

Water Pricing for the Future

*Presented at Taiwan International Water Week 2021—Taipei
'Water Leaders Summit-Irreplaceable Water Value'*

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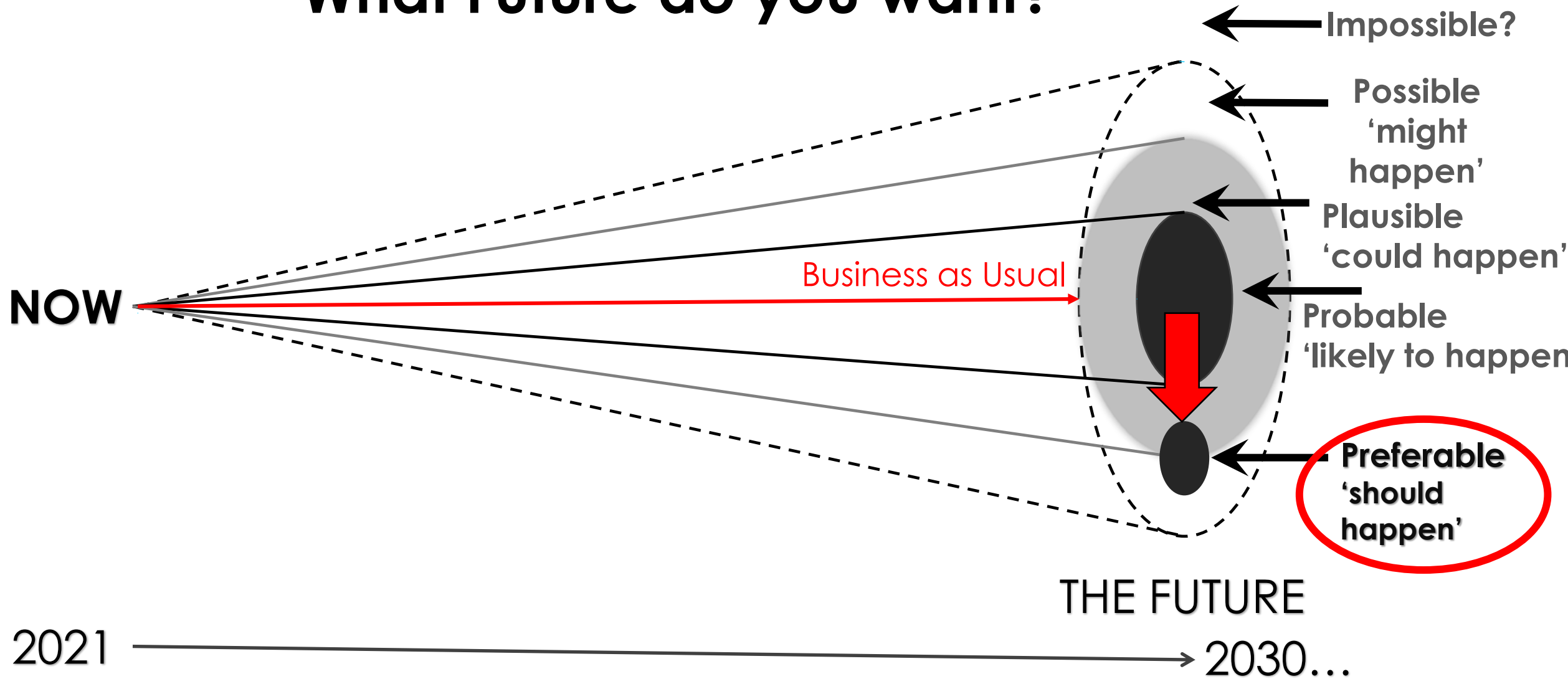
Outline

I. Water Markets

II. Urban Water Pricing

III. Case Study of 'Future' Water Pricing

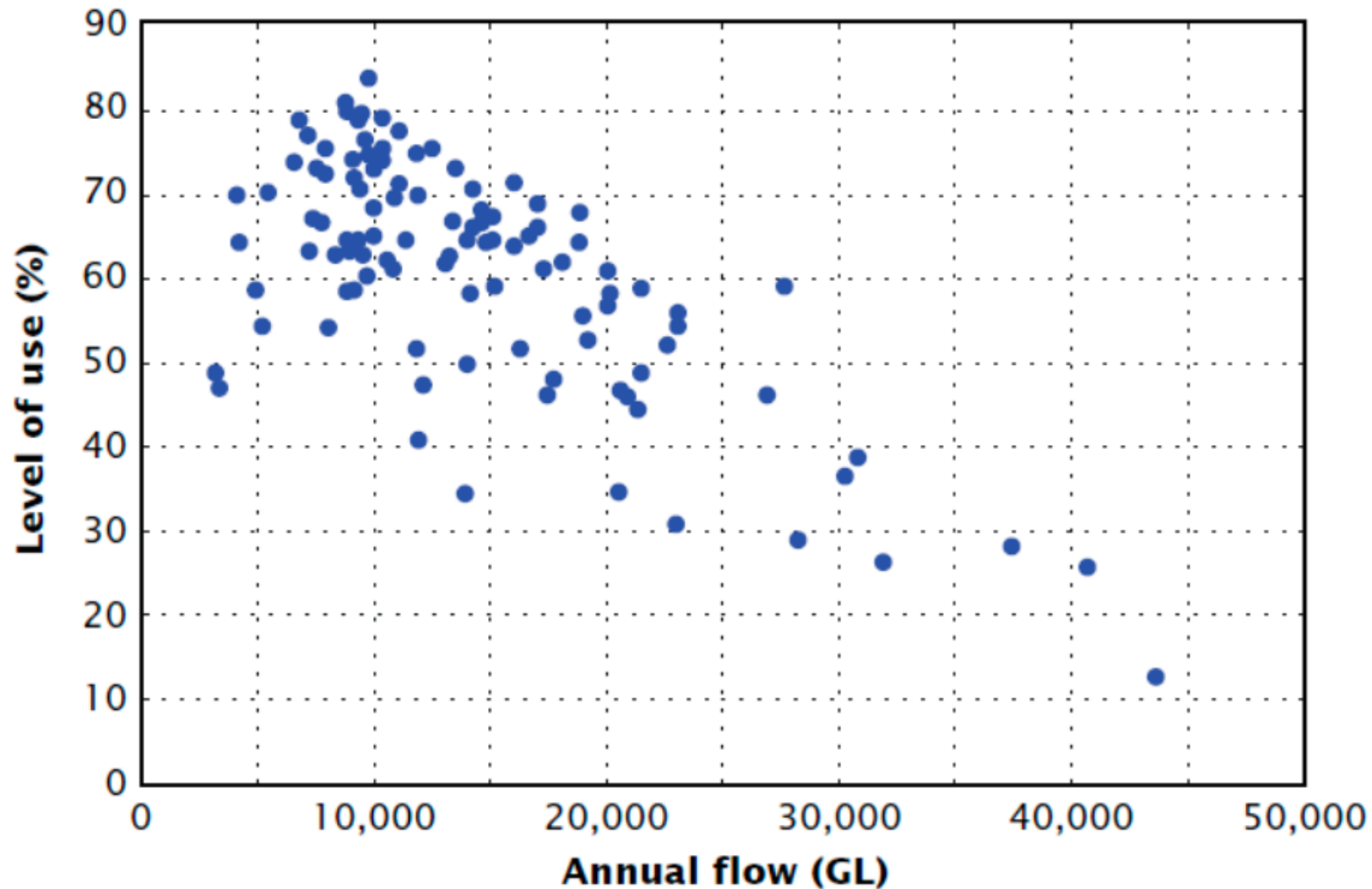
What Future do you want?



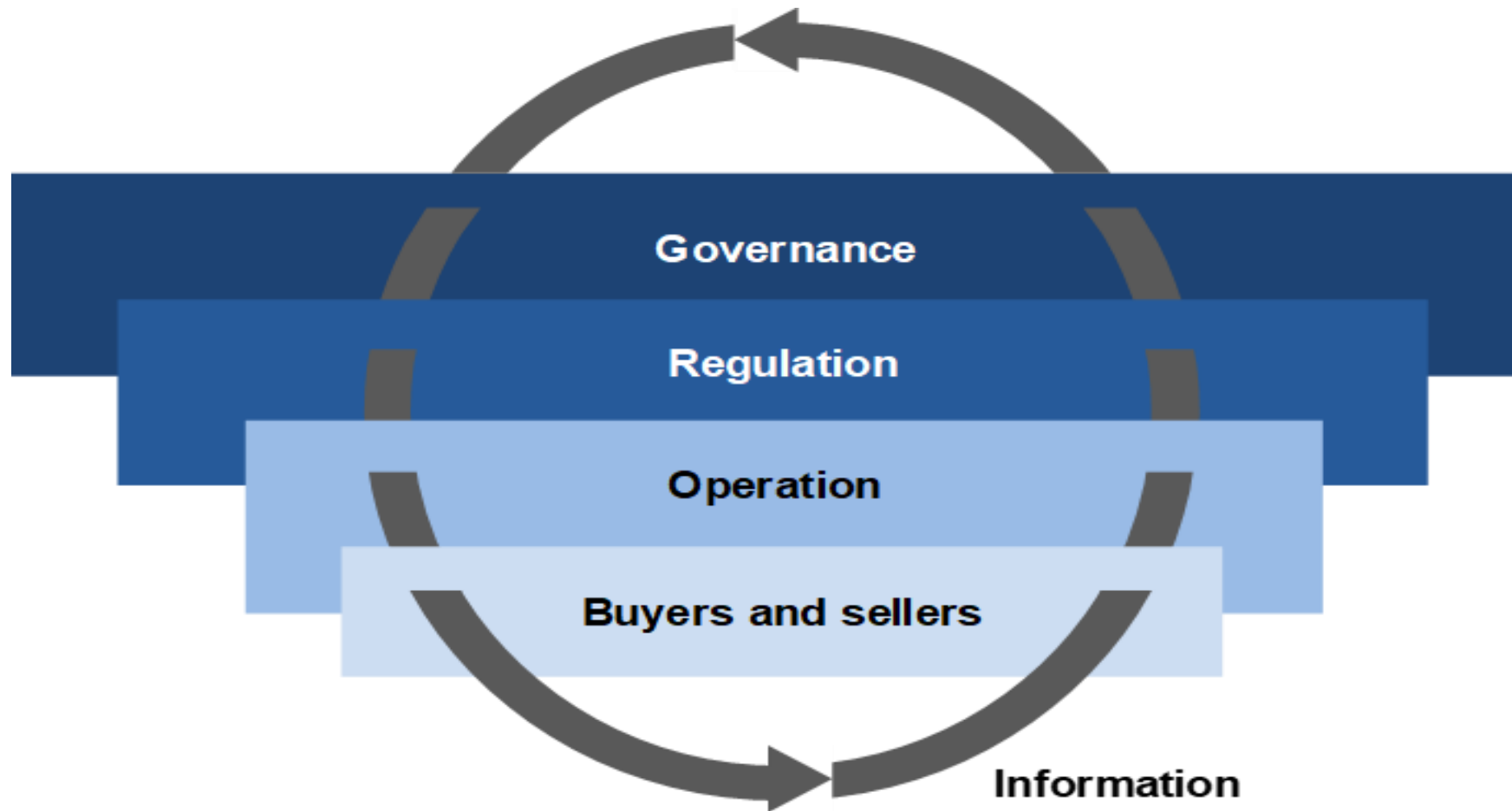
I. Water Markets



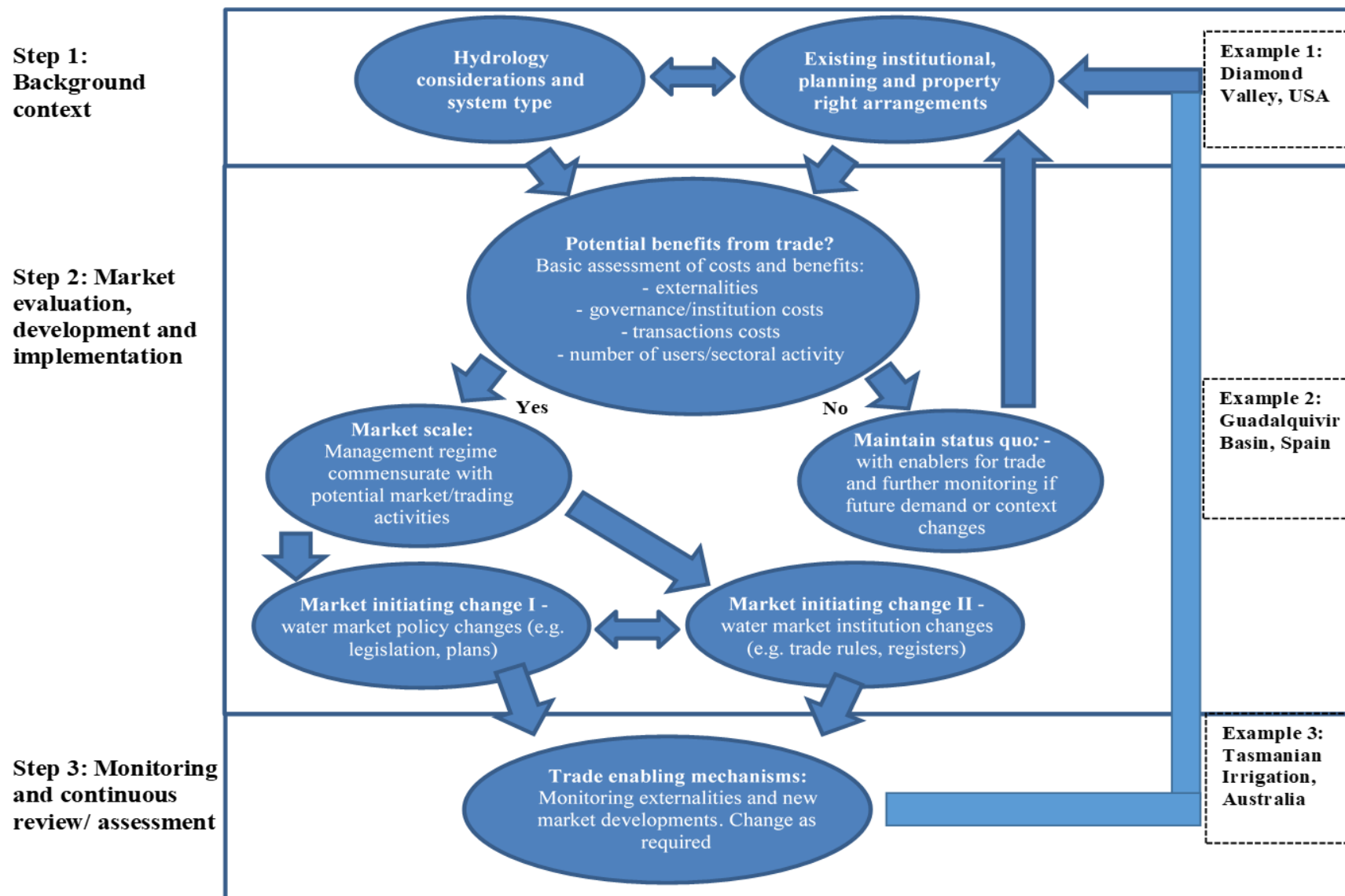
Surface Water use versus Basin natural Stream Flow



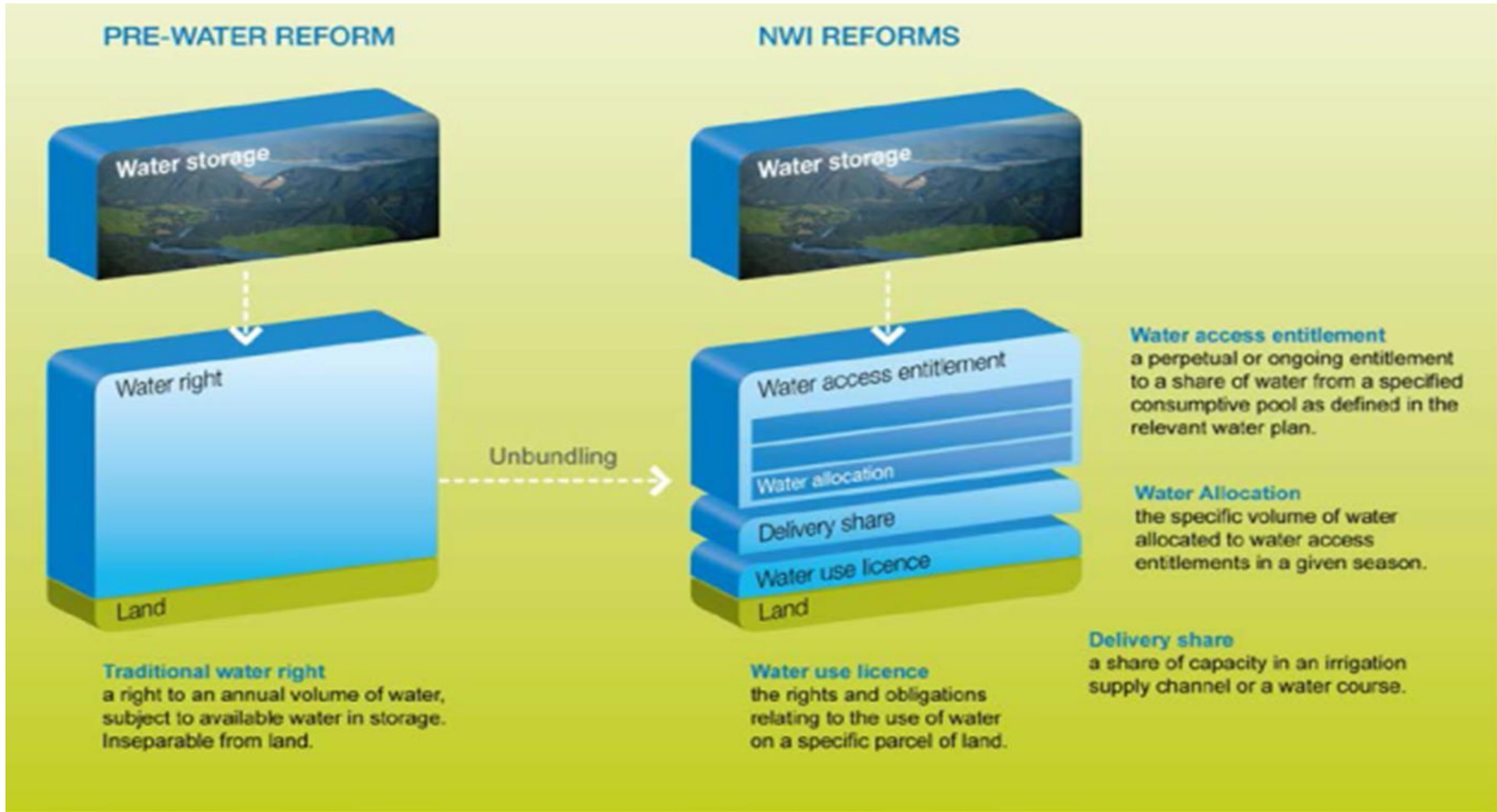
Governance, Regulations & Operations of Markets



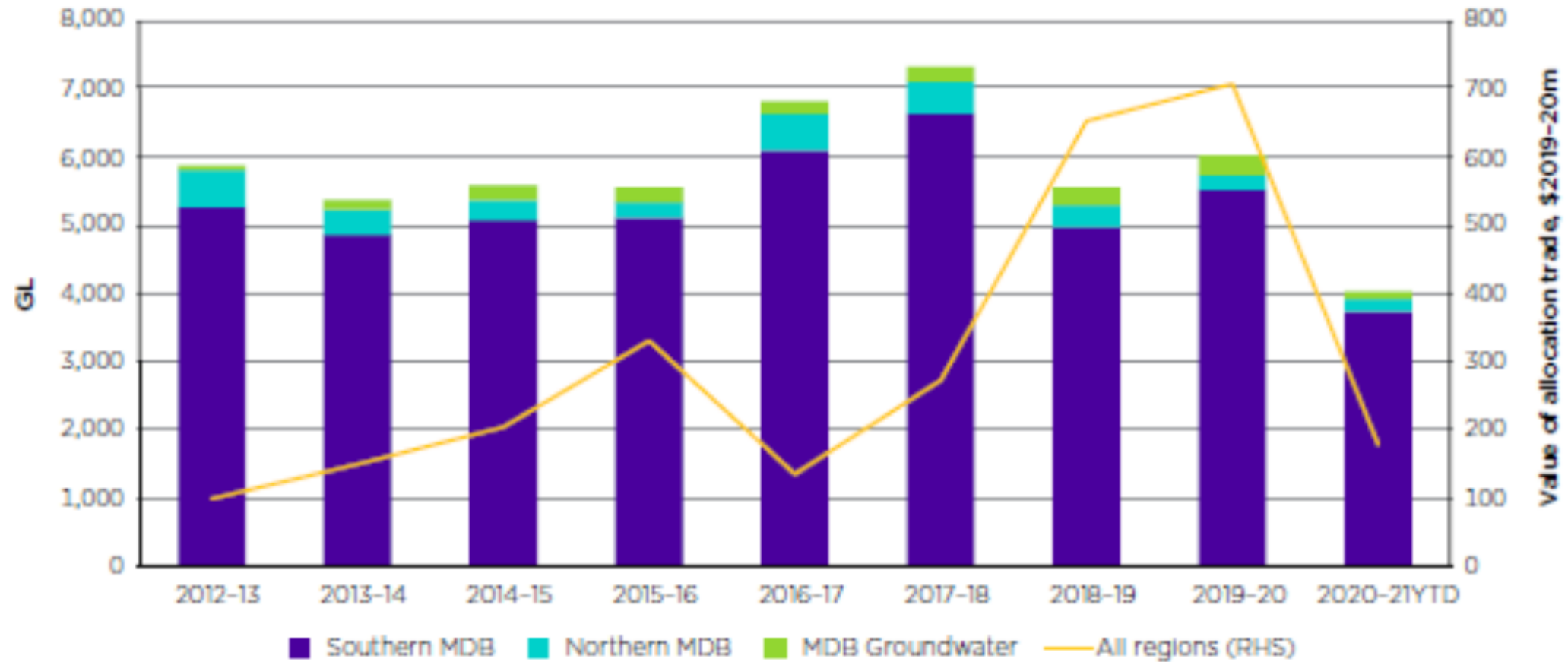
Water Markets Readiness Framework



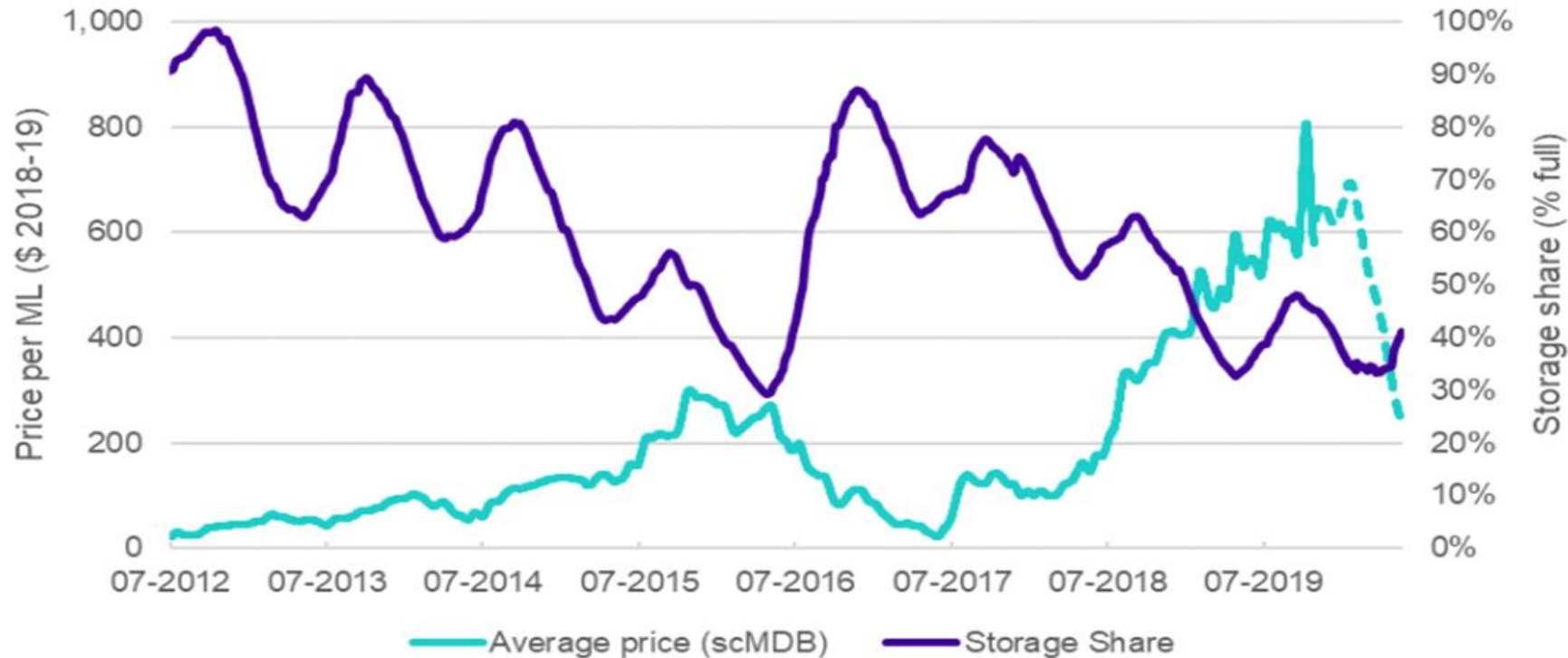
Unbundling of Water Rights



Water Allocations Trading in the Murray-Darling Basin



Water Storages and Water Market Prices



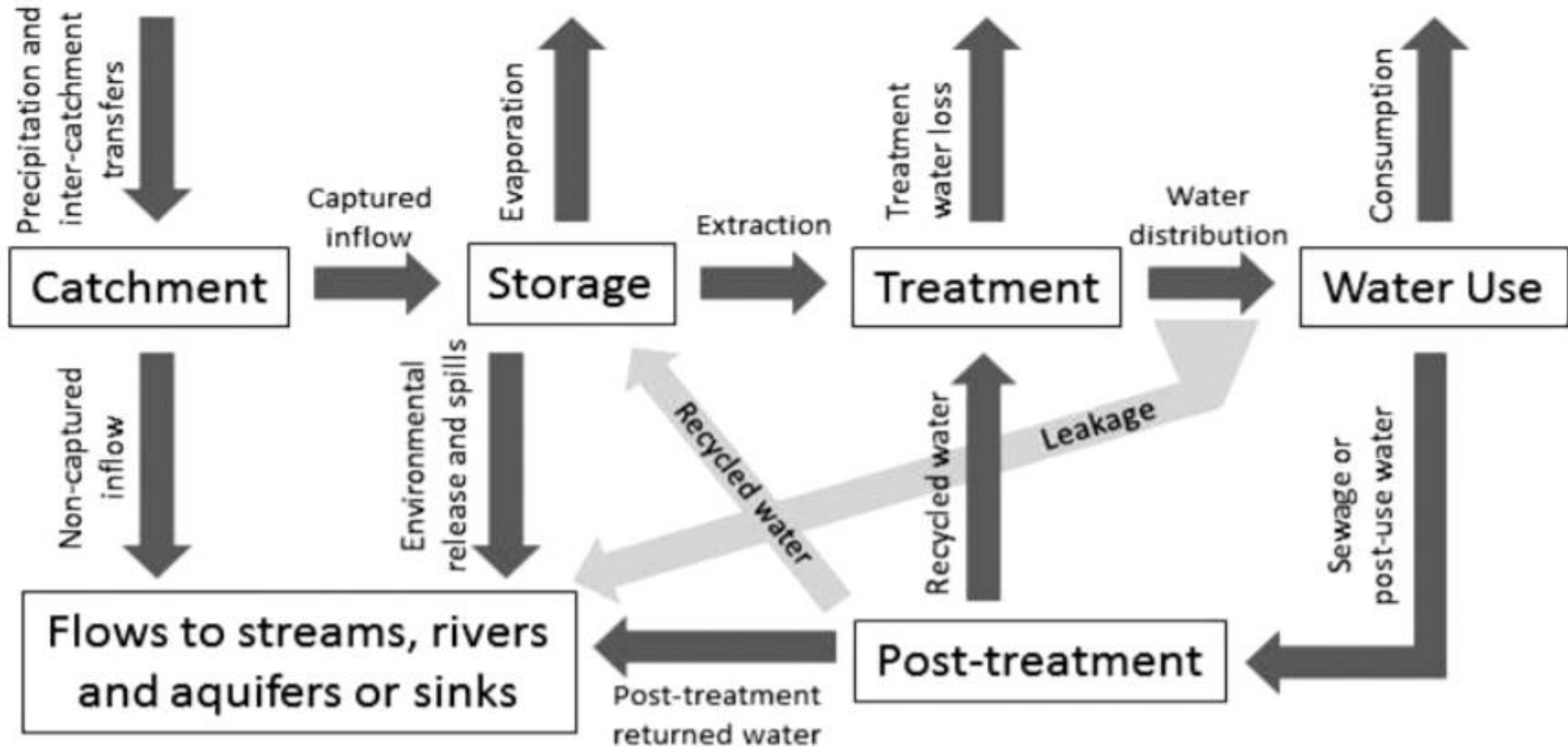
Source: ACCC analysis based on New South Wales, South Australia and Victoria response to voluntary information request, Waterflow data, Bureau of Meteorology (for storage data) and Australian Bureau of Statistics, Cat. No. 6401. Provisional estimates.

Notes: For price series: Basin State voluntary information request data used up until 31 October 2019 (solid line); Waterflow data thereafter (dashed line). VWAP = Volume-weighted Average Price.

II. Water Pricing

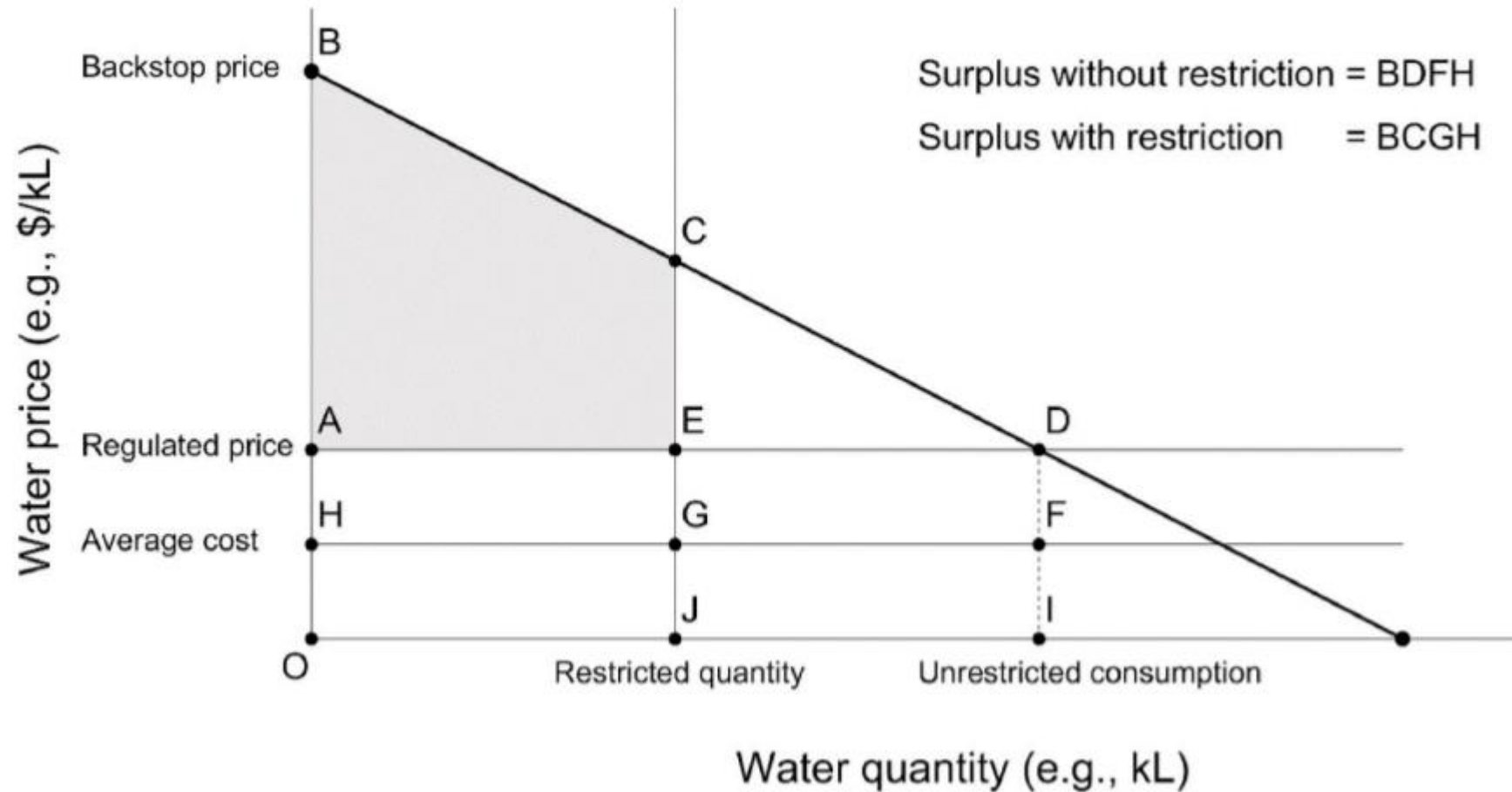


Key Flows and Stocks in an Urban Water Supply



Source: Chu & Grafton, 2018

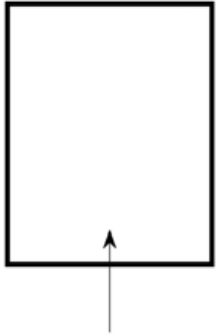
Pricing versus Rationing



Water Tariff Structures

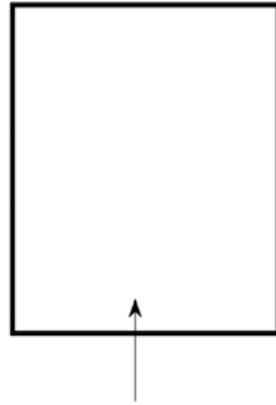
Water tariff

Miscellaneous Charge and Subsidies/Rebates



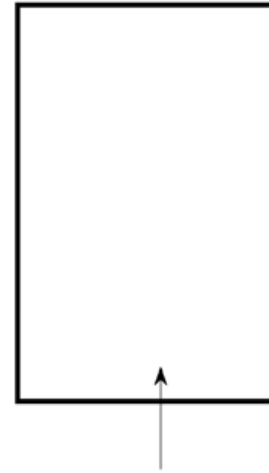
Options include:
(1) connection charge;
(2) targeted rebate

Fixed/Flat Charge



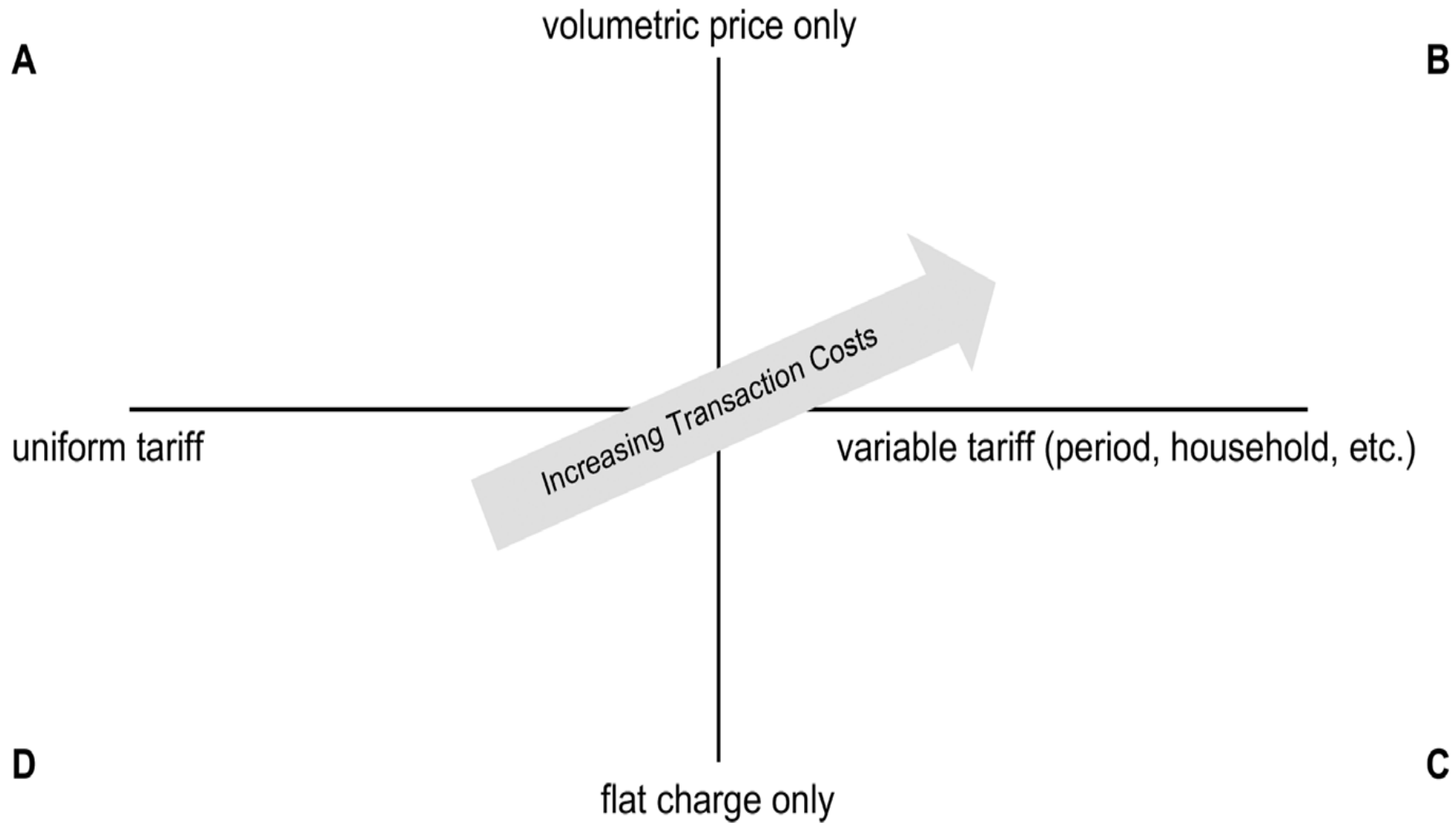
Options include:
(1) uniform charge to all customers
(can vary by time of year)
(2) differential charge that varies
by customers (e.g., on basis of
location)

Volumetric Price

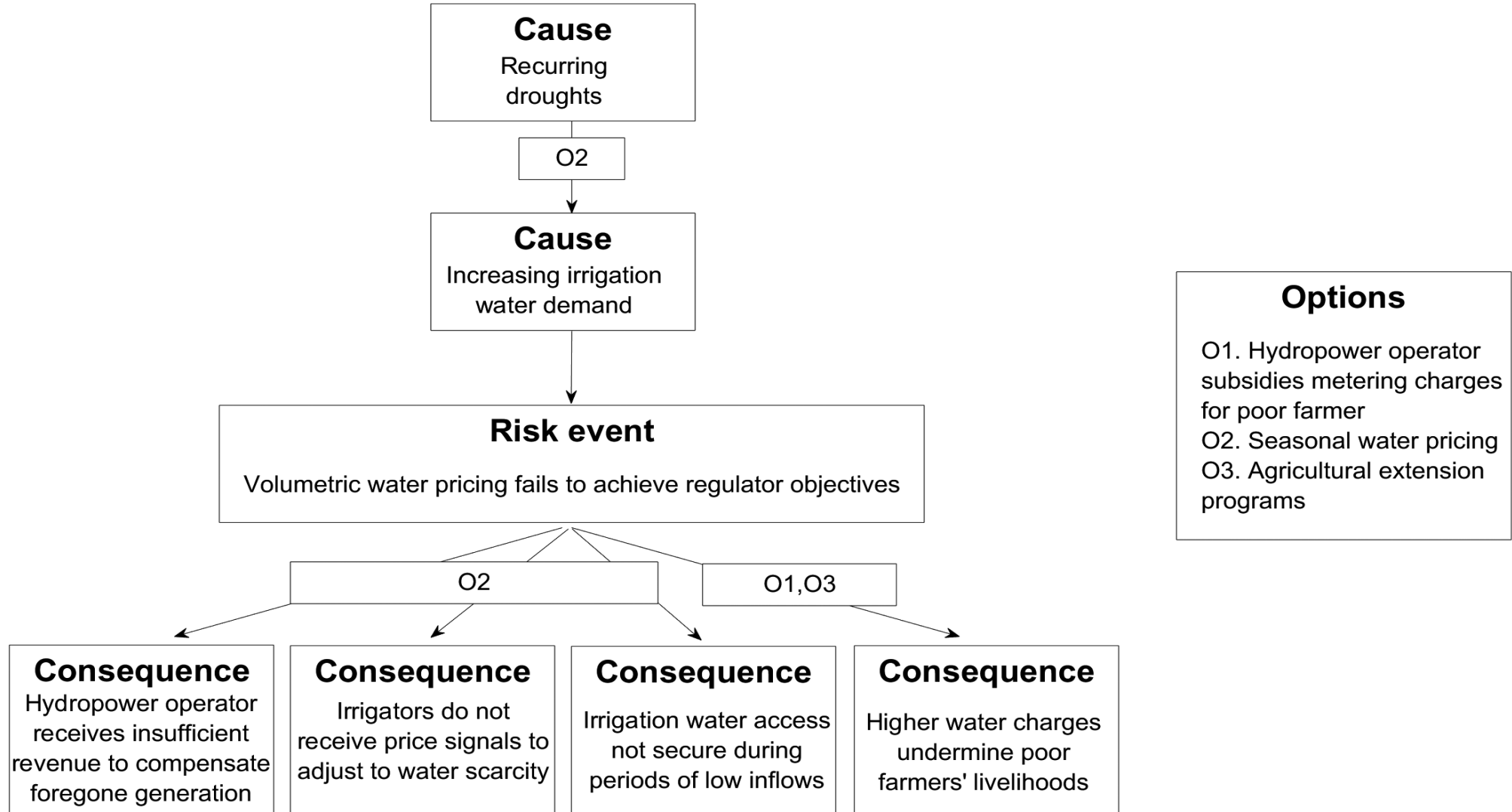


Options include:
(1) uniform charge to all customers;
(2) differential rates that varies with:
(a) amount of consumed (block rate)
(b) season or time of use, and
(c) household characteristics (e.g.,
location)

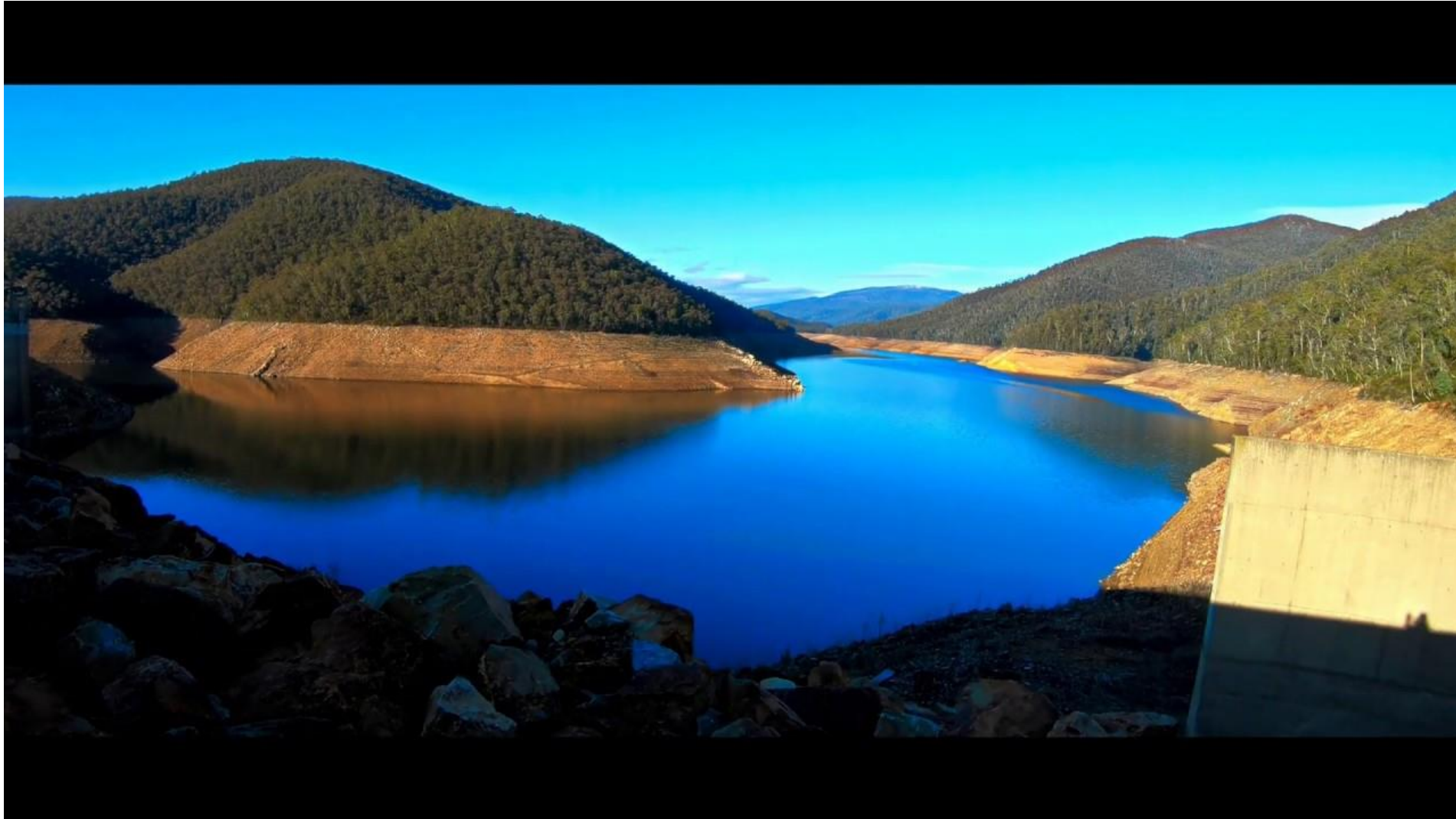
Water Pricing Options



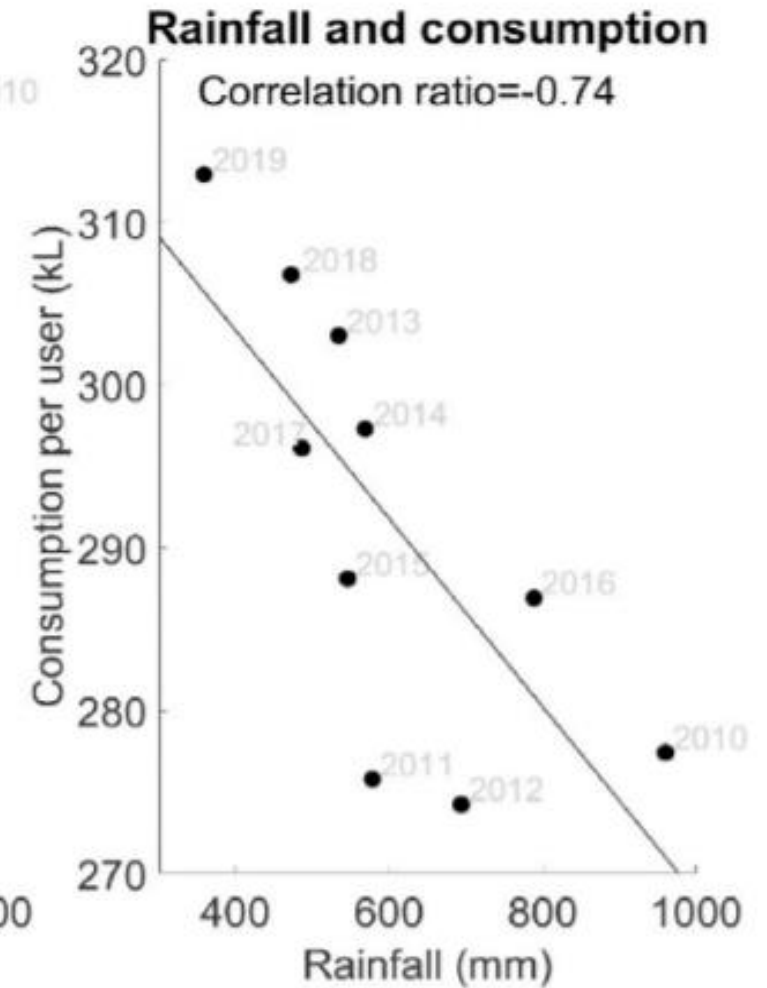
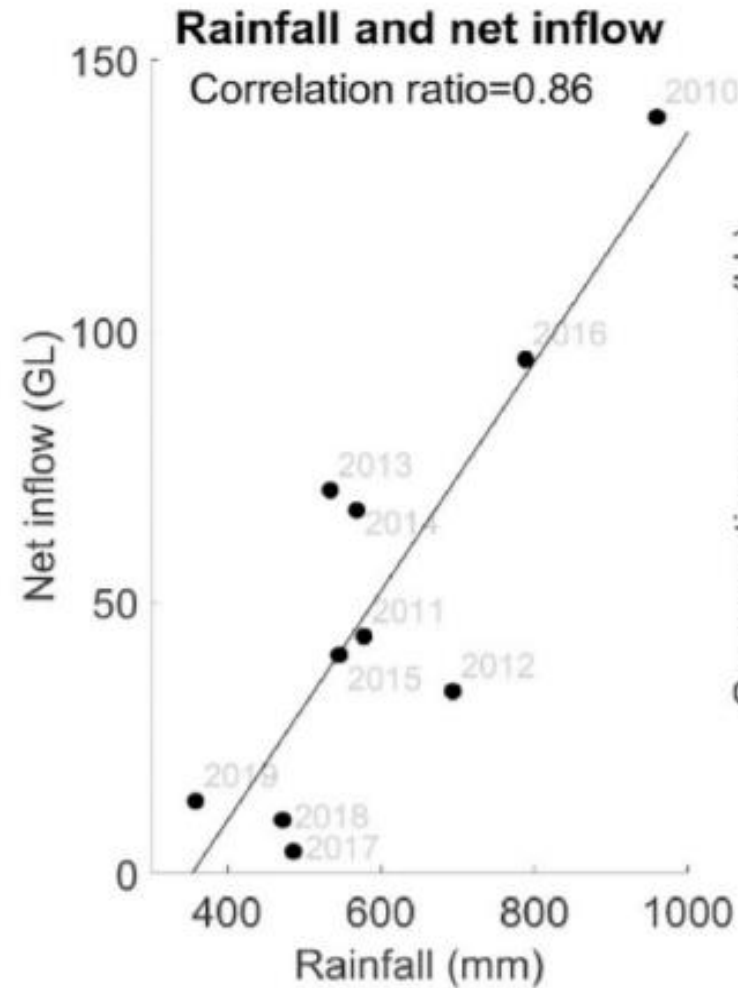
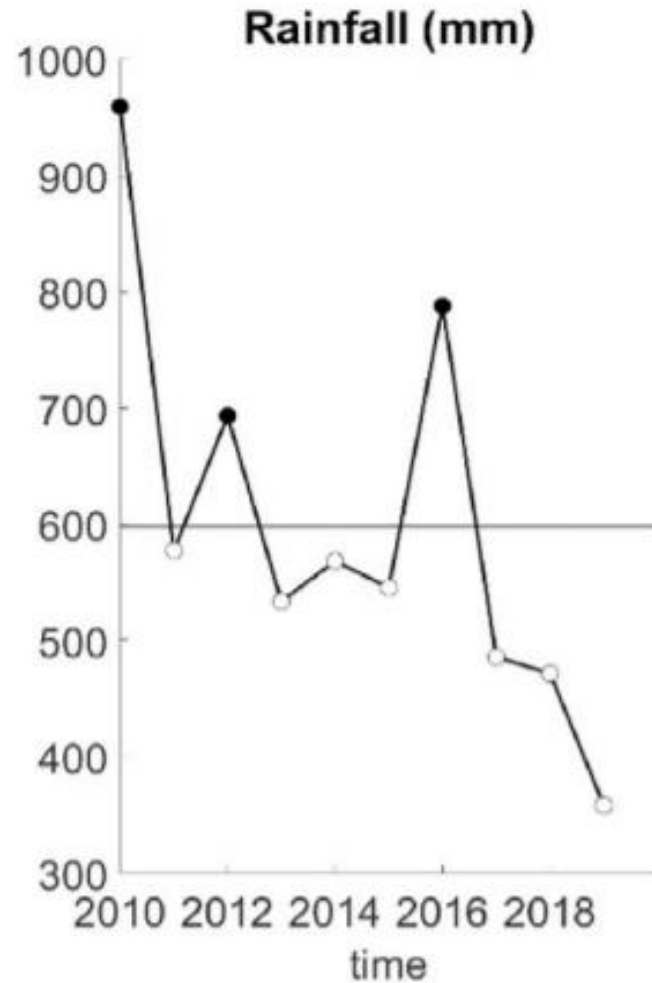
Risks & Options to Respond to Droughts



III. Case Study of 'Future' Water Pricing

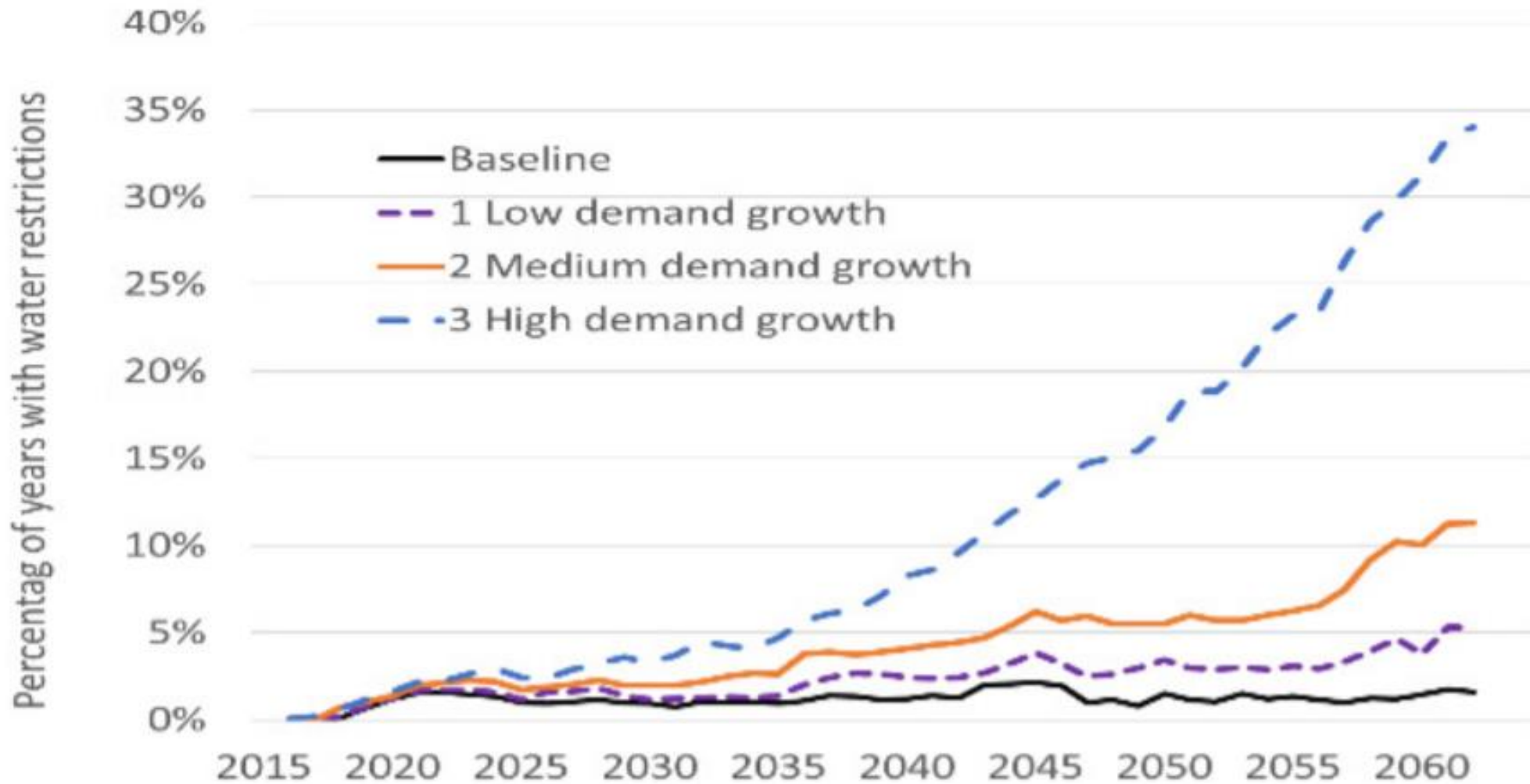


Rainfall, Net Inflows, and Water Consumption



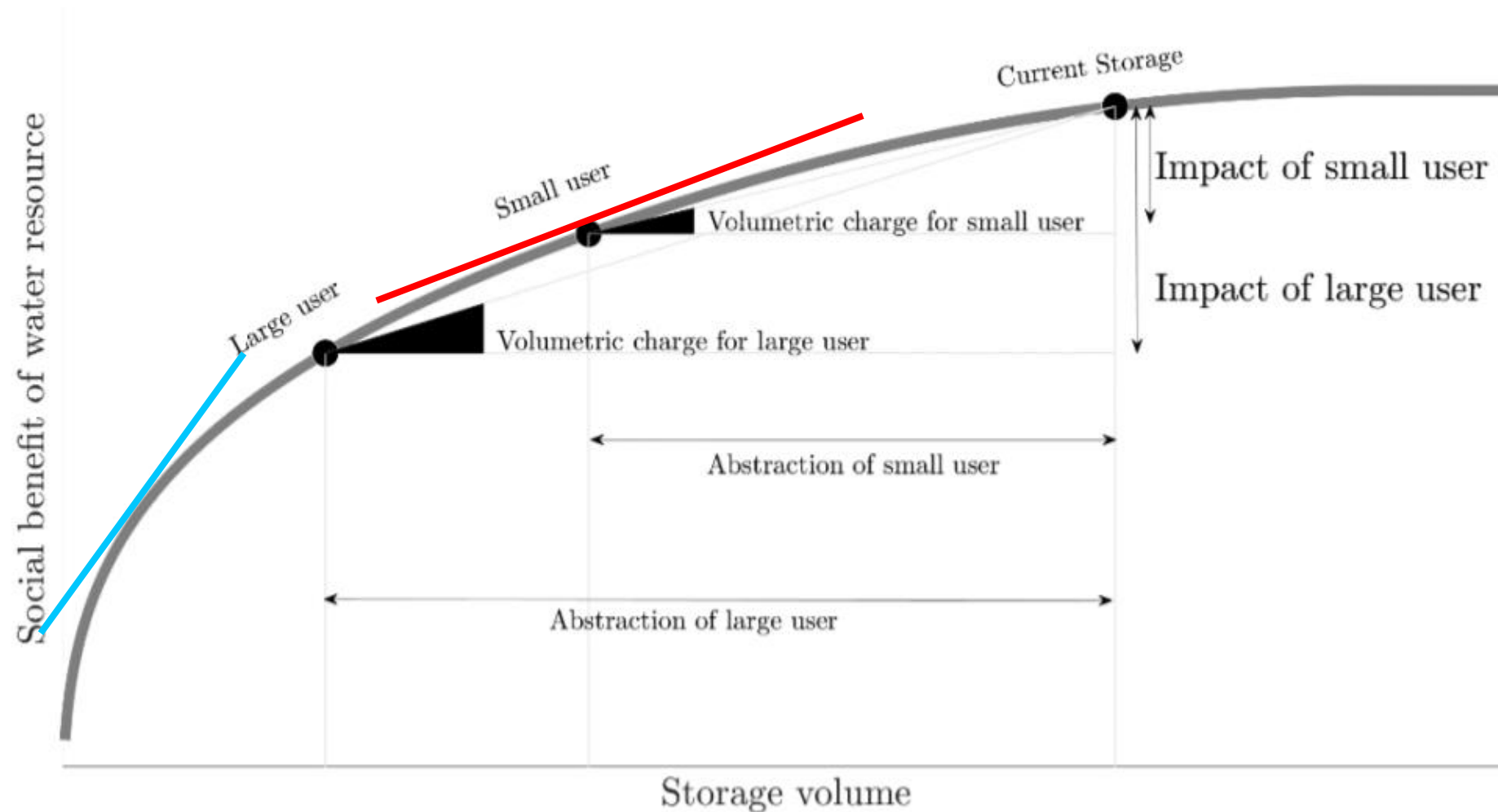
Source: Chu & Grafton, 2021

Probability of Water Restrictions with Population Growth



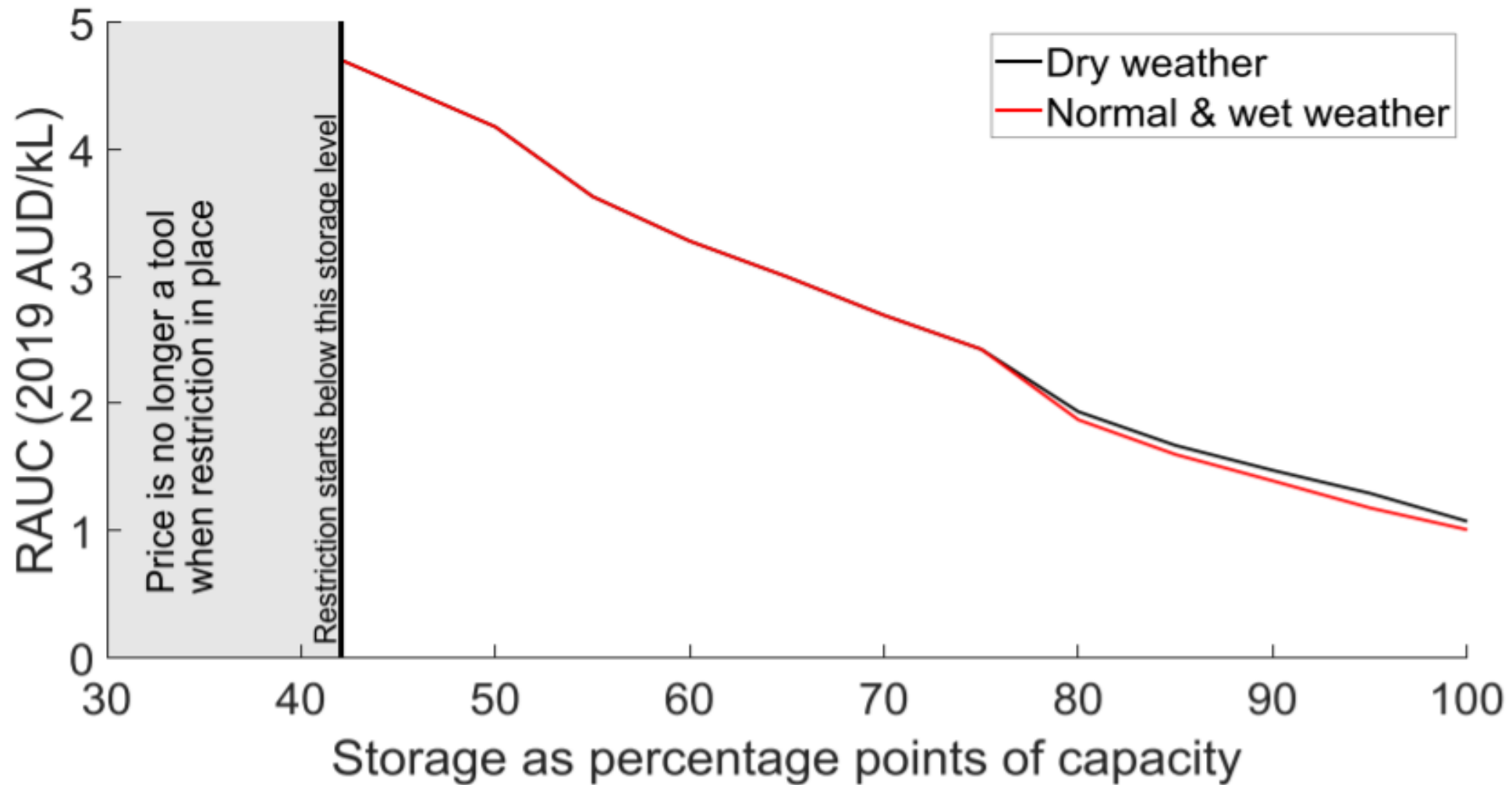
Source: ICRC (2016, f. 4.8)

Water Storages, Water Use and Social Benefit of Water



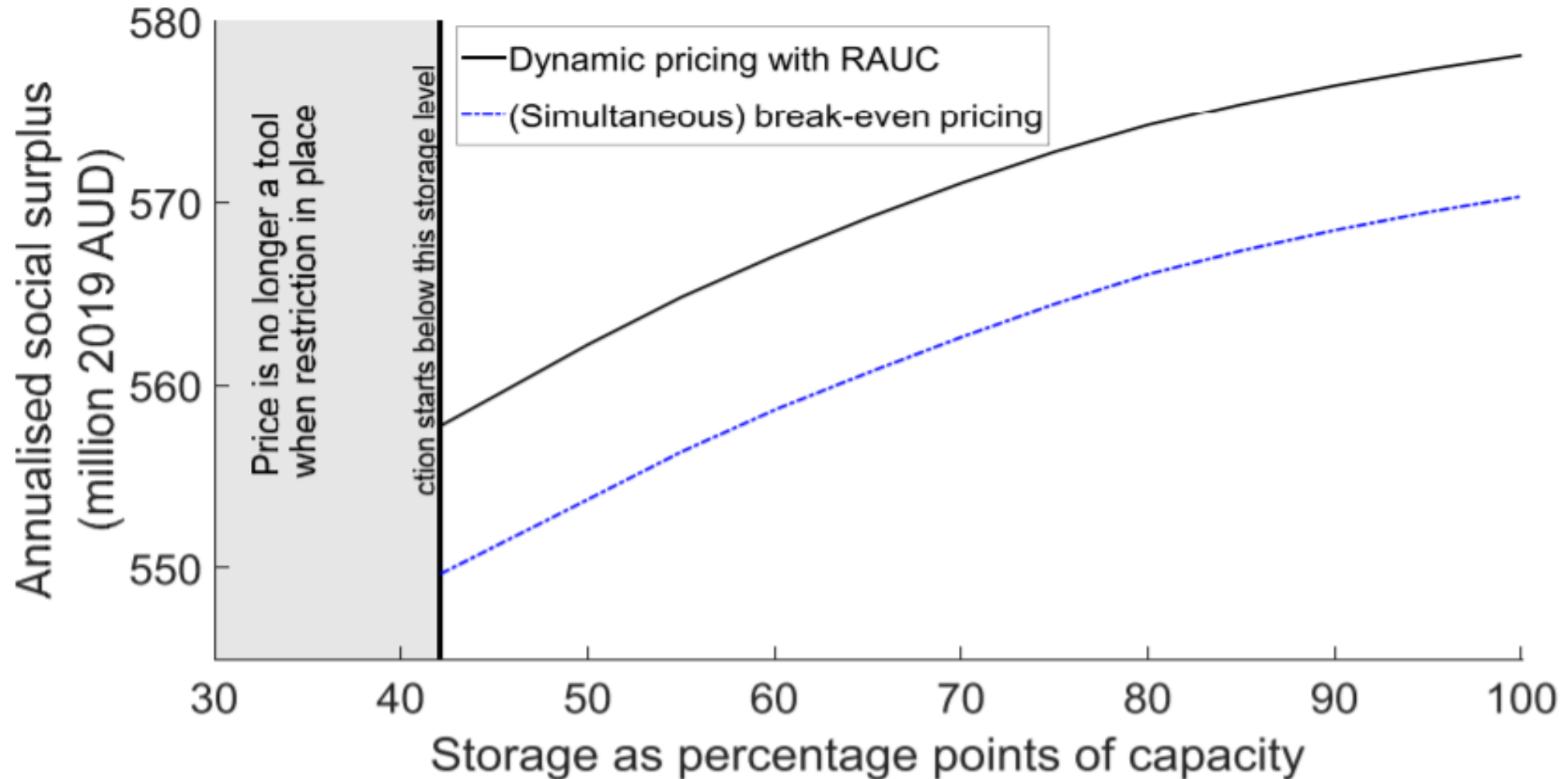
Source: Chu & Grafton, 2019

Risk-adjusted User Cost (RAUC) for the base year 2019



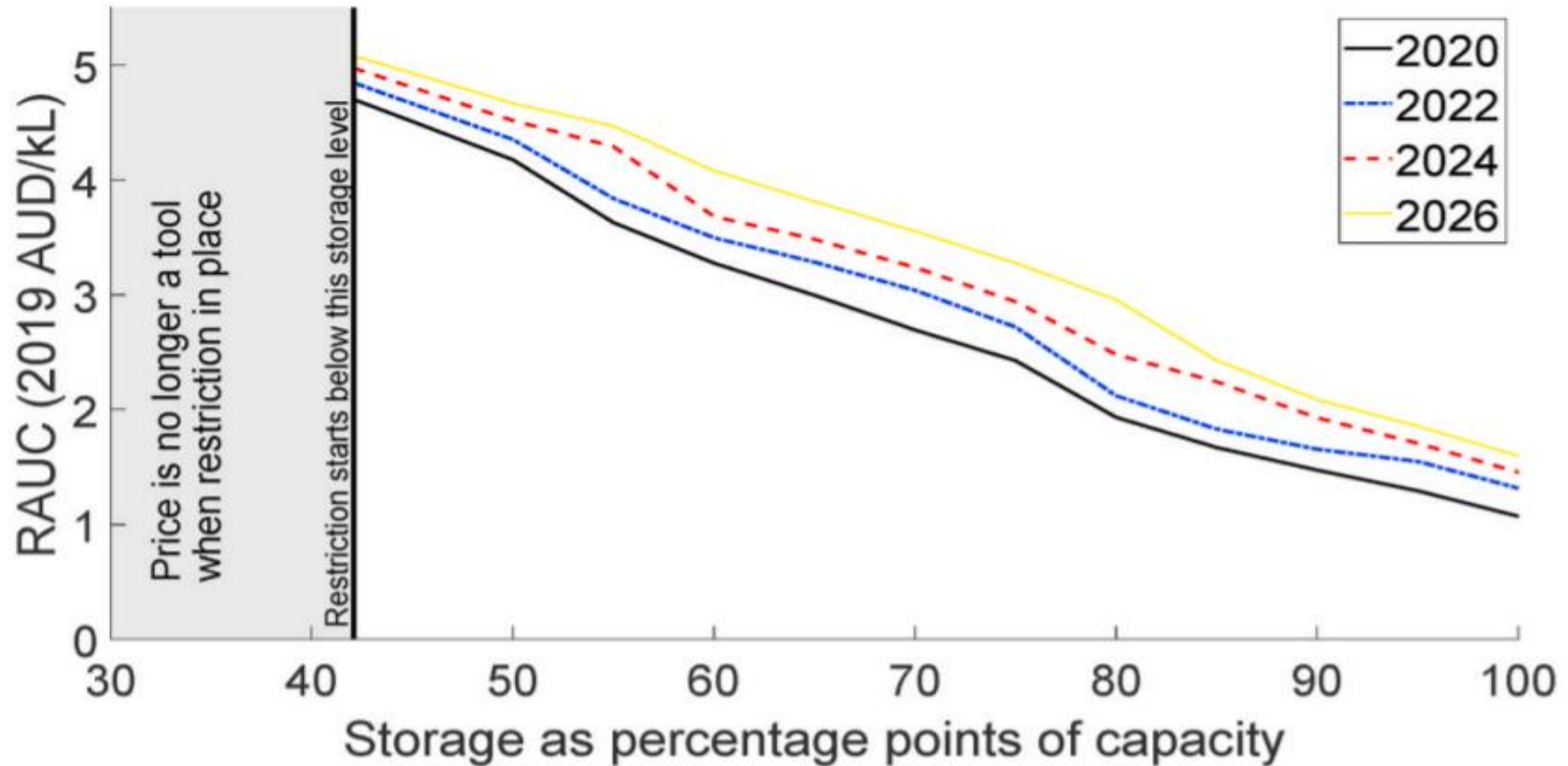
Source: Chu & Grafton, 2021

Optimal Pricing (with Risk-adjusted User Cost)



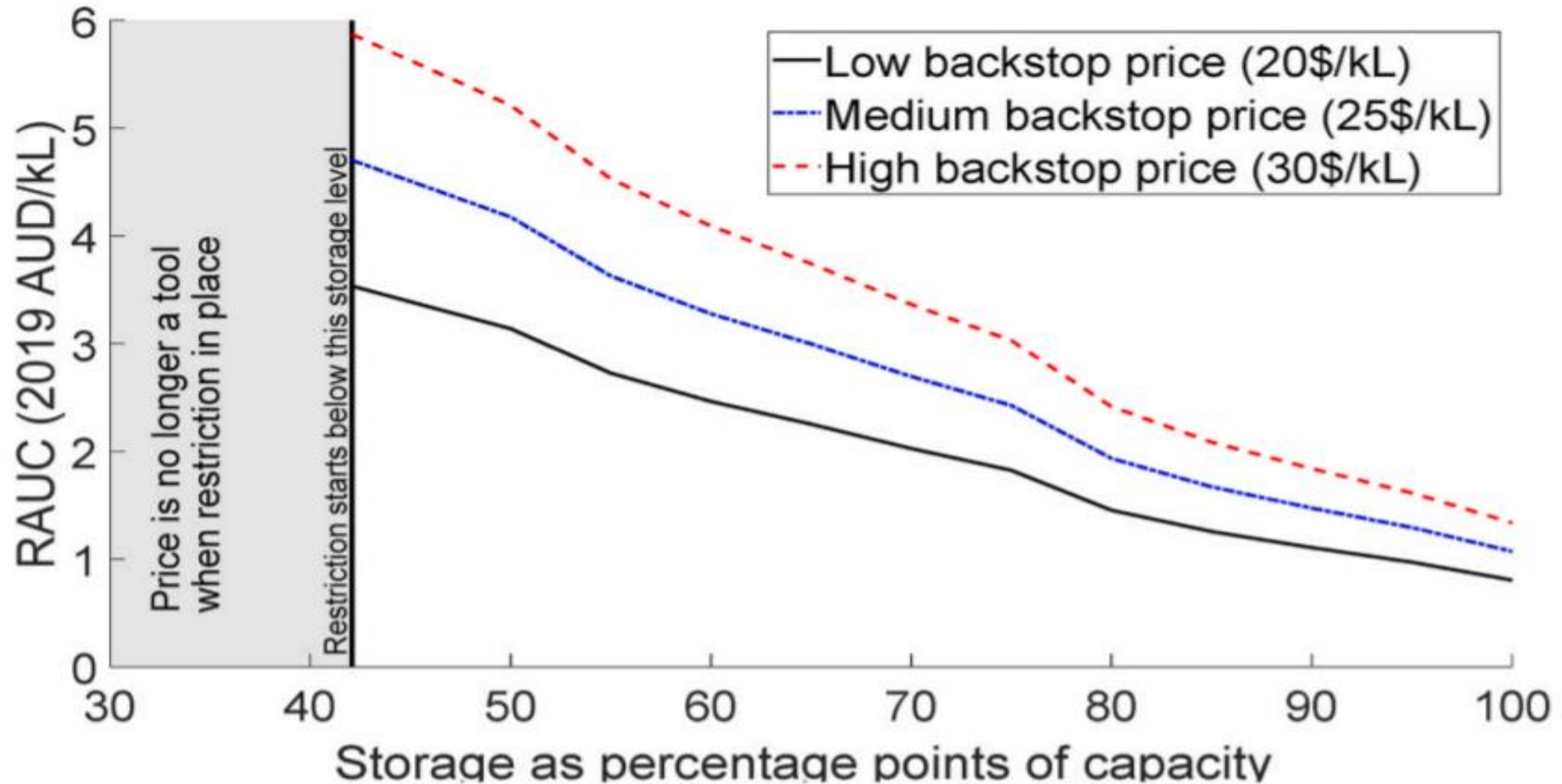
Source: Chu & Grafton, 2021

Inter-temporal Dynamics of Risk-adjusted User Cost (RAUC)



Source: Chu & Grafton, 2021

Effect of 'Backstop' (or alternative water source) Cost



Source: Chu & Grafton, 2021

Thank you!

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Selected Readings

Australian Competition & Consumer Commission (2021). Murray-Darling Basin water markets inquiry - final report. https://www.accc.gov.au/system/files/Murray-Darling%20Basin%20-%20water%20markets%20inquiry%20-%20Final%20report_0.pdf

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