maintenance, alarms, records and release decisions. At the commercial interface, define how volume, price, availability and change risks are paid for or limited. Responsibility becomes real at physical handovers: pipes, sensors, pumps, storage and operating data.

Purchase gives control, not automatic stability

With a purchase, the company takes ownership and makes the investment decision. It gains design freedom but needs technical competence for planning, commissioning, operation, maintenance and later adaptation. Purchase is plausible when demand is stable over the long term, the process is strategically important and internal teams can actively run the plant.

The economic case includes media, spares, scheduled and unscheduled maintenance, personnel and downtime alongside the purchase price. The main danger is a narrow procurement scope. If only equipment is bought, data access, optimisation logic, response times and modernisation may remain poorly defined. Procure the conditions for reliable performance as well as the plant.

Ask whether the site can maintain performance if feed water, costs or requirements change. A

long-term investment needs enough flexibility for changing resource and site conditions.

Flexibility requires contractual room for change

Rental and leasing reduce initial capital commitment but differ in duration, included services and technical risk. Rental may suit a period of uncertain design, a temporary requirement or urgent support for existing supply. Assess mobilisation, utilities, measurement and removal.

Leasing spreads payments across a longer period while the company uses the plant without immediate full purchase. Maintenance, availability and process responsibility do not transfer automatically. Treat finance and operating performance as separate service areas, even if they sit in one contract.

Volume, feed water and discharge requirements may change. Define how expansion, alteration or replacement will be assessed and approved. Return, purchase option, residual value, dismantling, site restoration and handover of operating data belong in the initial decision. A short cancellation notice provides little real flexibility if permits, connections or replacement supply make switching impractical.

An operator model needs a closed control loop

In an outsourced operator model, the client purchases defined performance and the provider assumes agreed operating tasks. Measurement, assessment, action and evidence must form a continuous loop: define water quantity, quality and availability; validate the data; identify deviations; adjust operation; and demonstrate performance.

Three safeguards matter. Transparency makes readings, interventions and causes understandable to both parties. Resilience defines exclusions, response times and substitute measures for

availability. Interfaces allocate feed water, utilities, access and authority communication explicitly. The service emerges from the plant, measurement, maintenance and documented response working together.

KPIs must trigger decisions

A KPI is useful only when measurement point, method, data availability, tolerance and response are defined. This is true regardless of ownership. Quality specifies parameters at the transfer point. Quantity specifies flows and variability. Availability states which hours count and which events are excluded. Yield balances feed, product and residual streams. Resource measures normalise energy, chemicals and water. Response says who acts, and when, after an alarm, trend or limit breach.

The data chain is sensor or laboratory value, validated dataset, agreed assessment and documented action. Each transition needs an owner. One efficiency KPI can create the wrong incentive, so consider quality, resource use and plant condition together. ISO 46001 treats water-efficiency management as continuing monitoring, measurement, documentation, reporting, design and procurement; these metrics therefore guide joint operation, not only invoicing.

Put each risk with the party that can influence it

Risk transfer without the ability to control the cause tends to produce high contingency charges, exclusions or disputes. Separate the cause, influence and financial consequence. Describe feed-water variation, membrane or equipment wear, utilities and process limits with bands and escalation rules.

Minimum volumes, peaks, price indexing, energy and disposal costs need clear adjustment mechanisms. New regulation may require modifications, added monitoring or changed operation; the contract must allocate responsibility

and provide a change process. Redundancy, substitute supply, spare stock and response time determine whether an outage remains a technical fault or becomes a production risk.

Plan the last day as carefully as the first

Contracts are often detailed at startup and vague at termination. Dependencies then become visible: missing data, undocumented spares, ended software access or unclear removal duties. Define data formats, document status, spare inventory, open defects, dismantling, disposal and site restoration. A change of operator also requires instruction, transition operation and knowledge transfer.

Plan for future volume, feed quality and discharge requirements. State how capacity is expanded and who triggers the investment. Then the contract term becomes a manageable life cycle: startup and takeover; operation and adaptation; data and knowledge transfer; and orderly exit.

The value of a model lies in controlled development from startup to transition. At takeover, assess plant condition, records, software, spares and warranty. At transition, plan parallel operation, training, data migration and transfer of duties. At exit, agree dismantling, disposal, utilities and restoration.

Compare models on one technical basis

Use the same volumes, quality requirements, term and boundary conditions for every option. Otherwise the comparison confuses financing form with different technical performance.

Test a base, stress and change scenario. For water volume, consider normal demand, seasonal peak and growth or decline. For feed water, consider the normal range, critical input and a new source or blend. For service, consider agreed quality, fault and alternative operation, and a new outlet

requirement. For resources, consider reference use, price and supply stress, and an efficiency goal. For term and organisation, test planned use, early termination, extension, staffing shortages and operator change.

Life-cycle cost under Article 68 of Directive 2014/24/EU includes purchase, use such as energy and other resources, maintenance and end-of-life costs. That logic is useful for internal comparisons beyond public procurement: assign a cost to the event that causes it. Quantitative criteria include present value, annual cost, price per volume, energy, chemicals, maintenance, residual value and modifications. Qualitative criteria include control, response, data access, competence, dependence, adaptability and permit risk.

Define performance before selecting a form of ownership

First specify the complete system boundary: feed water, product water, residuals, utilities, sensors and site services. Then write measurable requirements for quality, quantity, availability, resources, response and records. Assess internal skills, staff, investment capacity, maintenance and permit knowledge realistically.

Assign major risks to the party best able to affect their cause and consequence. Compare purchase, rental, leasing and outsourced operation over the life cycle on the same technical basis. Settle data, plant condition, change, end of term and operator transition before signing. The financing form is the outcome of a technical and organisational decision, not its starting point.

Questions for the next decision

Is the complete technical boundary described?
Which performance values can be measured and enforced? Who owns operation, maintenance, data and authority contact? Which risks can each party actually influence? Have base, stress and change scenarios been calculated? How are prices, volumes and external costs adjusted? What happens after a fault, an expansion or contract termination?

The financially appropriate model is not necessarily the one with the lowest entry price. It is the one whose performance, responsibilities and ability to adapt remain transparent throughout its life cycle.

References

ISO 46001:2019, Water efficiency management systems — Requirements with guidance for use, published 2019; check current revision status with ISO.

Directive 2014/24/EU, Article 68, life-cycle costing; EUR-Lex consolidated text.

German Environment Agency (UBA), Water reuse, updated 7 July 2023; and indicator IG-R-3 on water abstraction by manufacturing industry, for the context of water efficiency and climate resilience.

Editorial status: August 2026. This report is a structured decision aid. It does not replace site-specific technical, legal, tax or accounting advice. Requirements, measurement concept and contractual structure must be checked for the particular project.

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