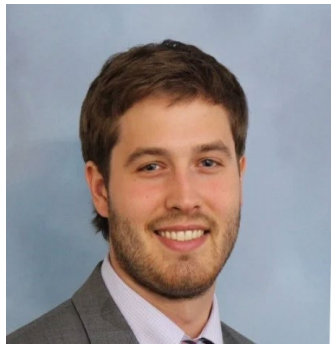
BURNS McDONNELL®

EMERGING LEADERS FORUM

Agenda

- Introductions
- Grid Mod History
- Lessons Learned
- Stage Gate Process
- Digital Estimation - Powercompass

Introductions



DANIEL MILLER
Electrical Engineer
Burns & McDonnell

Caroline Vaughan
Sr. Project Manager
Entergy

SANTOSH BHADULE
Section Manager - Technology
1898 & Co. part of Burns & McDonnell

Mylan Perrin
Grid Modernization Engineer
Entergy

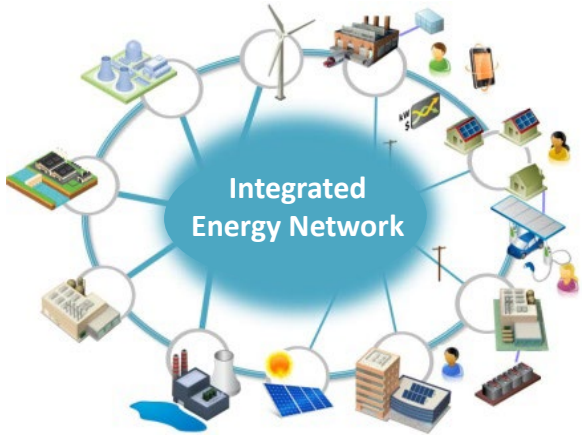
Utility Strategy: Grow, Modernize and Transform

Same business model… an evolving operating model

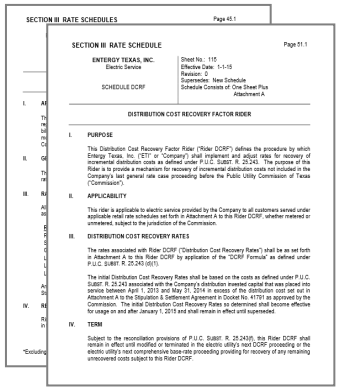
Grow our utility business…

- Investment opportunities for the benefit of our customers
- Develop innovative products and services
- Execute modernizing and transformative projects
- Regulatory engagement and regulatory constructs

In a customer-facing manner…



That creates a more robust and modernized grid…



With regulatory support for effective recovery

Entergy's Opportunity to Grid Modernization

Evolving Customer Demands

The needs and preferences of electric customers across the county, including Entergy's, are evolving to place greater emphasis on hyper-reliability, access to information, local sustainable generation, greater energy efficiency, etc.

Aged Assets & Systems

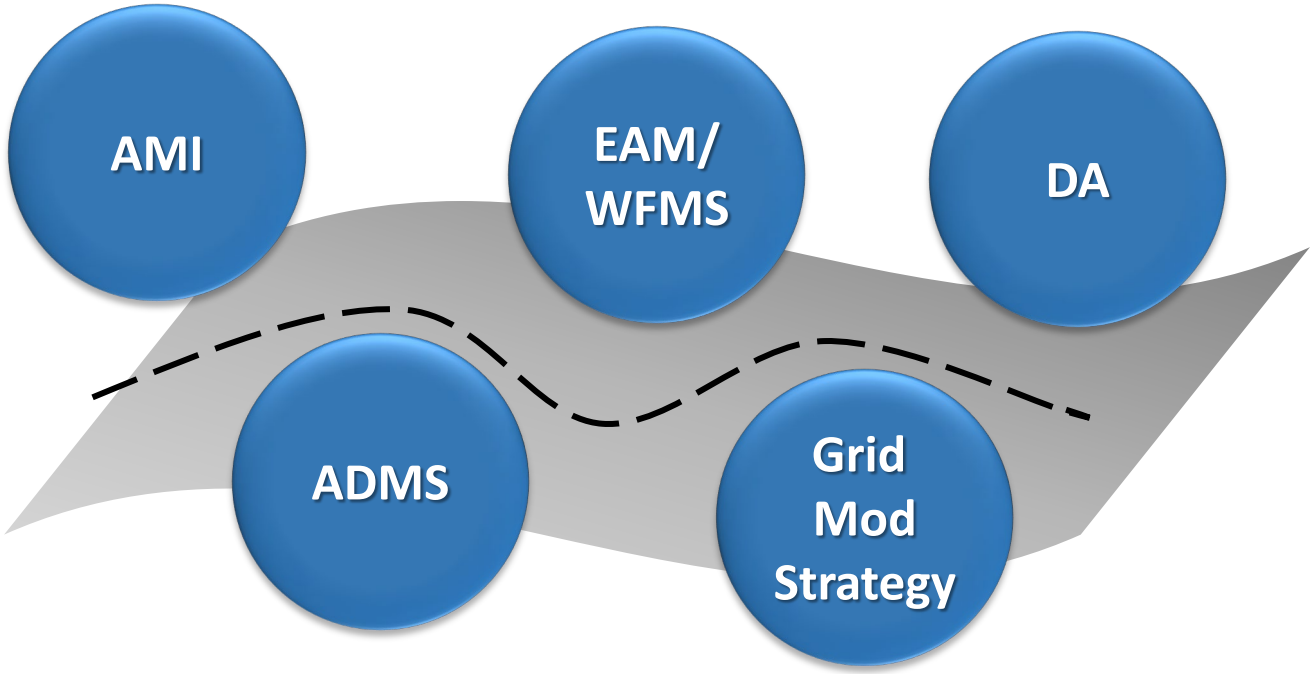
For Entergy to meet these evolving customer needs, we must address the aging asset fleet with enhanced asset health awareness and renewal investment.

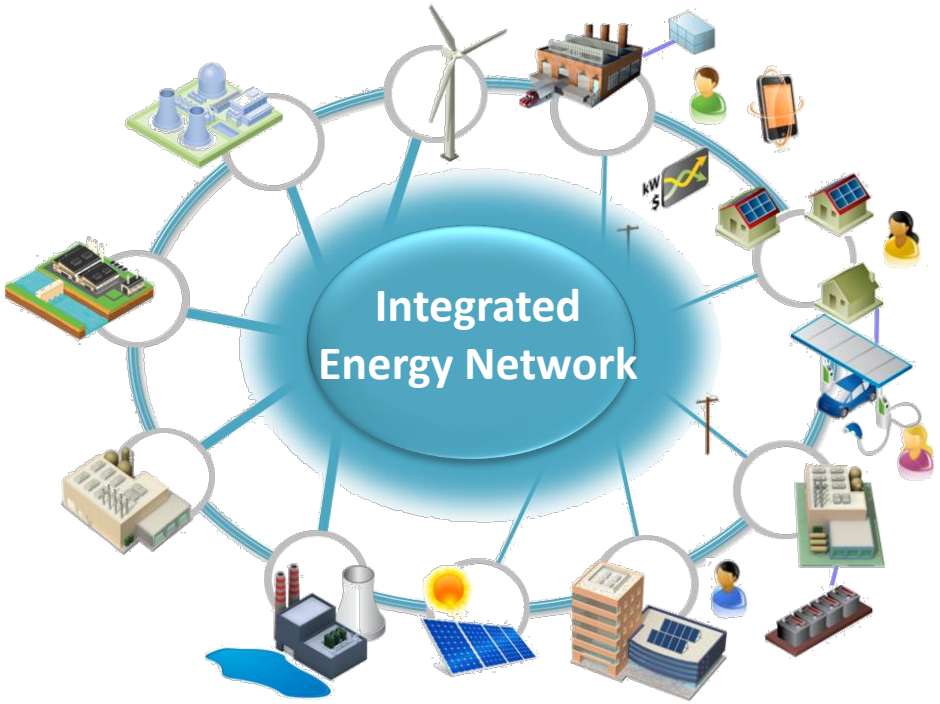
New Technologies

In addition to addressing asset age and health, new technologies are now mature and available to help meet these customer needs and further reduction in risk exposure, increase operational efficiencies and enable new products and services.

Grid Modernization

Entergy's journey to Grid Modernization





- New technologies and systems
- Modernization of assets
- Devices and sensors for grid intelligence

Grid Modernization Engineering Study (GMES)

Partnered with Burns and McDonnell (2015)

Objectives of Grid Study

Translate thesis into specific, prioritized projects to pursue

- Evaluate representative set of assets for potential projects
- Prioritize based on benefits
- Develop detailed scope of work, including expected capital budget
- Draw a line on the sand Grid Mod Standards

Link projects to specific quantified benefits, including:

- O&M savings; operational excellence
- Reliability (SAIDI/SAIFI) improvement
- Fuel consumption optimization
- Enablement of future technologies

Support internal approvals packaging and regulatory filings, as needed

- Robust plan & benefits case to build internal approvals package
- Support development of regulatory strategy by OpCo

Grid Study Deliverables

Phase I: Define Engineering Standards, identify representative circuits, and complete pilot analytics

Phase II: Perform circuit level Engineering analysis across identified representative circuits, synthesize results into prioritized, and state executable plan

Phase III: Support regulatory and internal approvals and institutionalize process and tools

Setting Standards for the Future

Drawing a line in the sand to make a change for the future

Simplified Materials

- Greater buying power
- Ease of installation
- Consistency across Entergy system

Distribution Automation

- Communication and visibility to field equipment
- Faster restoration times
- Minimize customer exposure
- Utilize new technology for future **IRP** use cases

Legacy Guidance

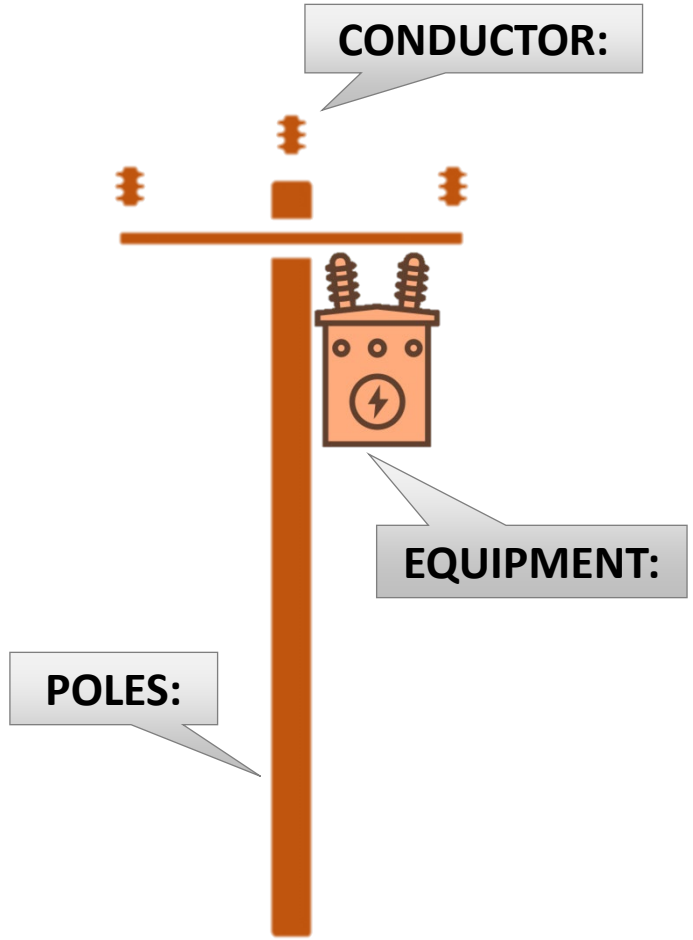
- Set a point of no return to require rebuild to new standard
- Simplified maintain vs upgrade criteria

2 Way Power Flow

- Increased line capacity by lowering conductor rating guidelines
- Enabling self-heling networks
- Support distributed generation and dynamic switching

Line Routing

- Establish best practices to minimize vegetation and back lot maintenance
- Single circuit construction
- No transmission under build



Develop Projects and Refined Business Cases

Grid Modernization Strategy


Build to Serve


Targeted & Strategic Projects

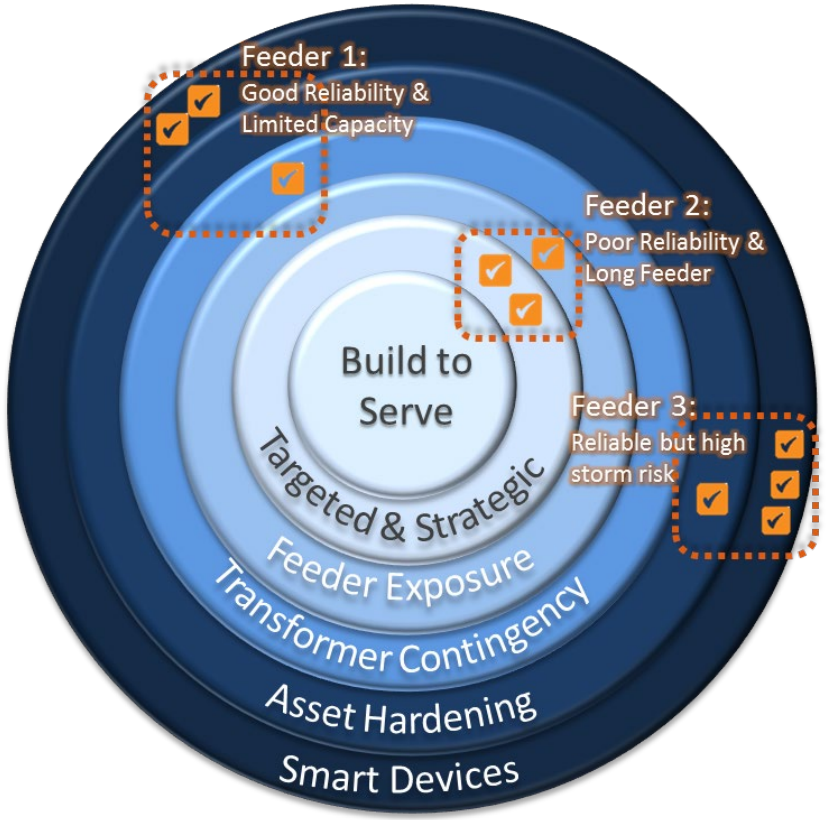

Transformer Contingency


Feeder Exposure


Asset Hardening


Smart Devices

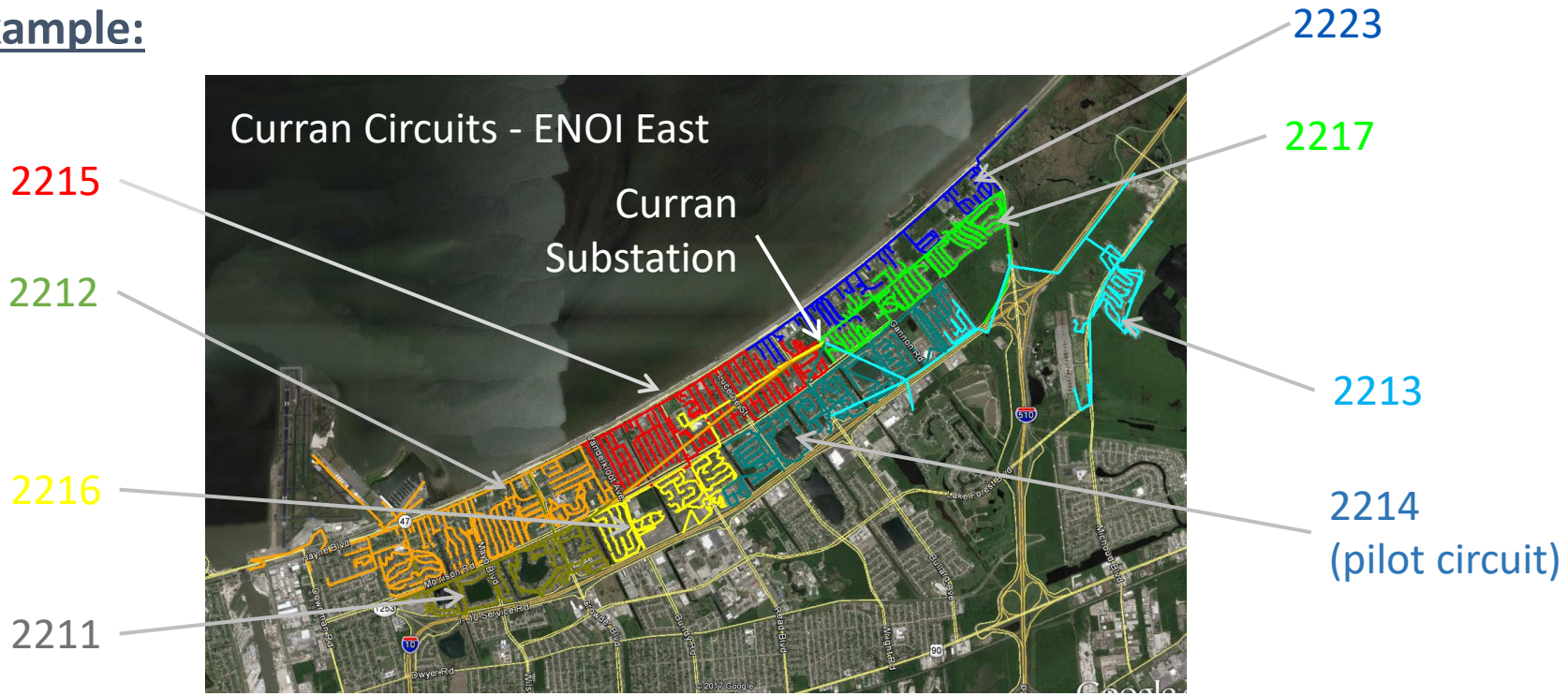
Grid Study



What is a Guild?

Guild= Group/ family of circuits that are in a close proximity geographically and/or share switchable connections with each other. They work together to serve a geographical group of customers.

Example:

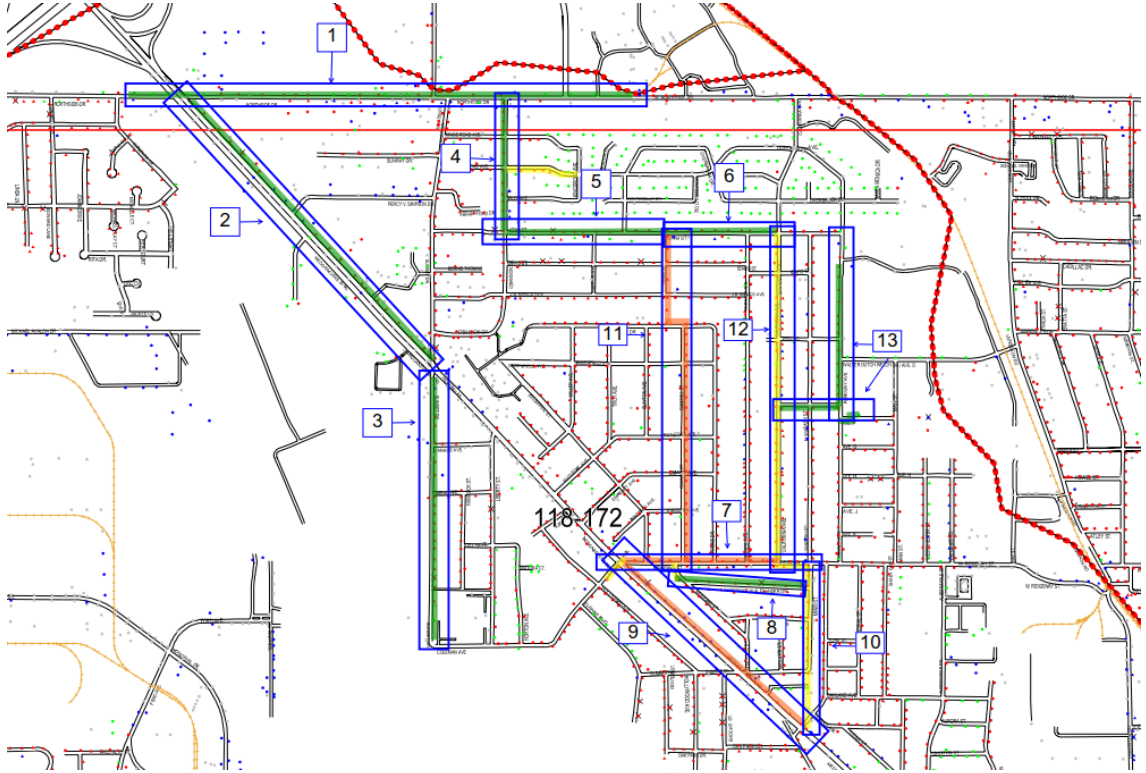


*…One **Holistic Project** for each **Circuit Family***

Guild Pilot Program- Execution

Lesson's Learned- The need of a Stage Gate Process

Benefits



Miami St- First Executed Guild

Lesson's Learned

- Project refinement… the how to build those projects → **DPD**
- Large capital project organization to execute these projects → **DPME&C**
- A formalized process and governance to drive consistency and certainty throughout the life cycle of each project → **SGP**

What is the Stage Gate Process?

Overview

The Stage Gate Process (SGP) is the primary ***process*** used for the ***execution of Distribution projects*** within DPM&C.

- It is a project delivery system that drives ***consistency*** and ***certainty*** in project deliverables, activities and outcomes.

Purpose

To standardize the ***planning, preparation, and execution*** of Distribution projects in DPM&C and provide project teams with the necessary deliverable requirements and activities that must be performed throughout a project's lifecycle.

- In addition to providing guidance and structure, it highlights how a project transitions from one stage to the next between different project stakeholders.

What Does It Look Like?

The SGP is an eight-stage project delivery system – which goes from project initiation through closeout – listing specific deliverables and activities that should be accomplished at each stage across standard Project Management components:

- Segmentation, Project Plans, GOES, Scheduling, Estimating & Cost Control, Risk Management, WBS, Scope & Change, Reporting, Procurement & Contracting, Engineering, Construction, Start-up & Operations, ROW / Environmental

Stage 1 – Business Case Justification

Objective
- To determine the feasibility of the project options and select the option that best addresses the need.

Responsible Stakeholder Group
- Distribution Asset Planning

Deliverables/Requirement List
- Class 5 Cost Estimate*
- Scope Map*
- Business Risks*
- Target ISD Date*
- Segmentation Matrix
- Project Business Case*
- GOES Template
- Peer Review
- Portfolio Log

*Signifies deliverables or requirements that are updated or adjusted based on development of the scope and project progression.

Stage 2 – Project Scope Refinement

Objective
- To refine the scope of the option that best achieves the business need.

Responsible Stakeholder Group
- Distribution Project Development

Deliverables/Requirement List
- Class 4 Cost Estimate*
- WO Breakdown
- Scope Map*
- Project Scoping Plan
- Initial FP requests for Stage 3 funds
- Preliminary Site
- Engineering Review
- Level 1 Schedule (Target ISD Date)
- Long lead Item Risks
- ROW/Vegetation Risks
- Environmental/Permitting Risks
- Segmentation Matrix*
- Project Business Case*
- GOES Template*
- Peer Review
- Portfolio Log

*Signifies deliverables or requirements that are updated or adjusted based on development of the scope and project progression.

Entergy Estimating Software Tool

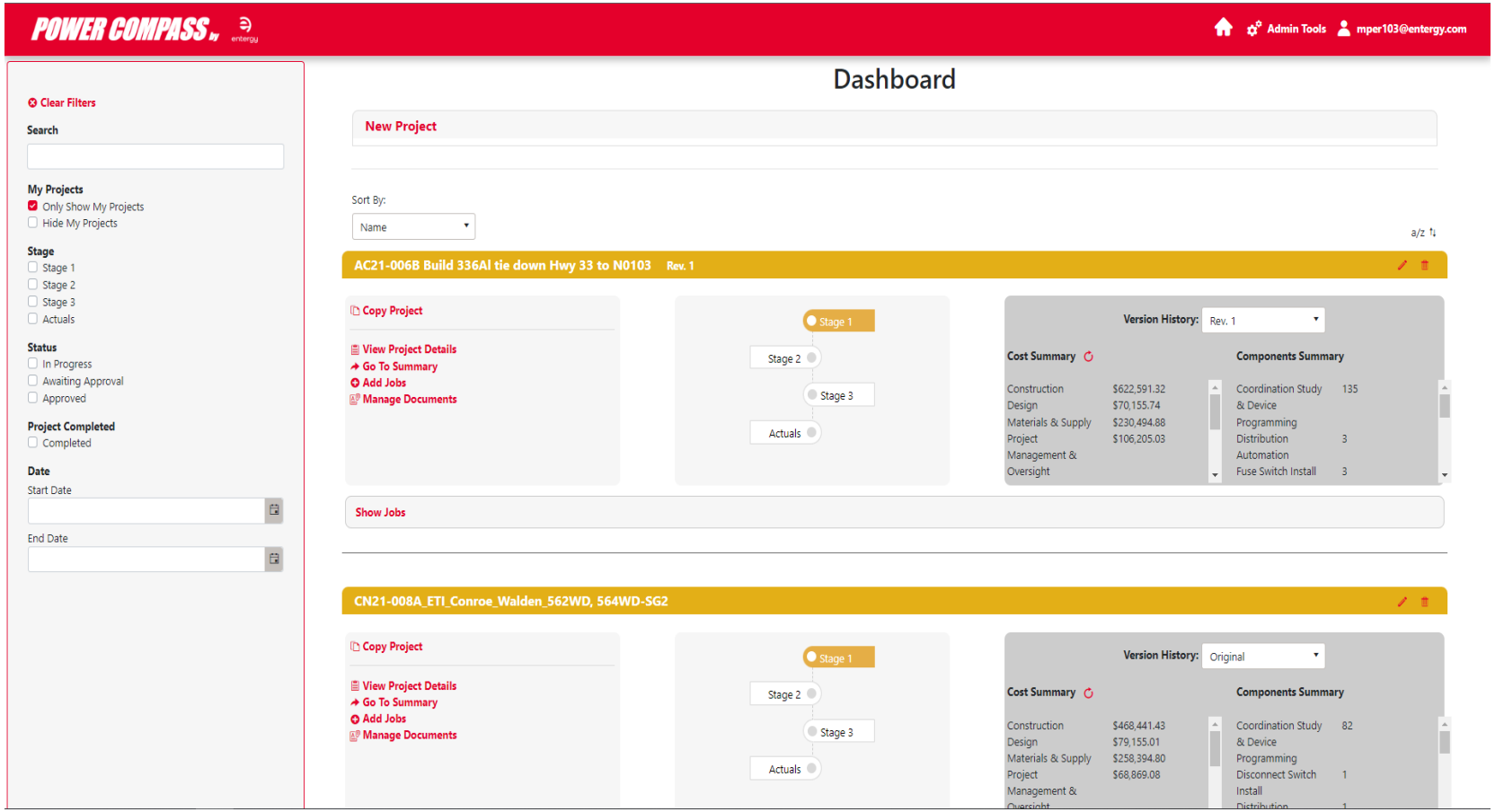
Mylan Perrin

Santosh Bhadule

Entergy Estimating Software Tool

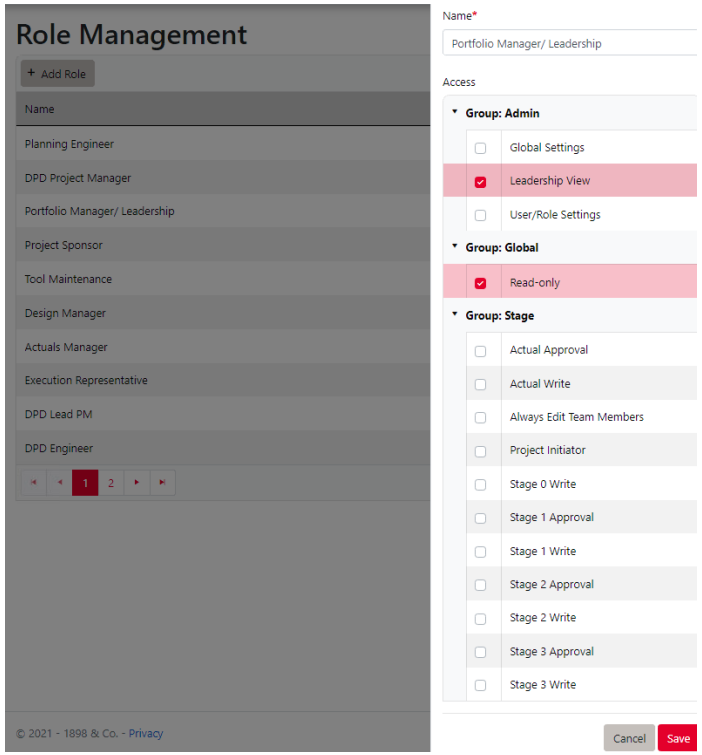
MAJOR COMPONENTS

- Configuration and Setup
- Estimation
- Leadership view & Analysis
- Resource Allocation
- Cash flow



Entergy Estimating Software Tool

CONFIGURATION / SETUP | GENERIC | ONE TIME SETUP | ROLES AND PERMISSION



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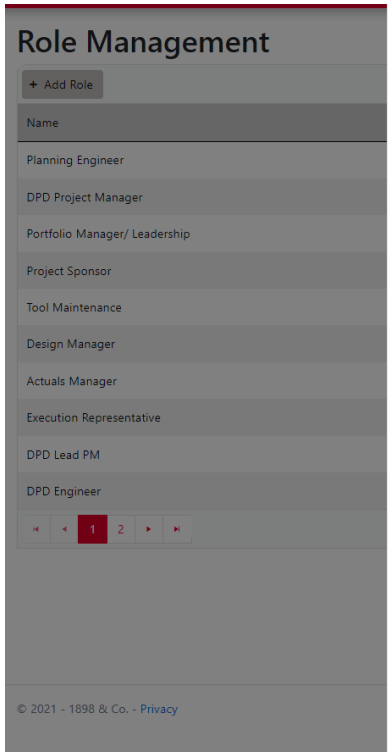
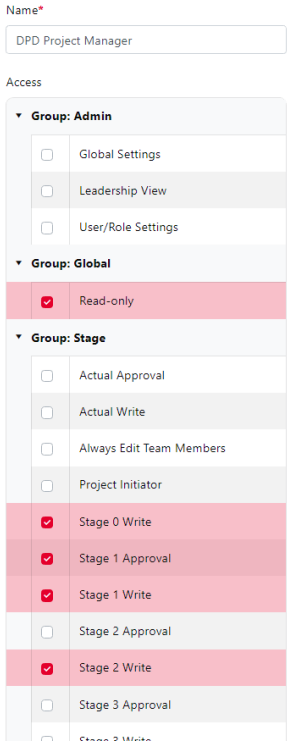
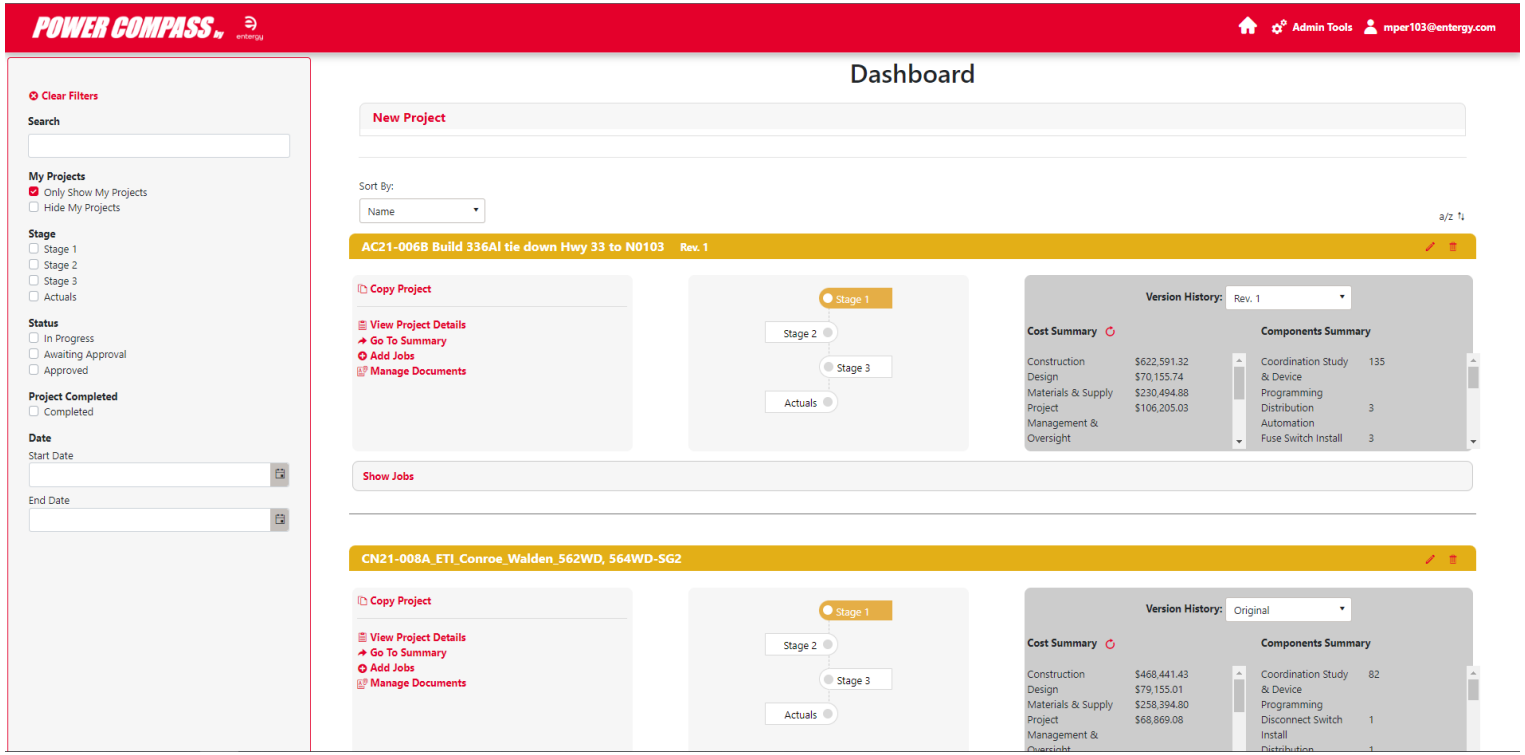
CONFIGURATION / SETUP | GENERIC | **ONE TIME SETUP** | ROLES AND PERMISSION







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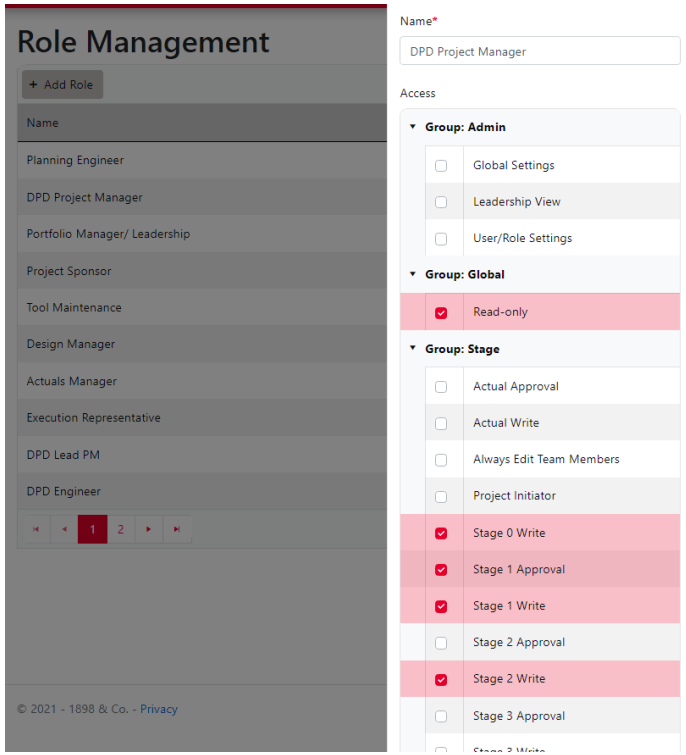
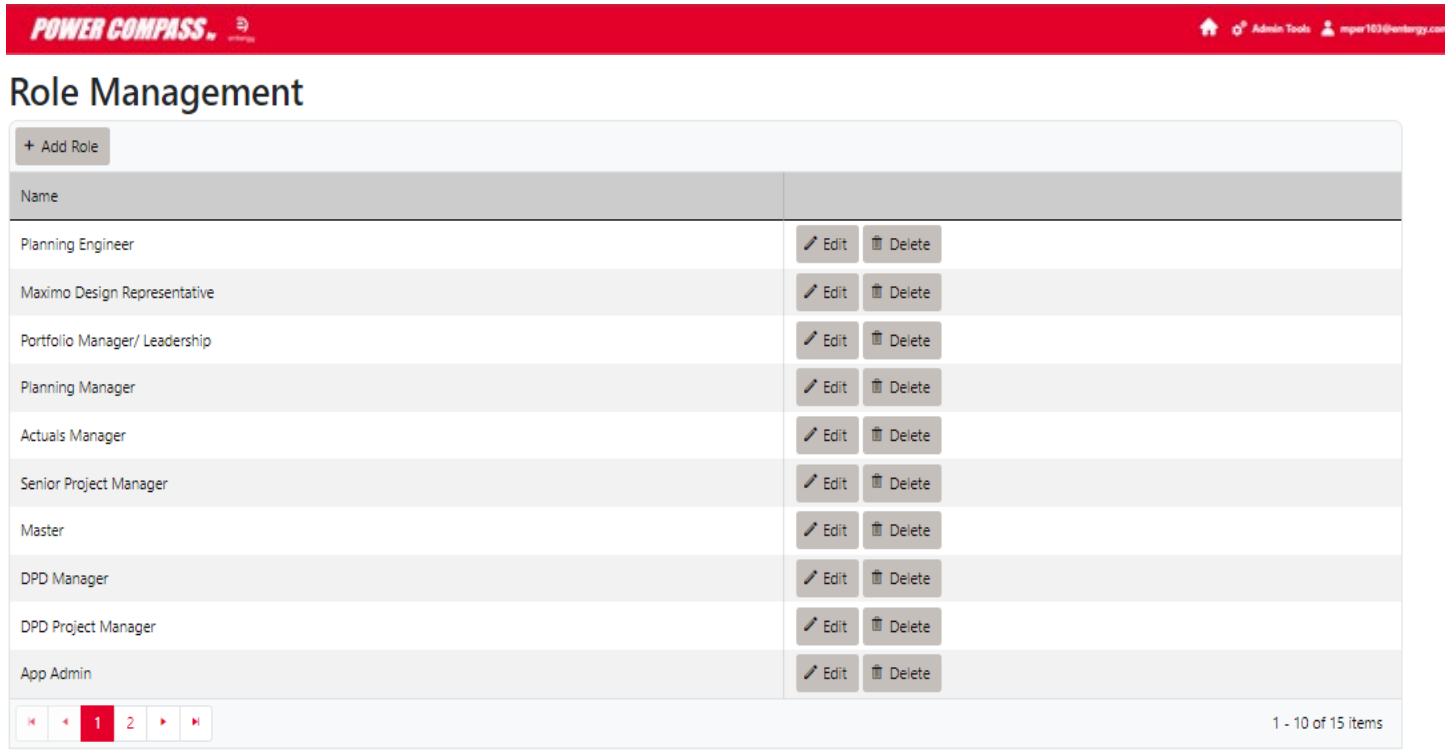
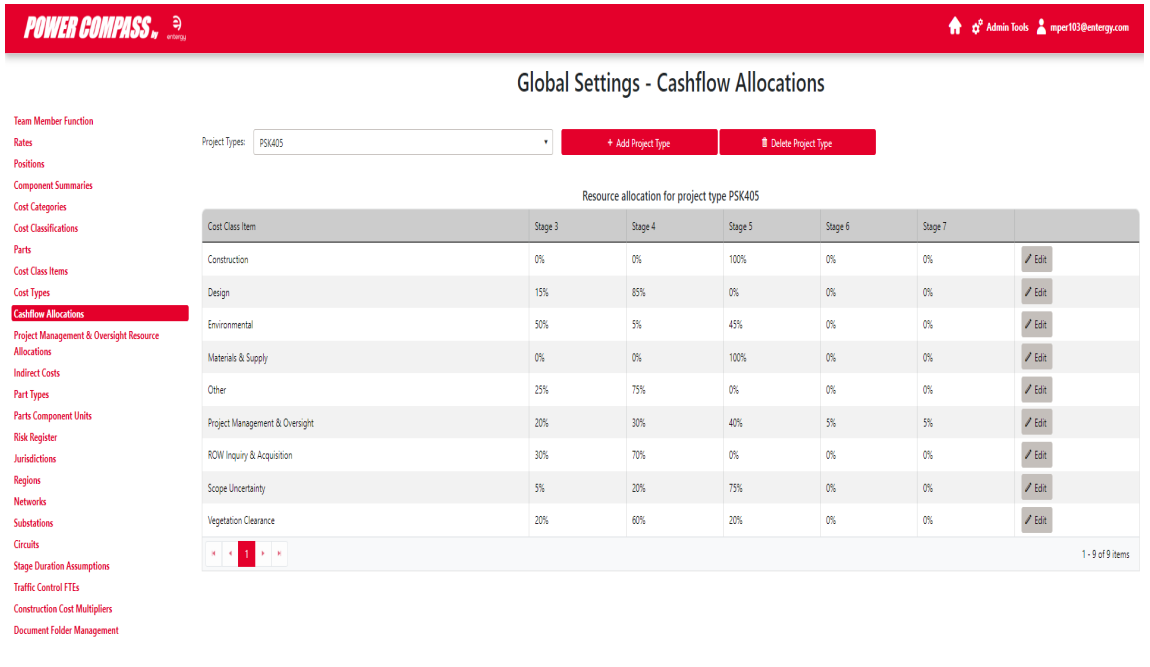
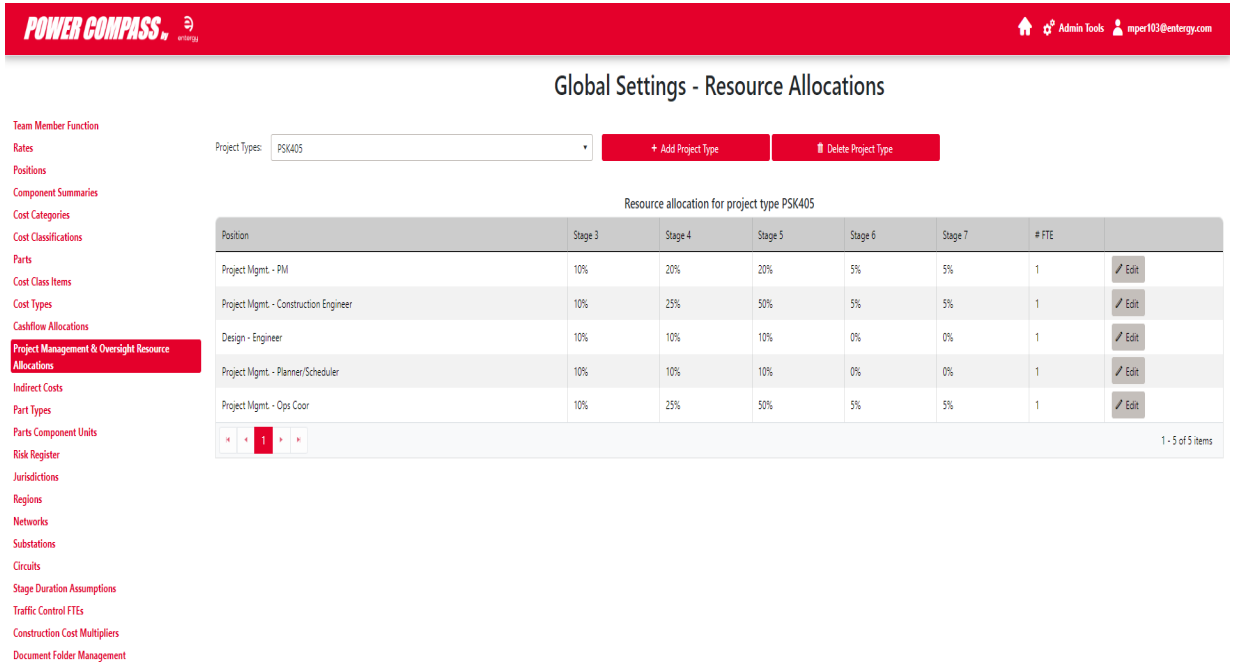




Entergy Estimating Software Tool

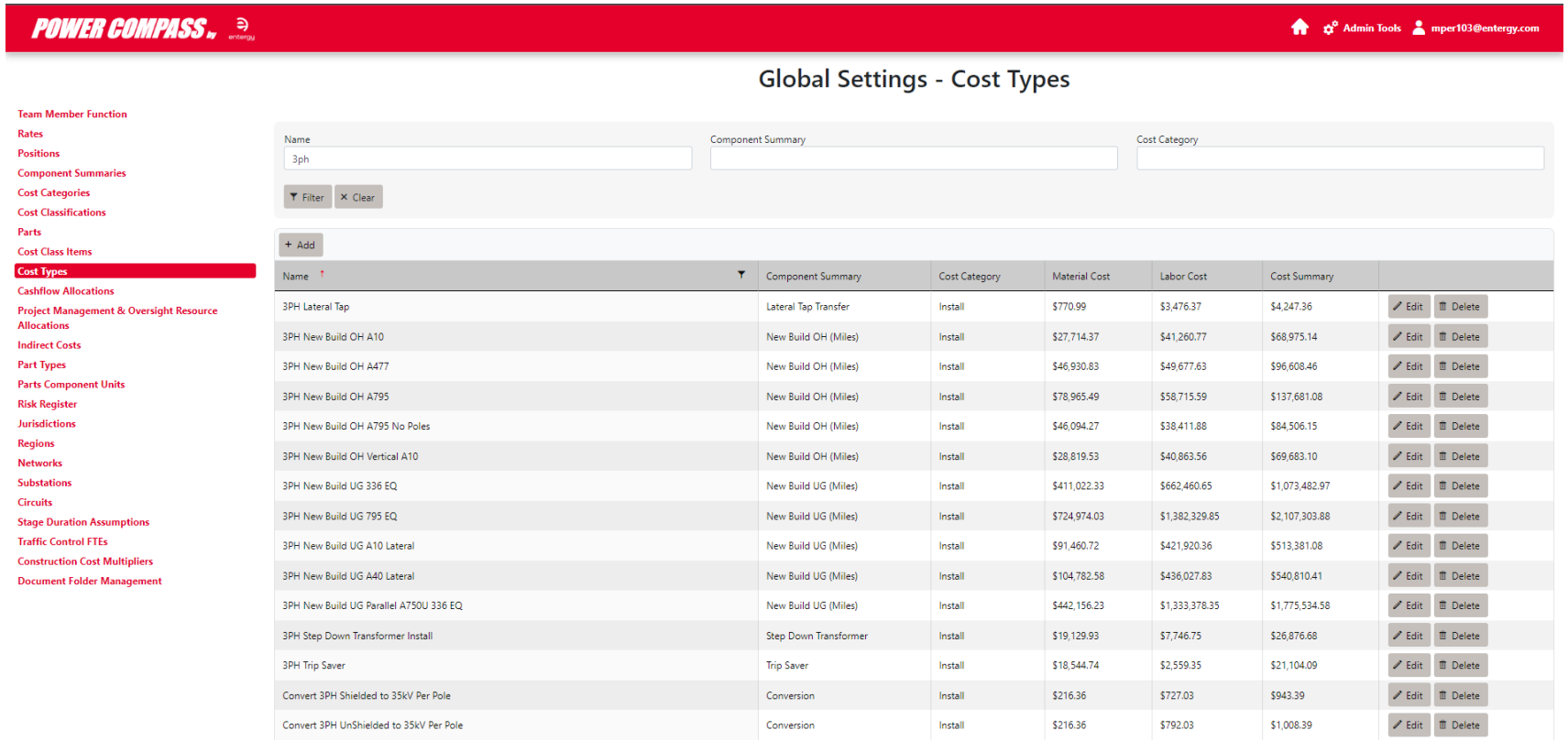
CONFIGURATION, NOT CUSTOMIZATION





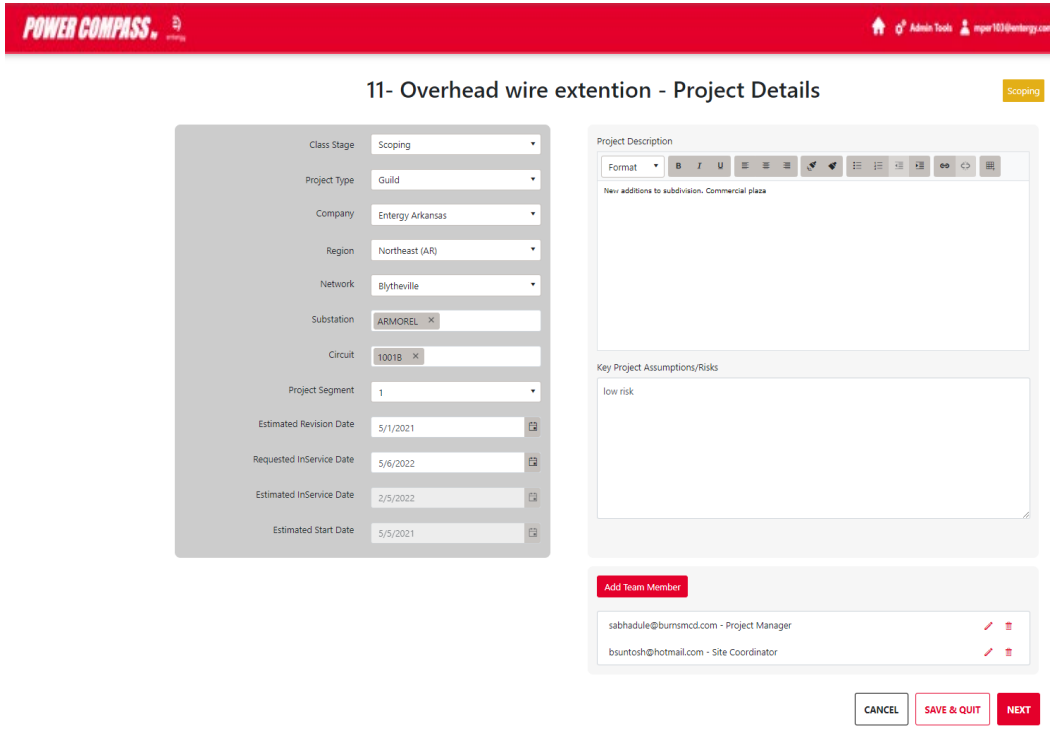
Entergy Estimating Software Tool

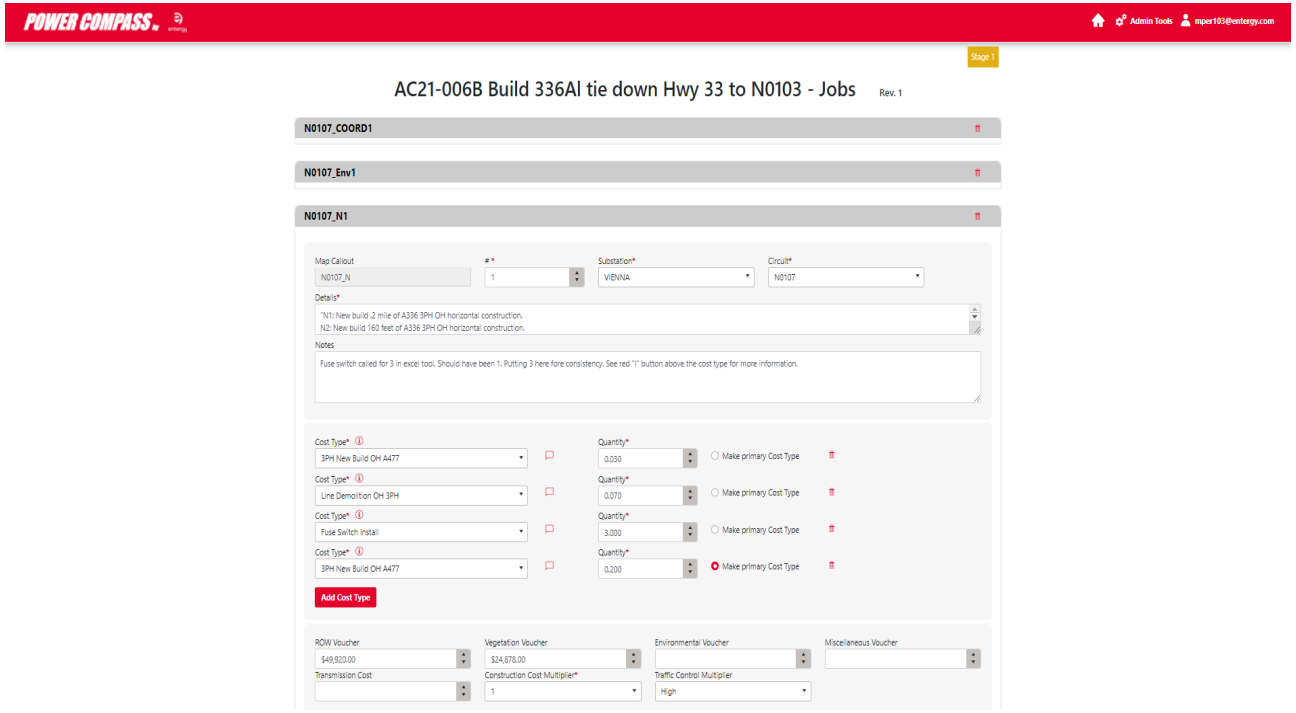
BUILD THE DATA INTELLIGENCE/MODEL



Entergy Estimating Software Tool

ESTIMATION → **USER PORTAL** → **WIZARD DRIVEN ESTIMATION** → VISIBILITY AND INSIGHTS AT EACH STAGE AND STATUS





Entergy Estimating Software Tool

ESTIMATION | USER PORTAL | WIZARD DRIVEN ESTIMATION | **VISIBILITY AND INSIGHTS AT EACH STAGE AND STATUS**

Stage 2

Cost Summary

Cost Category	2022 Total	2023 Total	2024 Total	Grand Total
Total Direct Estimate	$62,868.70	$1,735,603.76	$1,368,917.37	$3,167,389.83
Scope Uncertainty	$0.00	$624,088.86	$326,128.10	$950,216.96
Indirect Cost	$25,876.00	$859,751.00	$256,434.00	$1,142,061.00
Fully Loaded Cost	**$88,744.70**	**$3,219,443.62**	**$1,951,479.47**	**$5,259,667.79**

Construction MHRs: 12315.28

Cost Summary	Class 4 Estimates
Distribution Direct Costs	
Construction	$1,738,032.25
Design	$323,964.18
Materials & Supply	$584,556.77
Project Management & Oversight	$184,444.65
Vegetation Clearance	$59,000.00
Environmental	$81,000.00
ROW Inquiry/Acquisition	$196,392.00
Other	$0.00
Scope Uncertainty	$950,216.96
Total Distribution Direct Costs	**$4,117,606.81**
Distribution Indirect Costs	
AFUDC	$196,326.00
Allocation	$0.00
Cap Suspense	$766,038.00
Employee Benefits	($300.00)
M&S	$62,219.00
Stock Options Loader	$117,778.00
Total Distribution Indirect Costs	**$1,142,061.00**
Total Project Costs	
Fully Loaded Distribution Cost	$5,259,667.81
Fully Loaded Distribution Related Transmission Costs	$0.00
Fully Loaded Transmission Upgrade Costs	
Total Project Costs	**$5,259,667.81**

Cashflows

Cost Type	Cashflow Allocation					
	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Grand Total
Construction	$0.00	$0.00	$1,738,032.21	$0.00	$0.00	$1,738,032.21
Design	$32,396.40	$291,567.76	$0.00	$0.00	$0.00	$323,964.16
Materials & Supply	$0.00	$0.00	$584,556.81	$0.00	$0.00	$584,556.81
Project Management & Oversight	$18,444.45	$55,333.37	$92,222.31	$9,222.23	$9,222.23	$184,444.59
Vegetation Clearance	$0.00	$35,399.98	$23,600.01	$0.00	$0.00	$58,999.99
Environmental	$8,100.00	$32,400.01	$40,500.03	$0.00	$0.00	$81,000.04

POWER COMPASS | Admin Tools | sbhadul@entergy.com

Reports

Project Name | Project Type | Jurisdiction: Arkansas | Region | Cost Class Item (s): Construction, Design

Year (s): Single year / Range From: 2023 To: 2024

Aggregate Cost
Show go forward project only

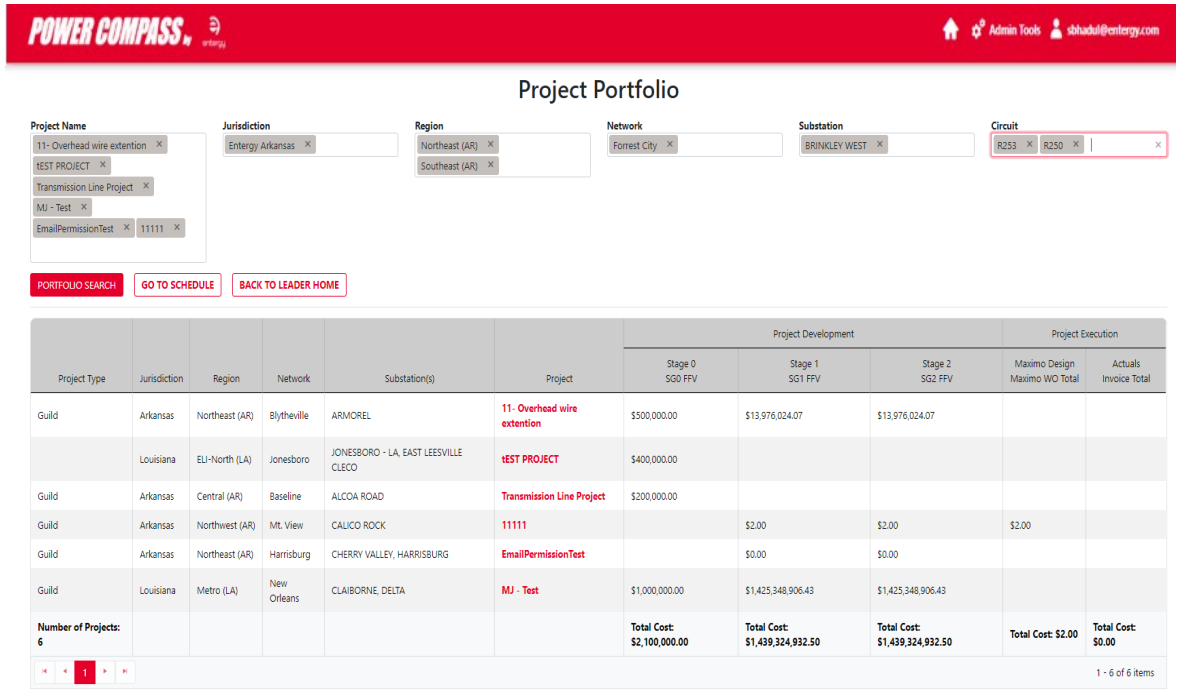
SEARCH | BACK TO LEADER HOME | EXPORT TO EXCEL

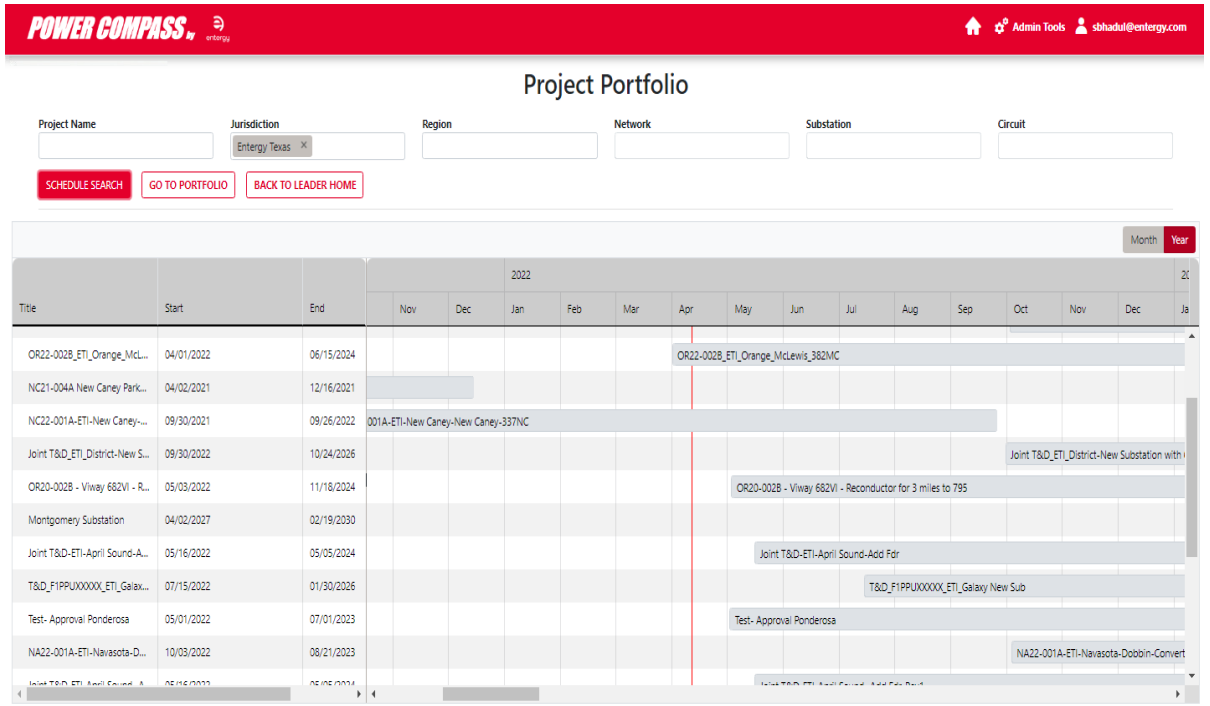
						2023				2024			
Project Type	Jurisdiction	Region	Project	Stage	Status	Construction	Design	Total Direct Cost	Total Overall Cost	Construction	Design	Total Direct Cost	Total Overall Cost
PSK405	Arkansas	Northeast (AR)	BV22-006V EAL Batesville Network Moorefield P485	Stage 1	Approved	$518,900.82	$146,916.60	$1,597,961.34	$2,077,349.76	$691,867.76	$0.00	$1,430,028.18	$1,859,036.62
PSK405	Arkansas	Northwest (AR)	RS22-002A	Stage 1	Approved	$801,518.39	$37,726.29	$1,219,574.27	$1,219,574.27	$0.00	$0.00	$0.00	$0.00
PSK405	Arkansas	Northeast (AR)	SR22-005A	Stage 1	Approved	$454,389.35	$39,464.39	$972,585.91	$1,264,361.68	$0.00	$0.00	$0.00	$0.00
PSK405	Arkansas	Southwest (AR)	MA22-001V	Stage 1	Approved	$473,630.11	$73,756.63	$1,509,186.10	$1,961,941.93	$0.00	$0.00	$0.00	$0.00
PSK405	Arkansas	Southwest (AR)	MA22-002V	Stage 1	Approved	$646,291.90	$48,108.30	$1,706,117.56	$2,217,952.82	$0.00	$0.00	$0.00	$0.00
PSK405	Arkansas	Northwest (AR)	HN22-004V_EAL_Harrison_Harrison West_S218	Stage 1	Approved	$0.00	$0.00	$2,366.78	$2,366.78	$0.00	$0.00	$0.00	$0.00

Total (Construction, Design) Estimate Spending: $8,285,915.33

Entergy Estimating Software Tool

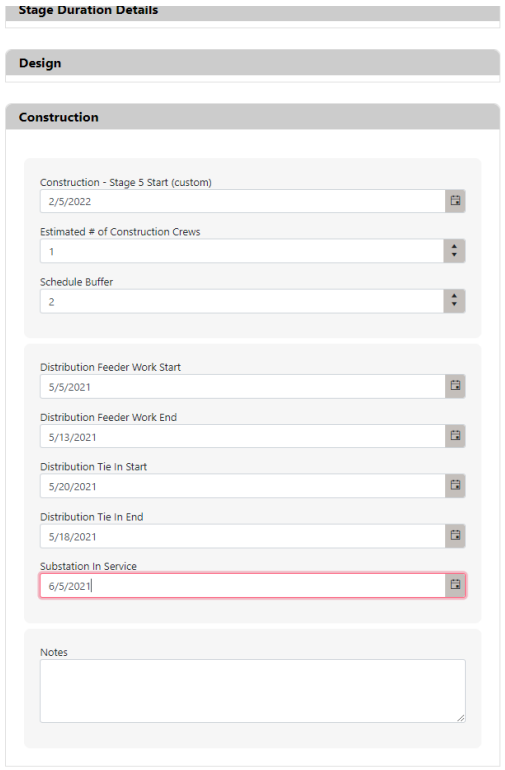
LEADERSHIP VIEW & ANALYSIS | **PORTFOLIO VIEW** | **VERSIONS OF ESTIMATE** | **COMPARE COSTS AT STAGES** | **DRILL DOWN ANALYSIS** | **EXECUTIVE PERSONA VIEW**

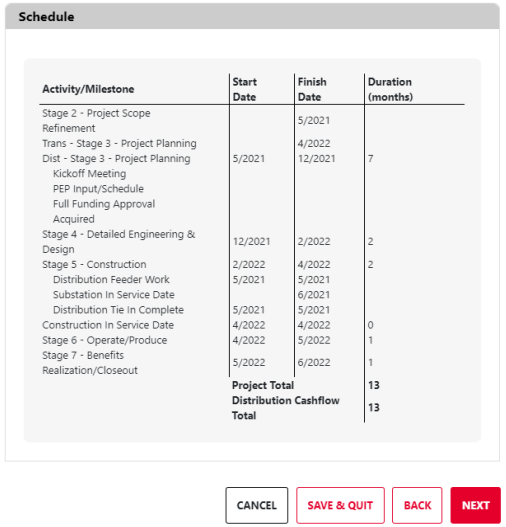


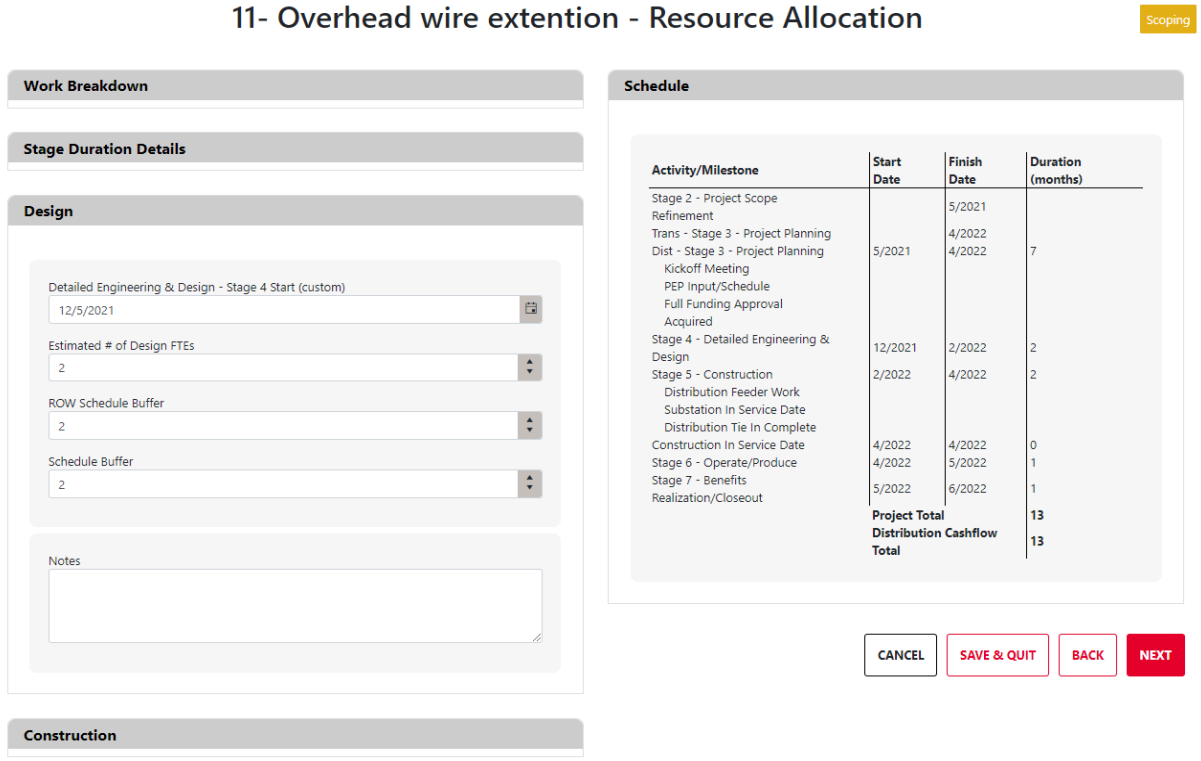


Entergy Estimating Software Tool

RESOURCE ALLOCATION | **% OF RESOURCES IN STAGES** | **CREWS/ FTES** | **EXTERNAL VS INTERNAL RESOURCES** | **SCHEDULING**







Entergy Estimating Software Tool

CASH FLOW | **SPEND PER MONTH AND YEAR** | **SPEND PER PHASE/STAGE** | **PORTFOLIO SPEND FOR SPECIFIC TIME RANGE**

Scoping

Planning

Cost Summary

Cashflows

Cost Type	Cashflow Allocation					
	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Grand Total
Construction	$75,866.63	$379,333.28	$6,827,998.86	$75,866.65	$227,599.96	$7,586,665.38
Design	$826,366.59	$826,366.56	$330,546.60	$991,639.90	$330,546.63	$3,305,466.28
Materials & Supply	$615,225.87	$615,225.92	$1,230,451.74	$430,658.09	$184,567.75	$3,076,129.37
Project Management & Oversight	$952.63	$952.64	$952.56	$952.62	$952.62	$4,763.07
Scope Uncertainty	$30,368.24	$36,437.60	$167,799.06	$29,982.35	$14,873.34	$279,460.59
Indirect Cost	$760.69	$912.64	$4,203.00	$751.01	$372.55	$6,999.89
Fully Loaded Cost	**$1,549,540.65**	**$1,859,228.64**	**$8,561,951.82**	**$1,529,850.62**	**$758,912.85**	**$14,259,484.58**

Cost Category	2021 Total	2022 Total	2023 Total	2024 Total	Grand Total
Construction	$99,574.96	$587,966.57	$3,485,124.42	$3,413,999.43	$7,586,665.38
Design	$878,014.50	$1,941,961.45	$320,217.03	$165,273.30	$3,305,466.28
Materials & Supply	$653,677.49	$1,076,645.28	$730,580.73	$615,225.87	$3,076,129.37
Project Management & Oversight	$1,012.17	$2,619.72	$654.90	$476.28	$4,763.07
Scope Uncertainty	$32,645.59	$72,183.89	$90,731.58	$83,899.53	$279,460.59
Indirect Cost	$817.73	$1,808.04	$2,272.62	$2,101.50	$6,999.89
Fully Loaded Cost	**$1,665,742.44**	**$3,683,184.95**	**$4,629,581.28**	**$4,280,975.91**	**$14,259,484.58**

Project Component Summary

EXPORT TO EXCEL | EXPORT PORTFOLIO VIEW | VIEW PSP | CANCEL | SAVE & QUIT | BACK | SUBMIT

Next Steps…Roadmap

PowerCompass

- Streamline Stage 5 – Planning support
- Enhance PowerCompass to enable Stage 3 estimates – One Application
- Automate “Actuals” integration for full financial insights and analytics – lessons learned
- Drive estimates based on historical project data – AI

Stage gate journey

- T&D Partnership

Questions?