

EXECUTIVE SUMMARY

Booklet for presentation and dissemination

Legal framework, management models and conditions for implementing reclaimed water reuse

Comparative analysis · viability · risks · replicability · success cases · recommendations

SPAIN · PORTUGAL · FRANCE

with international references from Australia and Israel

Summary document for attendees

September 2026

EXECUTIVE SUMMARY CONTENTS

01 International comparison	02 Viability and risks	03 Replicability and cases	04 SWOT and roadmap
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Publication-ready booklet · Executive summary

EXECUTIVE SUMMARY AT A GLANCE

What the study concludes

Water reuse is a strategic tool, but its success depends as much on governance and demand as on technology.

CORE IDEA	The main challenge is no longer to prove that reclaimed water can be used safely, but to create the administrative, economic, institutional and social conditions needed to implement effective and sustainable projects.		
5 systems compared	8 reuse models	16 cases and references	12 replicability conditions

SIX EXECUTIVE MESSAGES

01 DEMAND STRUCTURES THE PROJECT; THE RESOURCE IS VALIDATED The scheme should be structured around real, organised demand. Resource availability, quality and seasonality should be checked at an early stage and confirmed immediately afterwards.	02 DEMAND BEFORE INFRASTRUCTURE Viability improves when users, volumes, seasonality and ability to pay are demonstrated from the outset.
03 RISK IS MANAGED IN OPERATION Barriers, controls, responsible parties, contingencies and traceability must be part of the system's day-to-day operation.	04 GOVERNANCE IS DECISIVE Multi-user and environmental models require stronger coordination structures than single-user schemes.
05 TRANSFER IS SELECTIVE Portugal, France, Australia and Israel provide useful tools, but there is no external model that should be copied in full.	06 REPLICATION MEANS REPRODUCING CONDITIONS A success case is transferable when its conditions of resource, demand, financing, operation and acceptance can be reproduced.
USEFULNESS	The document helps identify which models are easier to implement, where risks are concentrated, which conditions must be checked before replicating a case and which actions should be prioritised.

KEY TAKEAWAYS

01 Structure demand before developing the project	02 Confirm resource and financing	03 Turn risk into operational management
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FROM EFFLUENT TO A VIABLE PROJECT

Seven pieces that must fit together

The order reflects the logic used to structure the project. Resource availability should be subject to preliminary screening from the outset and confirmed once demand has been characterised..

1	AVAILABLE RESOURCE Sufficient, stable and characterised effluent
2	IDENTIFIED DEMAND Users, uses, volumes and time patterns defined.
3	TERRITORIAL AND HYDROLOGICAL FIT Compatibility with planning, environmental objectives and existing rights.
4	ENABLING PERMITS Production and supply authorisation, concession or amendment, and sectoral reports.
5	INFRASTRUCTURE Reclamation, storage, transport, distribution, metering and delivery.
6	RISK MANAGEMENT Barriers, controls, responsibilities, contingencies and traceability.
7	SUSTAINABLE OPERATION Contracts, tariffs, financing, maintenance, communication and continuous review.

MAIN BOTTLENECKS

COORDINATION Fragmented responsibilities.	PROCEDURES Linked permits and reports.	INFRASTRUCTURE Distances, networks and storage.	ECONOMICS Costs and demand risk.	TRUST Acceptance and transparency.
READING		Health, environmental and water controls are necessary safeguards. They become barriers when applied in a fragmented, unpredictable or disproportionate way.		

DECISION SEQUENCE

01 Structure demand	02 Validated resource and viable infrastructure	03 Proportionate governance and verifiable benefits
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Analytical basis: Chapters 2 to 5

INTERNATIONAL COMPARISON · 6.5.2

Cross-cutting comparison matrix

The comparison helps identify transferable tools without confusing maturity with institutional replicability.

SPAIN		Advanced position and relevant operational experience, with uneven territorial implementation and a need for greater coordination between permits, authorities and decision-making levels.		
CRITERION	FRANCE	PORTUGAL	AUSTRALIA	ISRAEL
Framework	State-level and sectoral by use	Specific ApR regime	Federal soft law + state regulation	Public resource and national standard
Permits	Prefectural authorisation	Production/use licence and notification	Permits and plans by State	Centralised allocation
Quality	Classes A-D and A+	Fit-for-purpose by use	DALY and LRV targets	Single high standard
Risk	Barriers + assessment	Assessment + multi-barrier	Preventive core of the model	High, integrated control
Governance	Centralised and sectoral	Centralised (APA)	Federal-state decentralised	Highly centralised and integrated

WHAT EACH REFERENCE CONTRIBUTES

FRANCE Proportionality by use and exposure.		PORTUGAL Regulatory proximity and a fit-for-purpose approach.	
AUSTRALIA Preventive and operational risk management.		ISRAEL Integrated planning and large-scale implementation.	
KEY		Useful transfer selects principles and tools - risk management, proportionality, clear responsibilities and planning - rather than complete institutional architectures.	

TRANSFER TO THE SUDOE CONTEXT

01 Proportionality	02 Preventive risk management	03 Planning and clear responsibilities
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INTERNATIONAL COMPARISON · 6.5.3

Maturity and transferability

Greater maturity does not necessarily mean greater transferability to the Spanish and SUDOE context.

SYSTEM	M1 Regulatory	M2 Operational	M3 Institutional	M4 Risk	M5 Overall	TRANSFERABILITY
SPAIN	4	4	3	4	4	Reference baseline
FRANCE	3	2	3	4	3	Medium
PORTUGAL	4	3	4	4	4	High
AUSTRALIA	4	4	4	5	4	Medium · high methodological value
ISRAEL	4	5	5	4	5	Medium

MATURITY SCALE

1 · very low	2 · low	3 · medium	4 · high	5 · very high
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EXECUTIVE READING

HIGHEST MATURITY	Israel has the most consolidated overall profile; Australia stands out especially in risk management.
HIGHEST TRANSFERABILITY	Portugal offers the most direct adaptation to the Spanish and SUDOE framework.
KEY LEARNING	Australia provides the most useful methodological approach for operationalising risk management.

WHAT TRANSFERABILITY MEANS

01 Do not copy institutions	02 Do transfer tools	03 Adapt to the Spanish and SUDOE framework
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REUSE MODELS · 7.2.9

Relative viability of the models

The assessment compares five dimensions. A high score indicates a more favourable condition.

MODEL	Legal	Technical	Economic	Governance	Replicability
Agricultural with user community	4	3	3	2	5
Urban-municipal	4	3	3	3	4
Recreational / tourism	4	4	4	3	3
Single industrial user	5	4	5	4	5
Multi-user / shared network	3	3	3	2	4
Environmental / recharge	3	3	2	2	3
Decentralised / local	3	3	3	3	3
Strategic substitution	5	3	4	2	5

The assessment of decentralized or proximity-based models should be interpreted in light of the institutional context of each country. Differences in the degree of centralization of water management and in the allocation of competences, as well as the composition of the cases analyzed, may influence the available evidence on their performance. Therefore, the score should not be understood as reflecting an inherent advantage or disadvantage of the model, but rather as a context-specific assessment.

IMPLEMENTATION PROFILES

MOST FAVOURABLE Single industrial user	HIGHEST REPLICABILITY Agricultural and strategic substitution
CONDITIONAL Multi-user and environmental/recharge	BALANCED Urban and recreational/tourism
READING	There is no universally superior model. Scale alone does not determine viability; the centralised/decentralised comparison should be read with caution because governance and case samples differ across countries.

IMPLEMENTATION PRIORITY

01 Well-defined users	02 Simple governance	03 Verifiable environmental benefit
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REUSE MODELS · 7.3

Risk map

Complexity is distributed across legal, operational, economic and governance/social dimensions.

MODEL	Legal	Operational	Economic	Governance	Social	Overall
Agricultural	4	4	4	4	3	4
Urban	3	4	4	3	4	3
Recreational	3	3	3	2	4	3
Industrial	2	3	2	2	1	2
Multi-user	5	5	4	5	3	5
Environmental / recharge	5	5	5	5	4	5
Decentralised	3	5	4	3	3	4
Strategic substitution	4	3	4	4	2	3

SCALE: 1 = LOW RISK · 5 = HIGH RISK

HIGHEST RISK	Multi-user and environmental/recharge
MOST FAVOURABLE PROFILE	Single industrial user
MITIGATION LEVER	Design contracts, controls, contingencies and governance from the outset

FIVE PRACTICAL RESPONSES

01 Clear permits	02 Robust operation	03 Contractual demand	04 Defined responsibilities	05 Communication and control
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lytical basis: Section 7.3

REUSE MODELS · 7.4

Traffic-light assessment of replicability conditions

An experience is replicable only when the conditions that explain its success can be reproduced.

	FAVOURABLE Condition demonstrated	CONDITIONAL Requires measures or additional information	CRITICAL Must be resolved before considering it replicable
CONDITION	FAVOURABLE	CONDITIONAL	CRITICAL
Resource	Stable flow and characterised quality.	Seasonal variation or manageable episodes.	Insufficient, unstable or unknown flow.
Demand	Users identified and commitments formalised.	Likely, seasonal or non-binding demand.	No actual users or insufficient volume.
Planning and environment	Compatible and reduces pressure on resources.	Requires studies, conditions or adjustments.	Risk of deterioration or impacts on third parties.
Authorities and permits	Authorities, reports and sequence defined.	Several authorities, but coordination is viable.	Uncertainty or incompatibility between permits.
Risk management	Operational plan, barriers and clear responsibilities.	Plan under development and reinforcements identified.	Formal plan or controls insufficient.
Infrastructure	Proximity and viable networks or routes.	New works affordable and authorisable.	Unviable distance, cost or impacts.
Economic model	Costs, tariffs and financing secured.	Viable with grants or tariff adjustments.	No financing or ability to pay.
Governance	Clear operator, contracts and responsibilities.	Agreements pending with clear leadership.	Gaps, overlaps or no operator.
Operational capacity	Qualified operator, controls and contingencies.	Gaps that can be addressed with support or training.	Lack of staff, maintenance or monitoring.
Social acceptance	Information, signage and participation.	Concerns manageable through communication.	Rejection or lack of transparency.
Phased implementation	Pilot, modularity and progressive expansion.	Limited flexibility and high initial investment.	Full scale only, without secured demand.
Adaptive monitoring	Indicators, review and continuous improvement.	Basic monitoring still to be expanded.	No measurable targets or review.
CRITERION	A critical condition does not necessarily make the project impossible, but it prevents it from being considered replicable until a sufficiently defined solution exists.		



CASES ANALYSED · CHAPTER 8

16 references for comparing models

Schematic and fully editable territorial representation. Complementary cases are explicitly identified.

16 cases and references	12 SUDOE	4 international	2 complementary
SPAIN · 6 cases	01 Murcia / ESAMUR · Regional agricultural 02 Alicante–Vega Baja / Benidorm · Mediterranean multi-use 03 El Prat reclamation facility / Llobregat Delta · Strategic environmental 04 Costa Brava / Girona · Territorial multi-use 05 Chiclana de la Frontera · Tourism and golf 06 Canal de Isabel II / Madrid · Metropolitan multi-use		
PORTUGAL · 2 cases	07 Lisbon / Beirolas / Água+ · Non-potable urban 08 Algarve / Quinta do Lago–Vilamoura · Tourism and golf		
FRANCE · 4 references	09 Argelès-sur-Mer · Mediterranean agricultural 10 Nice / Haliotis · Non-potable urban 11 Irri-Alt'Eau / Narbonne–Gruissan · Mediterranean viticulture 12 Sainte-Maxime · Tourism and golf · complementary		
AUSTRALIA · 3 references	13 Sydney Olympic Park / WRAMS · Urban dual network 14 Perth Groundwater Replenishment · Aquifer recharge 16 Western Treatment Plant / Werribee · Agricultural and environmental.		
ISRAEL · 1 reference	15 Shafdan · Structural agricultural		

Analytical basis: Chapter 8

16 cases, six lessons that recur

LOCATION OF ANALYSED CASES AND REFERENCES

CHAPTER 8

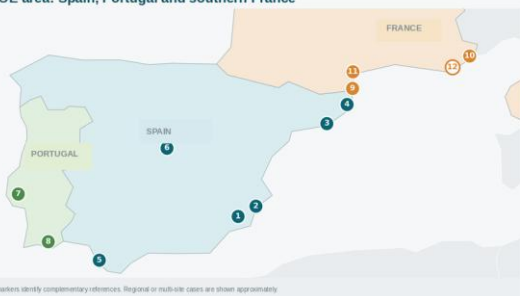
16 cases and references

12 in the SUDOE area

4 international references

2 complementary cases

SUDOE area: Spain, Portugal and southern France



International comparison references



Cases analysed and main typology

- | | | | |
|--|---|--|---|
| 1 Region of Murcia / ESAMUR
Regional agricultural | 7 Chiclana de la Frontera
Tourism and golf | 13 Argelles-sur-Mer
Mediterranean agricultural | 15 Sydney Olympic Park / WRIAMS
Urban dual network |
| 2 Alicante-Vega Baja / Benisidorm
Mediterranean multi-use | 8 Canal de Isabel II / Madrid
Metropolitan multi-use | 14 Nice / Hailidis
Non-potable urban | 16 Perth Groundwater Replenishment
Aquifer recharge |
| 3 ERA El Prat / Llobregat Delta
Strategic environmental | 9 Lisbon / Beirões / Águas+
Non-potable urban | 15 Jirón d'Eau / Narbonne-Carissien
Mediterranean residential | 17 Shafdan / Israel
Strategic agricultural |
| 4 Costa Brava / Girona
Territorial multi-use | 10 Algérie / Quinta do Lago-Vilamoura
Tourism and golf | 16 Sainte-Maxime
Tourism and golf complementary | 18 Western Treatment Plant / Werribee
Agricultural and environmental complementary |

Source: own elaboration based on the cases developed in Chapter 6.

Indicative location.

Organised demand

Effective substitution of
conventional resources

Suitable infrastructure

Stable governance

Preventive risk
managementClear allocation of costs
and responsibilities

WHAT THE CASES SHOW

01

Demand structures the
system

02

Governance shapes the
scale and the model.

03

Technology alone is not
enough

STRATEGIC SYNTHESIS

Sector SWOT matrix

A solid technical and regulatory base coexists with coordination barriers, costs and uneven territorial deployment.

STRENGTHS ▪ Consolidated experience in agricultural, urban, tourism and environmental uses. ▪ Mature treatment, disinfection, control and separate-network technologies. ▪ Identifiable demand in agriculture, industry, golf, green areas and urban uses. ▪ Updated EU and national framework with a risk-management approach. ▪ Cases demonstrating resource substitution and protection of water bodies. ▪ Diversity of models and regional, metropolitan and consortium-based management bodies.	WEAKNESSES ▪ Uneven territorial implementation and lack of harmonised criteria. ▪ Fragmented responsibilities and need to coordinate permits and reports. ▪ High treatment, pumping, storage and distribution costs. ▪ Insufficient governance in new or multi-user projects. ▪ Risk of turning the risk management plan into a formal compliance exercise. ▪ Uncertainty over flows, quality, demand and ability to pay.
OPPORTUNITIES ▪ More frequent droughts and growing priority for climate adaptation. ▪ Substitution of drinking, surface or groundwater in non-potable uses. ▪ Aquifer protection and managed recharge. ▪ New tourism and industrial demands, including green hydrogen. ▪ Digitalisation through sensors, automation and traceability. ▪ Economies of scale and financing linked to resilience and the green transition.	THREATS ▪ Conflicts between agriculture, tourism, water supply and conservation. ▪ Social or media rejection if communication is insufficient. ▪ Use of reuse to expand consumption rather than reduce pressures. ▪ High environmental sensitivity in aquifers, wetlands and protected areas. ▪ Rising energy costs and new requirements for emerging contaminants. ▪ Administrative bottlenecks and underuse where contracts and secured demand are lacking.

STRATEGIC DIRECTIONS

BUILD ON STRENGTHS Consolidated cases and measurable benefits.	CORRECT Coordination, demand and responsibilities.	CAPITALISE Substitution, aquifers and economies of scale.	ADDRESS Conflicts, costs and social acceptance.
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STRATEGIC READING

01 Build on strengths	02 Correct weaknesses	03 Seize opportunities without ignoring threats
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Analytical basis: synthesis of cases and barriers

OPERATIONAL RECOMMENDATIONS

Roadmap

Activate, consolidate and transform: three horizons expressing priority and sequence, not closed compartments.

AXIS	ACTIVATE 0–12 months	CONSOLIDATE 1–3 years	TRANSFORM 3–6 years
REGULATORY FRAMEWORK	- Integrated guide to permits, authorities and reports. - Proportionate risk plans.	- Specify compliance points and responsibilities. - Promote effective substitution without increasing demand.	Harmonise criteria and review the framework using common results.
PROJECT DEVELOPERS	- Identify and structure demand: users, uses, volumes and seasonality. - Carry out early screening of resource availability, quality, proximity and variability. - Integrate competences, risk and infrastructure requirements from the design stage..	- Formally confirm resource availability and suitability. - Secure financing, costs and contracts. - Implement the project in phases and manage contingencies.	- Maintain traceability and indicators. - Replicate only when success conditions are confirmed.
PUBLIC AUTHORITIES	- Coordinated dialogue and prior consultations. - Checklists and standardised documentation.	- Inventories of resources, demands and infrastructure. - Support linked to benefits, pilots and capacity building.	Common indicators and inspections geared towards prevention and improvement.
EVOLUTION OF THE MODEL	- Identify replaceable demands and priority areas and, subsequently, the reclaimed water resources capable of meeting them. - Criteria for environmental uses and recharge.	- Integrate reuse into water and territorial planning. - Master plans and stable financing.	- Integrate sanitation and reclaimed water resources. - Adaptive monitoring and SUDOE transfer.

EXPECTED RESULTS

01 Legal certainty	02 Economic viability	03 Environmental benefits	04 Replicability	05 Planned management
TRANSITION				
AUTHORISE STAND-ALONE PROJECTS → COORDINATE PROCEDURES → PLAN DEMAND AND RESOURCES → MANAGE RESILIENT SYSTEMS				

RECOMMENDED SEQUENCE

01 Structure demand and activate the resource	02 Confirm the resource, financing and governance	03 Move towards integrated planning
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Analytical basis: Chapter 9

CONCLUSIONS

Six key conclusions

The study converges on one idea: reuse must move from being an exceptional solution to becoming an ordinary part of water management.

CORE CONCLUSION	The technology is mature. Scaling up depends on the quality of demand, administrative coordination, risk management, financing and governance.	
01 STRATEGIC RESOURCE Integrate it into water and territorial planning to replace abstractions, reduce discharges and strengthen resilience.	02 ADVANCED FRAMEWORK, COMPLEX APPLICATION The priority is to coordinate permits, reports and authorities using predictable and proportionate criteria.	
03 CASE-BY-CASE VIABILITY Viability depends on the fit between demand and the resource, together with distance, infrastructure, energy, financing, governance and risk..	04 RISK AS OPERATIONAL MANAGEMENT The risk management plan must structure barriers, controls, responsibilities and contingencies throughout operation.	
05 SELECTIVE LEARNING Portugal contributes proximity; France, proportionality; Australia, risk management; Israel, integrated planning.	06 FROM AUTHORISING TO PLANNING Move from dealing with individual applications to identifying and structuring demand, confirming the resources capable of meeting it, and prioritising substitution and environmental benefits.	

COMMON SUCCESS CONDITIONS

01 Real and organised demand	02 Validated resource	03 Early coordination
04 Clear governance	05 sustainable financing	06 Adaptive monitoring

FROM EXCEPTION TO ORDINARY POLICY

Reuse will reach its full potential when it is no longer treated as an exceptional solution to scarcity and becomes an ordinary part of decisions on the availability, allocation and protection of water resources.