

Once Through Cooling Study (OTC) Update

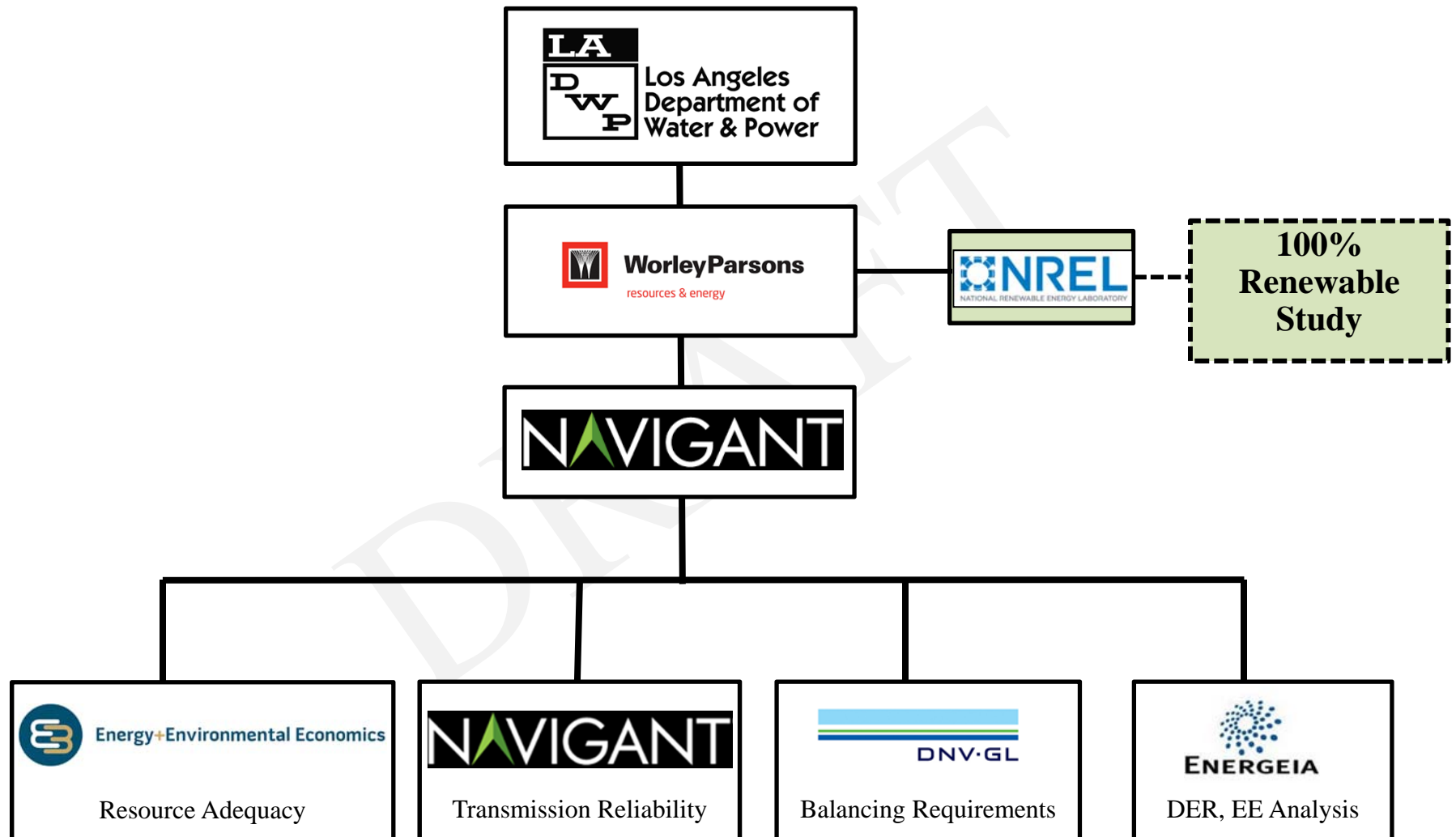
Third Party Engineering Assessment
Draft

Putting Customers First   

Objectives / Goals

- Independent, third-party evaluation of potential scenarios and select alternatives to modernizing once-through-cooling (OTC) units
 - Scenarios: Various OTC retirement combinations
 - Alternatives include: renewables, energy storage, EE, DER, transmission, reduced repowering, & other viable options
- Develop recommendations

Consulting Team



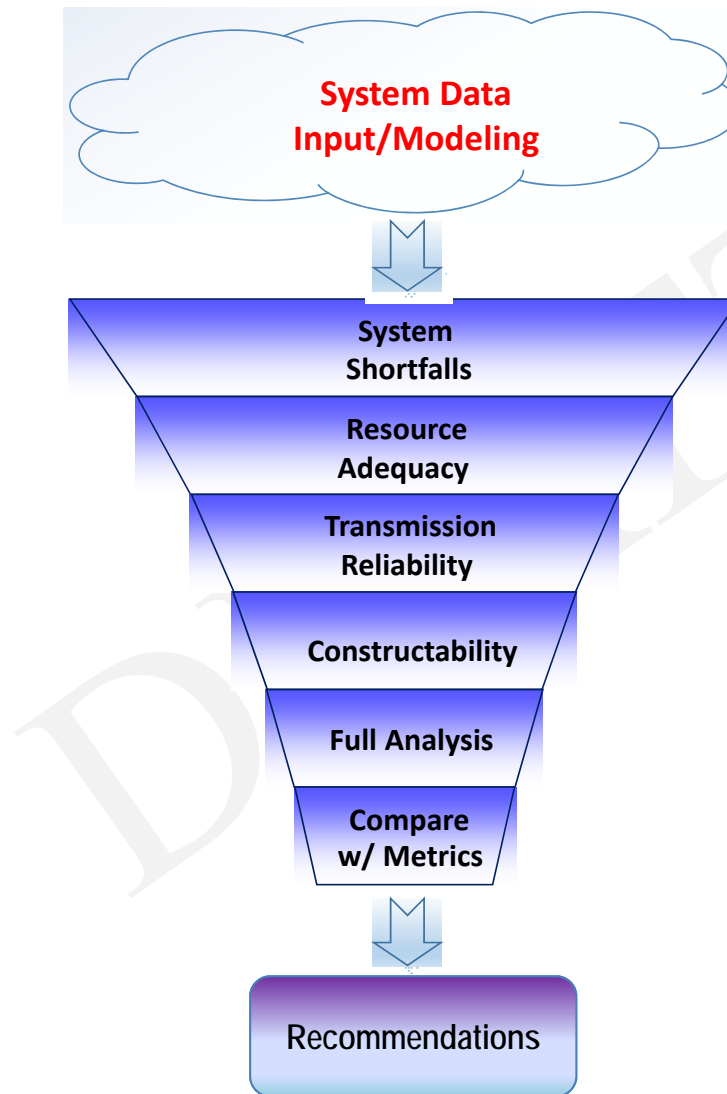
Scenarios

Scattergood	Haynes	Harbor
Retire – 2024	Retire – 2029	Retire - 2029
Retire – 2024	Repower	Repower
Retire – 2024	Repower	Retire - 2029
Retire – 2024	Retire – 2029	Repower
Repower	Retire – 2029	Retire - 2029
Repower	Repower	Repower
Repower	Repower	Retire - 2029
Repower	Retire – 2029	Repower

Alternatives

Renewable Energy Only (RE)
Energy Storage Only (ES)
Distributed Energy Resources (DER)/Energy Efficiency (EE)
RE/ES Only
Transmission Improvements only (Tx)
Tx/ES only
Ts/ES/RE
Tx/ES/RE/DER/EE
Partial Repower + Alternatives

Study Filters



Scenario/Alternative Matrix

Scenarios and Alternatives	Retirement Scenarios		All Repowered Baseline	All Retired	Scattergood Retired Scenario	Haynes Retired Scenario	Harbor Retired Scenario	Haynes & Harbor Retired Scenario	Scattergood & Haynes Retired Scenario	Scattergood & Harbor Retired Scenario
			All Repowered Baseline	None Repowered	Haynes & Harbor Repowered	Scattergood & Harbor Repowered	Scattergood & Haynes Repowered	Scattergood Repowered	Harbor Repowered	Haynes Repowered
	Mitigation Alternatives		A	B	C	D	E	F	G	H
No Repower Options	1	Renewable Energy (RE) Only	n/a							
	2	Energy Storage (ES) Only	n/a							
	3	Distributed Energy Resources (DER), EE Only	n/a							
	4	Renewable Energy, Storage	n/a							
	5	Transmission Improvement (Tx) Only	n/a							
	6	Tx, ES	n/a							
	7	Tx, ES, RE	n/a							
	8	Tx, ES, RE, DER, EE	n/a							
Partial Repowering	9	Repowering OTC Units with Requisite Capacity (ReqCap)	n/a							
	10	ReqCap, ES	n/a							
	11	ReqCap, Tx, ES, RE	n/a							
	12	ReqCap, Tx, ES, RE, DER, EE	n/a							
	13	ReqCap, DER, EE	n/a							
Full Repowering	14	Re-powering OTC units as Planned	Baseline	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Study Status

- Gather System data - **Completed**
- Develop system model – **Completed**
- Model validation – **Completed**
- Perform Study - **Ongoing**
 - RMR Transmission analysis
 - Resource Adequacy Analysis
 - Loss of Load Expectation Analysis
 - Balancing Area Assessment
- Summarize results – **Ongoing**
- Assess alternatives – **Ongoing**
- Stakeholder Outreach – **July/Aug 2018**

QUESTIONS?

DRAFT