Texas Desal Association

The Real World of Cost, Risk, & Regulations

September 13, 2018

Austin, TX

POSEIDON WATER

- **Poseidon Water is a leading U.S. water infrastructure developer**
  - **Founded in 1995**
  - **Headquartered in Boston, MA with regional presence in CA, FL, and TX**
  - **Public-Private Partnership specialist**
    - **Project development, finance, and long-term operations, maintenance, and management**
  - **Developer of Carlsbad Desalination Plant**
  - **Majority owned by Brookfield Infrastructure Partners**

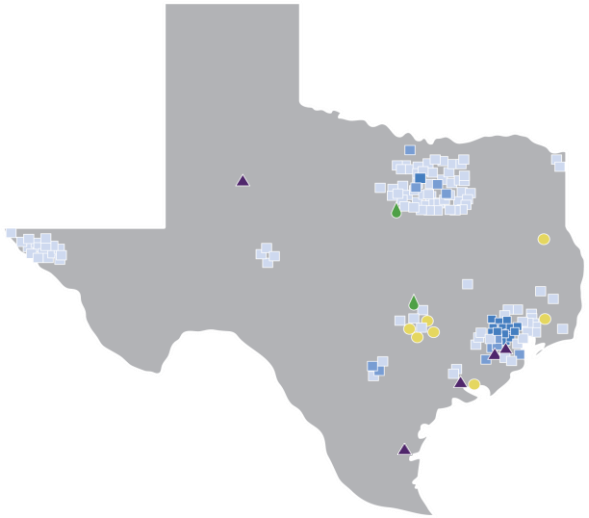
Claude "Bud" Lewis
Carlsbad Desalination Plant

Brookfield

- **Brookfield Asset Management is a global owner and operator of alternative assets**

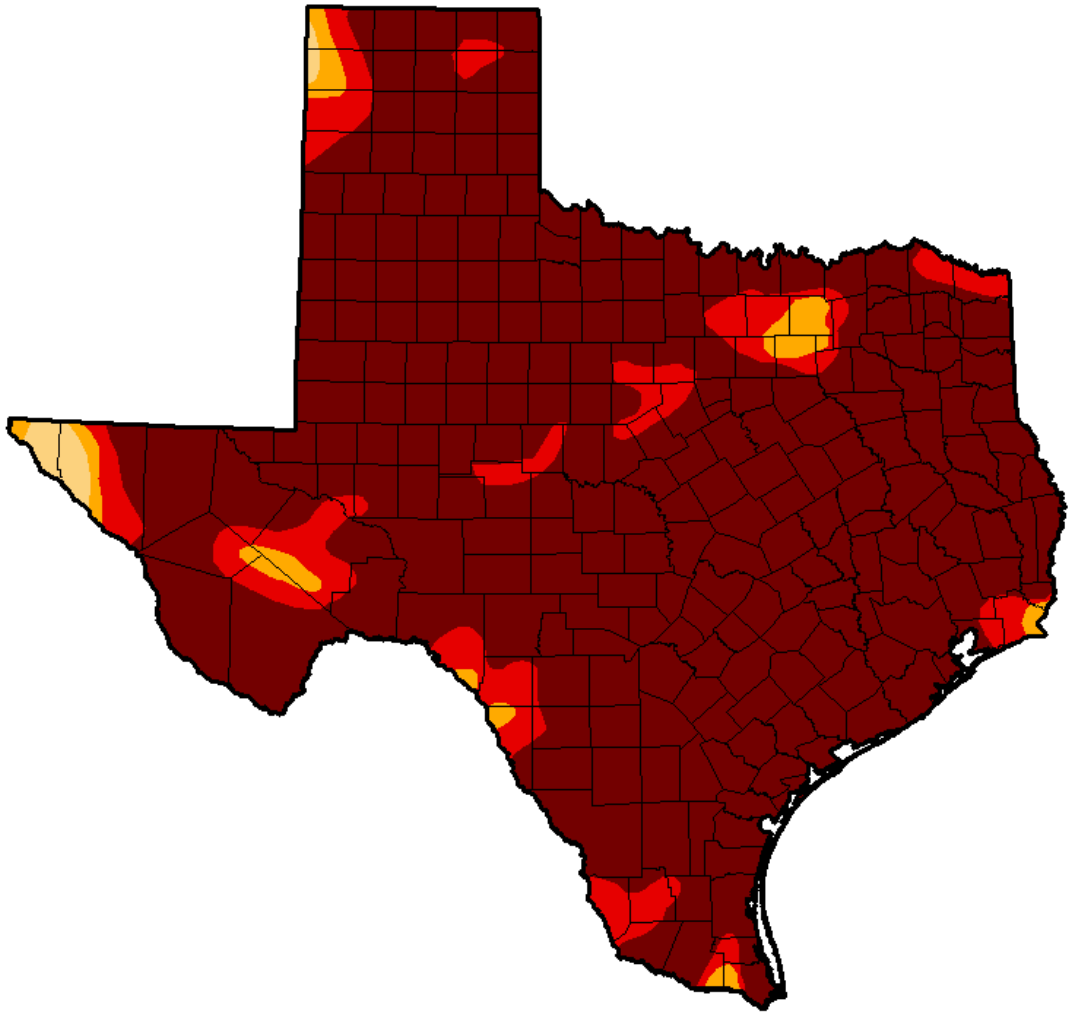
- **Real Estate: $160 billion**
- **Infrastructure: $35 billion**
- **Renewable Power: $43 billion**
- **Private Equity: $28 billion**

- **Brookfield in Texas:**
  - **Assets:** $14.2 billion AUM
  - **Offices:** 13, including Dallas, Houston, Austin, Palacios, Port Lavaca, Nacogdoches, and Jefferson
  - **Projects:** Over 200 projects/assets
  - **Employees:** 962



Over a 115-year Global Investment Track Record

Texas Drought Monitor | August 28, 2018

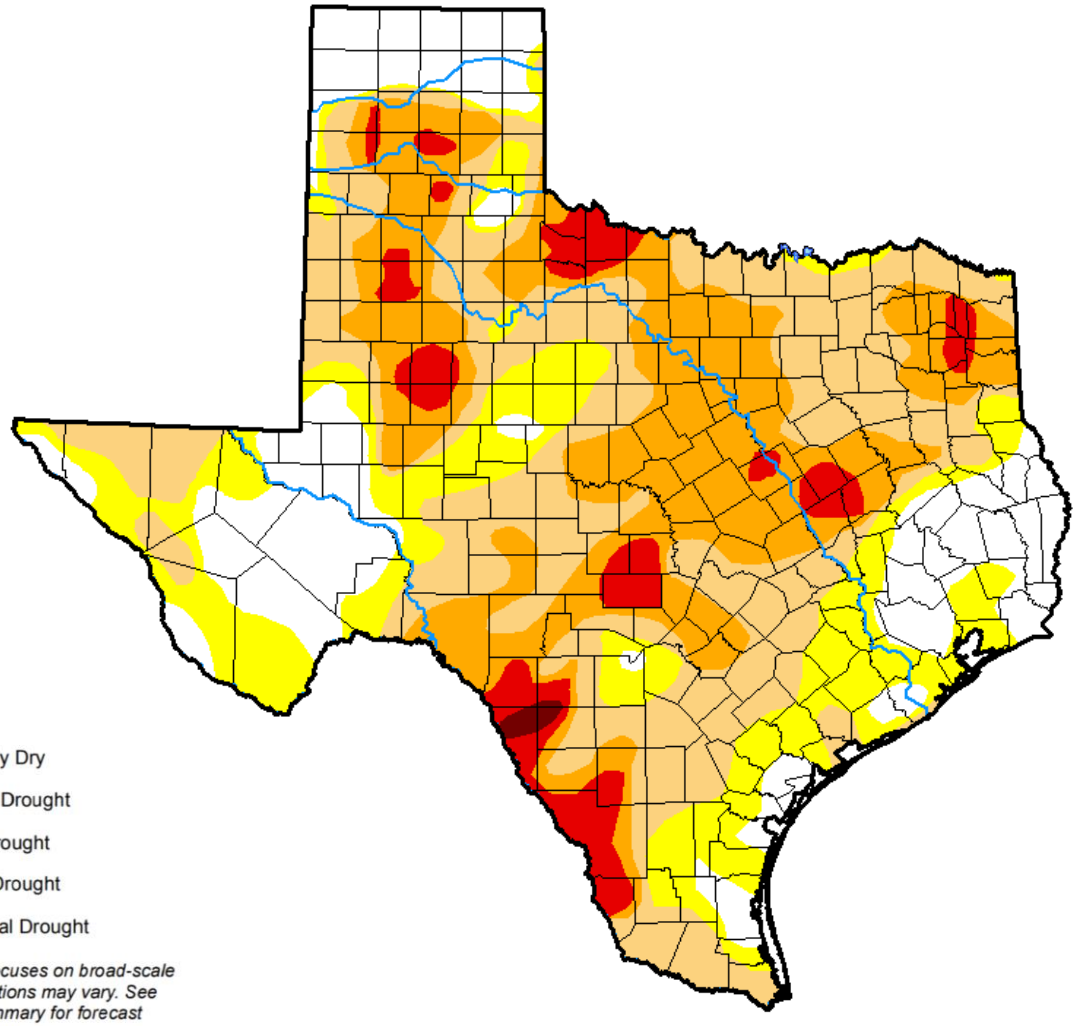


October 4, 2011

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

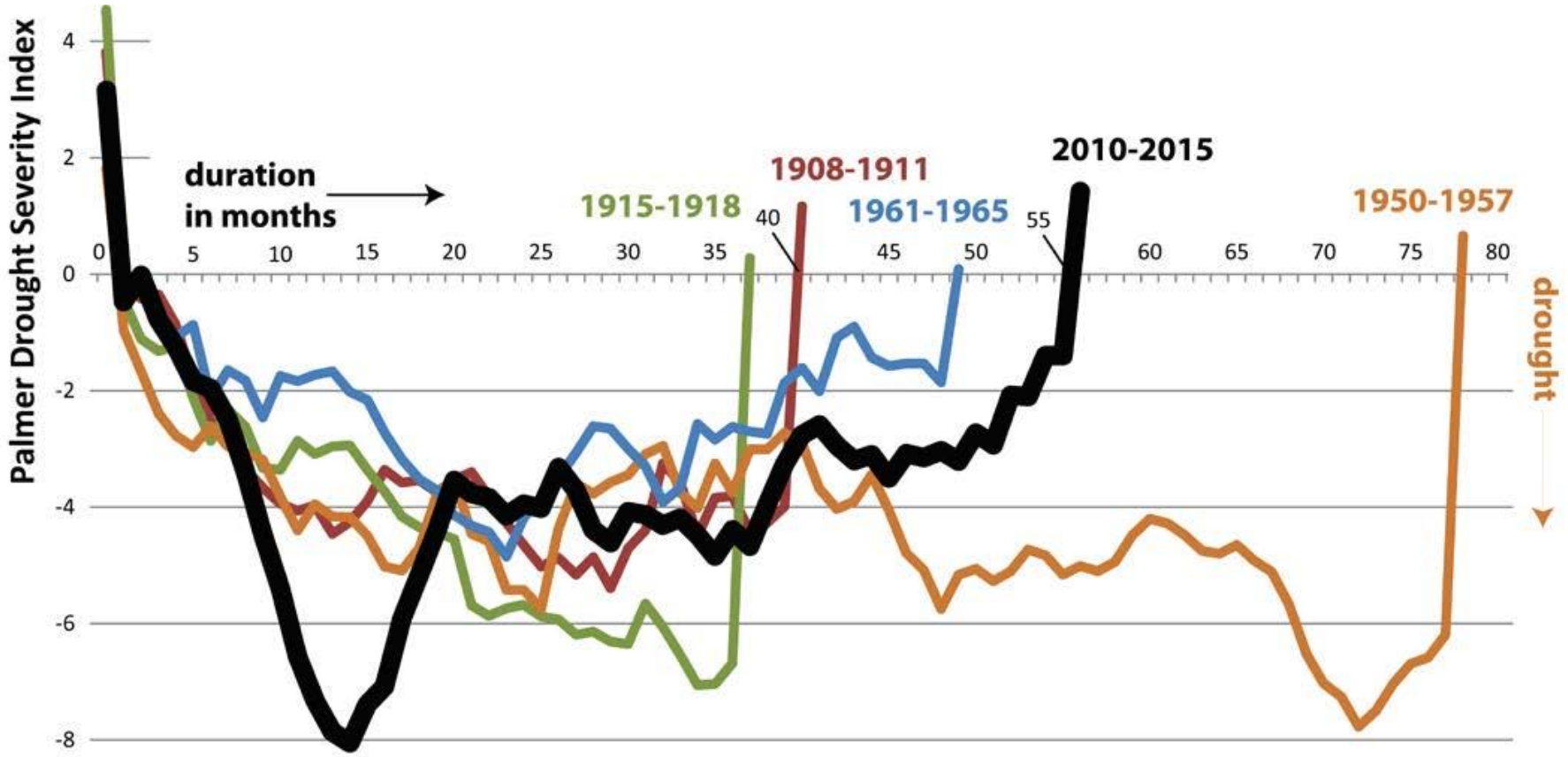


August 28, 2018

5 Worst Droughts in Texas

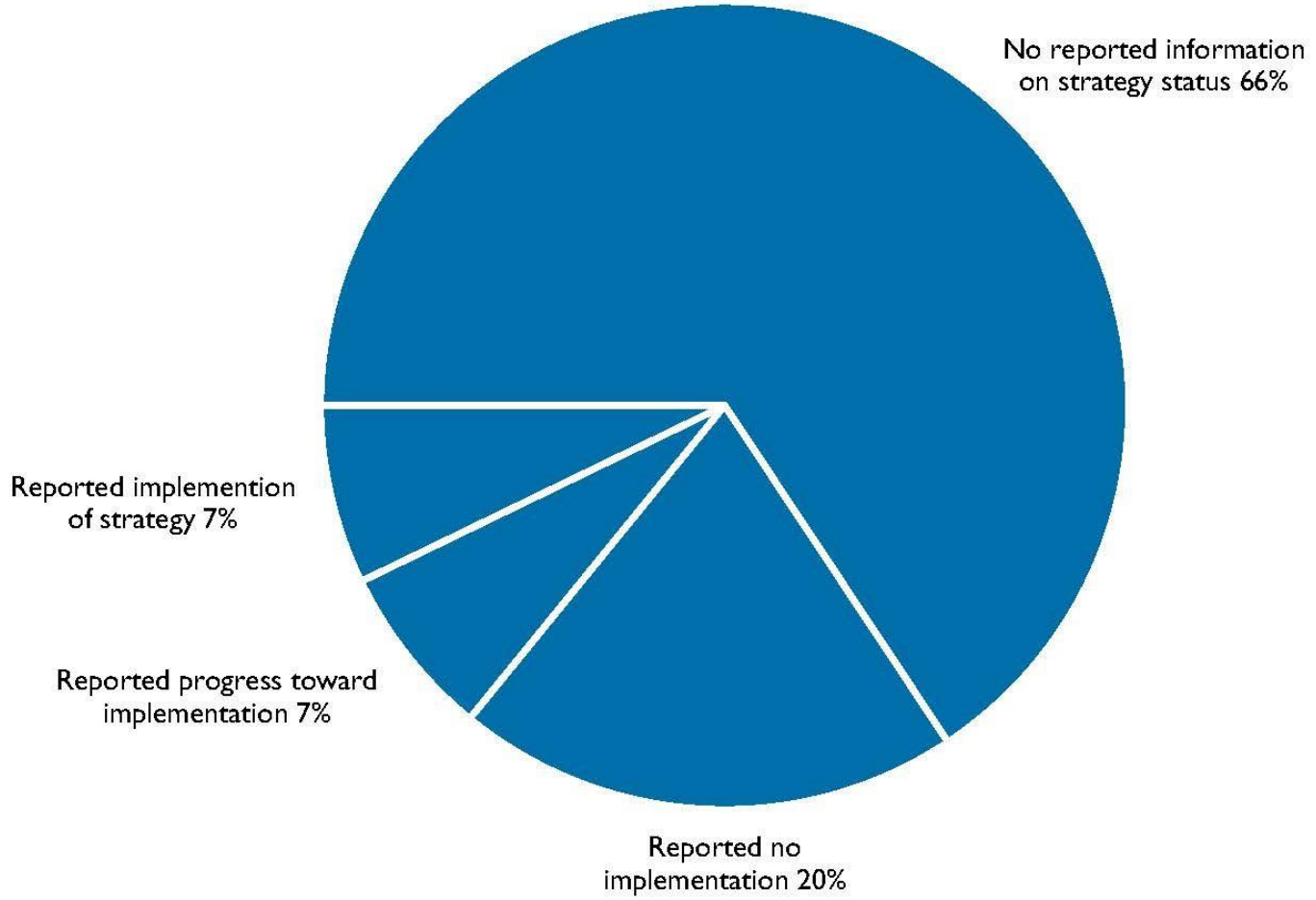
FIVE WORST DROUGHTS

Graph of the five worst state-wide droughts of record (based on a spreadsheet provided by John Nielsen-Gammon, State Climatologist)



State Water Plan | Progress toward Recommended Strategies

Reported implementation of all recommended water management strategies from the 2012 State Water Plan by share of total number of strategies

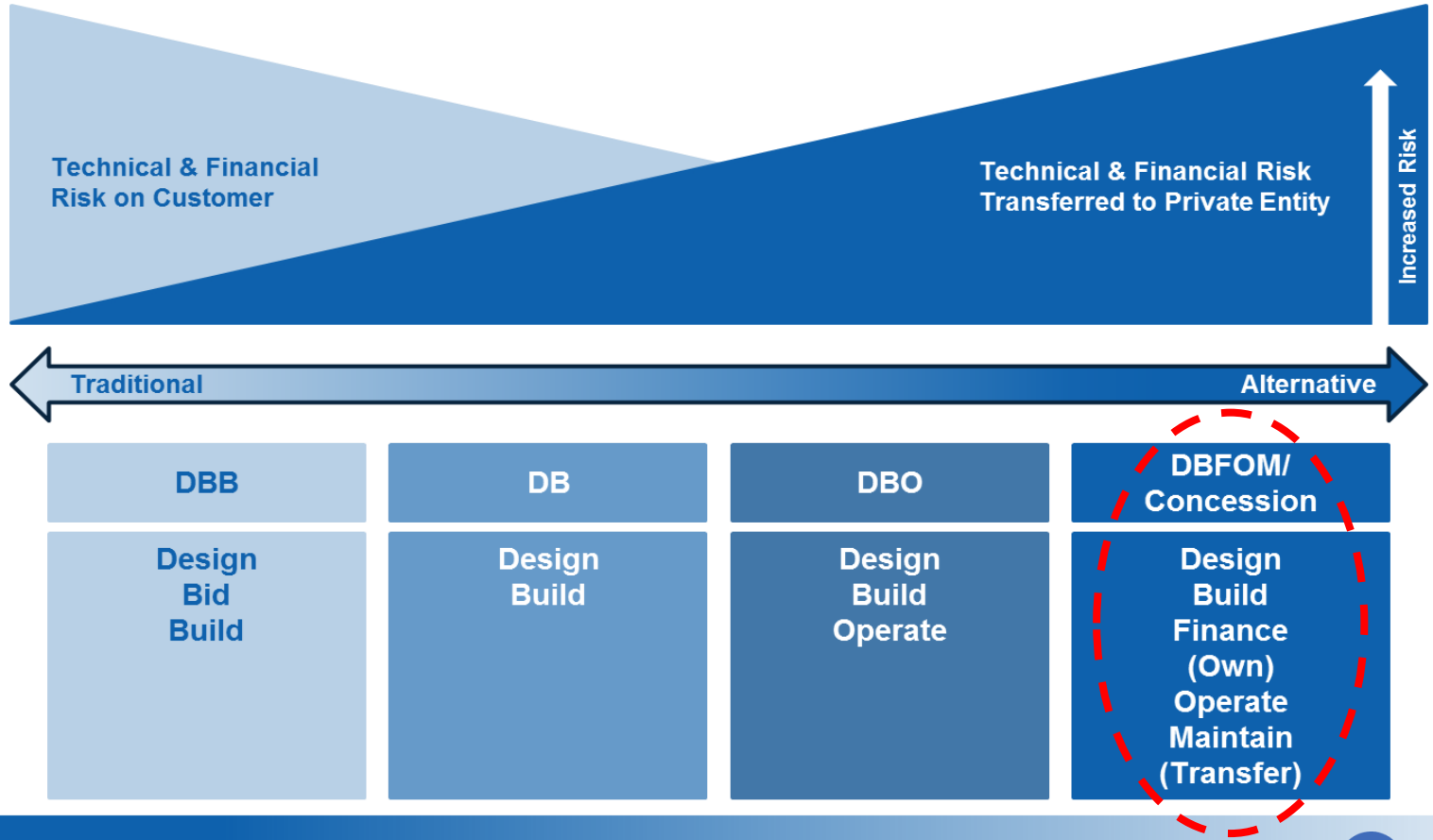


State Water Plan | Implementing Recommended Strategies

- **Traditional project delivery = DBB**
- **Multiple, time-consuming procurement phases**
- **City/Public Agency owns and operates**
- **City/Public Agency exposed to price risk due to change orders and increased operating costs**

What is a P3?

A Public-Private Partnership ("P3") is a method of delivering public infrastructure in which significant risks are transferred to the private sector investor. The public agency retains a high degree of involvement and oversight of the project, and often retains project ownership.



When Does a P3 Make Sense in Water?

Situation	Notes
Risk Transfer	• Where the public agency is more comfortable transferring an unfamiliar technology or other performance risk to the private sector
Underinvestment or Operational Challenges	• Chronic underinvested and deferred maintenance has led to significant upgrade/capital investment needs • Public asset investment is protected long-term because facility condition and performance is guaranteed for a period of 30 to 50 yrs.
Financial Constraint	• Budget or debt limitation or existing liability such as pension obligation, operating deficit, or high utility debt burden
Advanced Schedule	• Where project delivery is needed in a tight timeframe, the private sector can guarantee delivery on a date-certain, fixed-price basis
Regional Project	• Where no regional governance or organization exists or to serve an existing regional agency

Case Studies – Texas Seawater Desalination

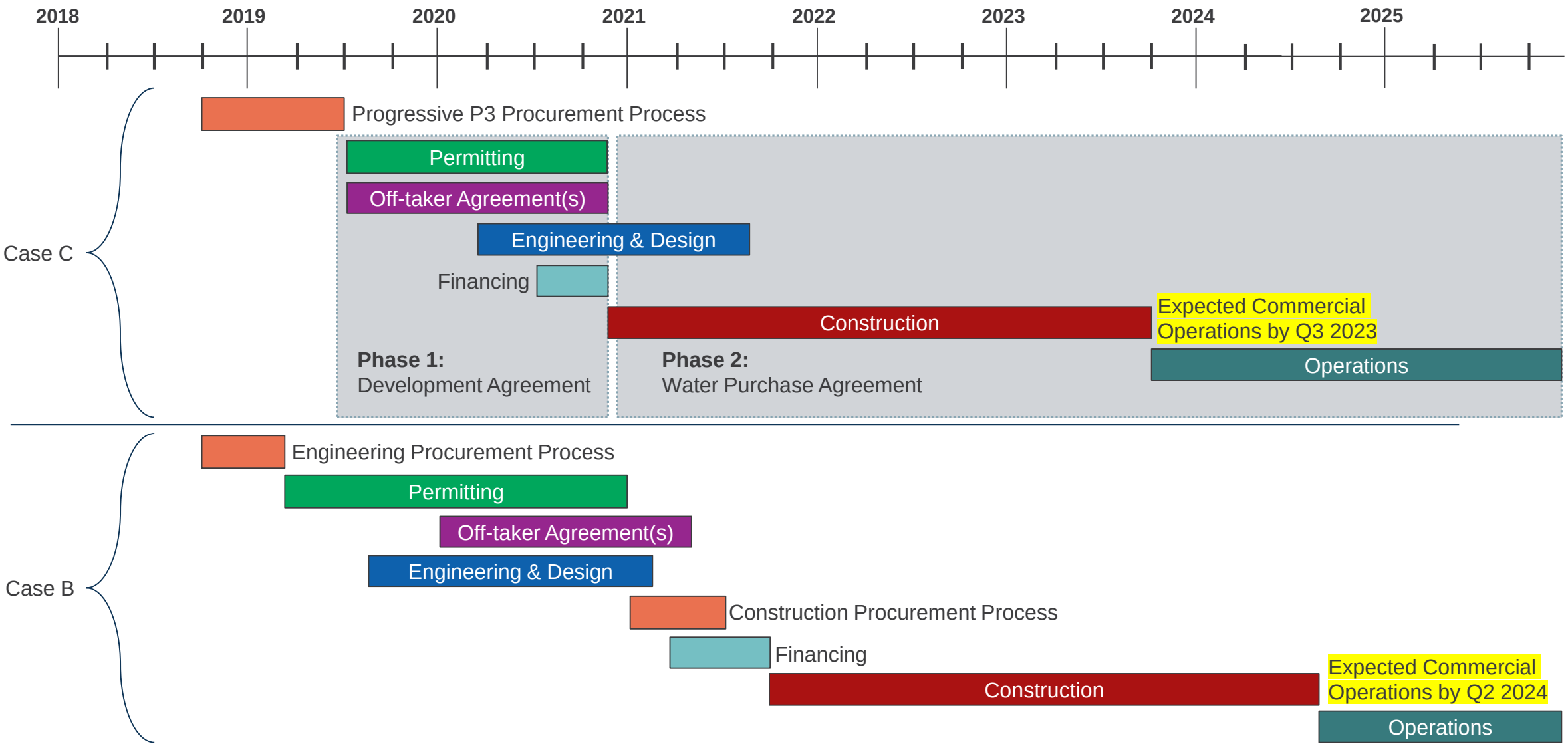
Case Scenarios

- **Let's assume Cases A through C each represent one of Texas' twelve deep water port communities with a significant demand for water to support industrial activities and growth**

Scenario	Description
Case A	• Community A has 500,000 AFY of permitted surface water diversion rights and 200,000 AFY of safe yield which is enough to meet near-term projected demands. They plan to develop additional water supplies in the future as needed
Case B	• Community B decides to build their own seawater desalination plant as a part of their broader water supply diversification strategy
Case C	• Community C decides to select a private partner to deliver a seawater desalination plant under a Progressive P3 model; allows City staff to effectively manage project development and focus on developing other sources of water supply in parallel

Note: a Progressive P3 selects a private partner early in the development process, which further optimizes lifecycle costs and the benefits associated with risk transfer. A Traditional P3, for comparison, would be structured similarly to a Design-Build procurement, but would also include a financing component.

Initial Timelines (Comparable)



Project Delivery | Comparison

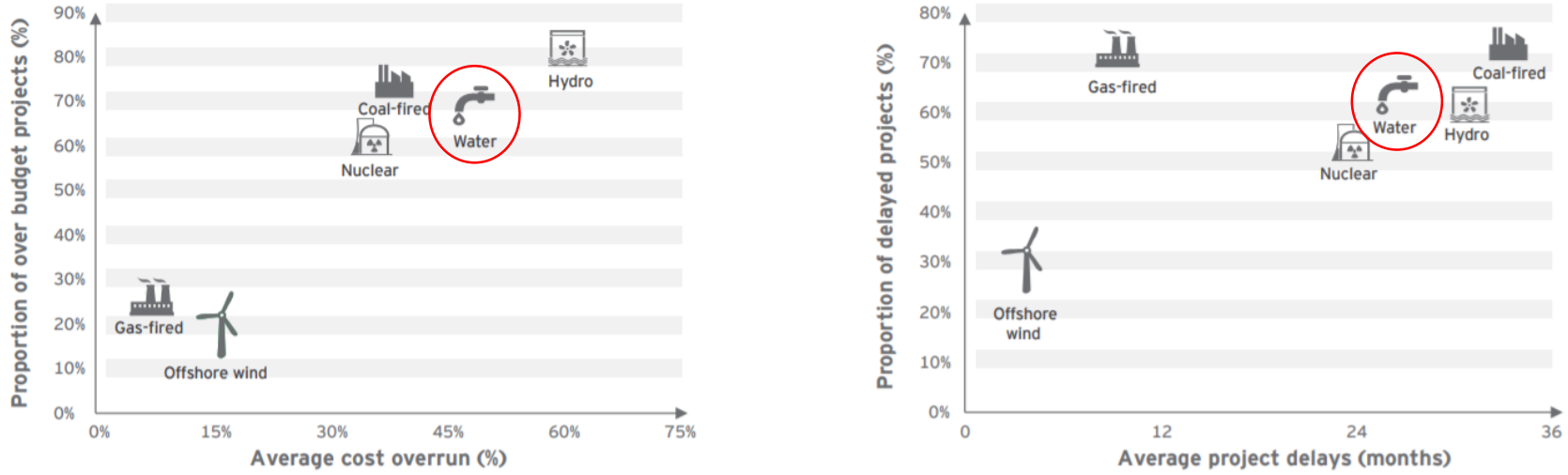
- Key delivery risks: Cost, Schedule, Development, Construction, Regulatory Compliance, and Financing

Case B (Municipally-Financed DBB)	Case C (Progressive P3)
• City responsible for permitting • City incurs debt and pays all O&M costs associated with the Project • City bears full risk of change orders, cost overruns, and schedule delays • Often includes multiple procurement processes and City Council approval requirements • Low tax-exempt interest rate on debt	• Private partner involved early to develop and permit the Project • City pays an agreed-upon water price once the Project delivers water • City not subject to cost overruns • Private partner has strong performance incentive structure and fewer procurement restrictions • Higher weighted average cost of capital

Project Delivery | EPC Risk Management

- **74% of large water infrastructure projects are over budget by an average of 49%[1]**
- **Large infrastructure projects in North America are delayed an average of 33 months prior to start of operations[1]**

Figure 5: Proportion of 100 megaprojects with reported delays and cost overruns



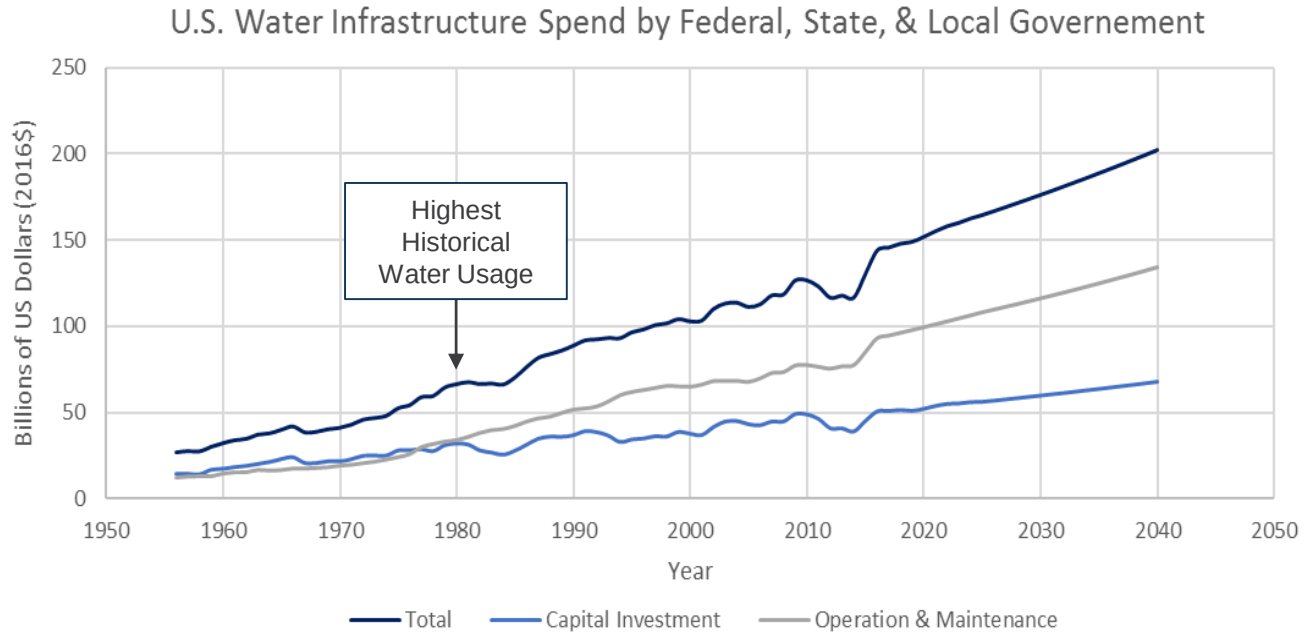
Source: EY research. Other technologies (oil, onshore wind, geothermal, solar and T&D) are not shown as they represent a small fraction of the 100 megaprojects analyzed.

P3 Delivery: Performance Guarantees Locks in Pricing and Schedule

[1] Based on EY research report: "Spotlight on power and utility megaprojects — formulas for success" press release: http://www.ey.com/gl/en/newsroom/news-releases/news-ey-power-and-utility-megaprojects-run-35-percent-over-budget-on-average

Project Delivery | O&M Risk Management

- **Chronic underinvestment and deferred maintenance leads to higher operating costs**
- **O&M costs increase at an average of 3.4% per year in the U.S., excluding inflation, driven in large part by underinvestment (not increased water usage)**
- **This translates into O&M costs that are, on average over a 30-year project, ~69% higher than the first year of operations (constant dollars) – a P3 Agreement, in contrast, could guarantee that O&M costs escalate with inflation**



Based on data from the Congressional Budget Office, American Society of Civil Engineers, and U.S. Geological Survey

How Did the Projects Perform?

Construction	Operations
Case B • Change orders result in Project completed 30% over budget and 12 months behind schedule, which is still *better than average*	**Case B** • Budget cuts and general fund transfers lead to underinvestment in plant maintenance; City B's O&M costs are 45% higher than City C's on average over the life of the Project
Case C • P3 contract guarantees water price and delivery date; City only pays once water is delivered	**Case C** • Performance guarantees ensure a high-quality project and predictable, long-term water pricing

Cost Comparison with Performance Guarantees

- City B: Completed Q2 2025, water is 37% more expensive than expected on a lifecycle cost basis[1]
- City C: Completed Q4 2023 for the price agreed-upon upfront
  - Any cost overruns or delays would be borne by the private partner and would not change the water price
- Including equity in the financing for Case C:
  1. Allows for significant risk transfer
  2. Creates a strong performance incentive structure for the private partner
  3. Avoids the significant cost overruns and delays that occurred in Case B
  4. Results in a lower overall lifecycle cost of water

- Both Cities B and C can take advantage of Senate Bill 1430 to market some of their surface water upstream to offset some of the costs of the desalinated water
  - SB 1430 streamlines and expedites the permitting process to market water upstream within a river basin

Scenario Outcomes

- **Where does that leave us if Texas has another drought-of-record by 2025?**

Scenario	Description
Case A	• City A did not have as much water as it thought it had on paper • Forced to impose severe curtailments and usage restrictions • Loses 2 prospective, multi-billion dollar industrial contracts and an existing industrial customer closes a facility • Existing industries reduce production and a number of residents decide to relocate, both of which decrease City A's tax base for the foreseeable future
Case B	• City B has enough water to meet current demand • Attracts one new major industrial customer
Case C	• Multiple new water supplies creates a lower blended cost of water • Attracts several of the largest industrial customers which significantly bolsters their economy and tax base, and leads to population growth

Takeaways

- This is a hypothetical scenario, but what is the point?

1. Industrial growth along the Texas Coast needs three things: natural gas, skilled labor, and water
2. During a drought is not the time to decide to build a seawater desalination facility
3. P3s work because the various project risks are allocated to experts who are able and incentivized to guarantee performance
4. Your next source of water will always be more expensive than your last, but not as expensive as running out of water entirely and the severe consequences that go along with that

Questions?

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