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THE FUTURE OF ENERGY LIVES HERE

HOW HOLISTIC OPTIMIZATION CAN SAVE YOUR MEGAPROJECT $100,000,000

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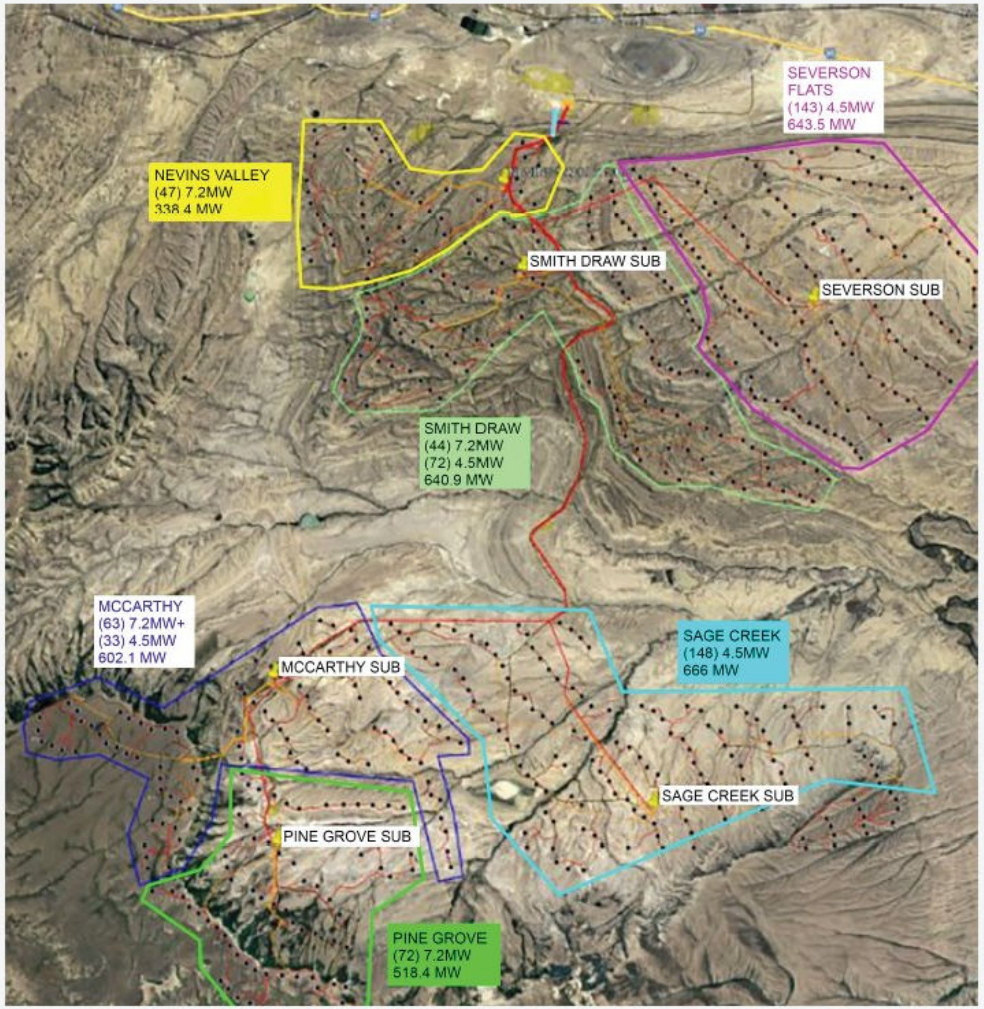
MEGAPROJECTS

- Sets of generation, load, and transmission projects related to a given corridor. Total capacity >1 GW.

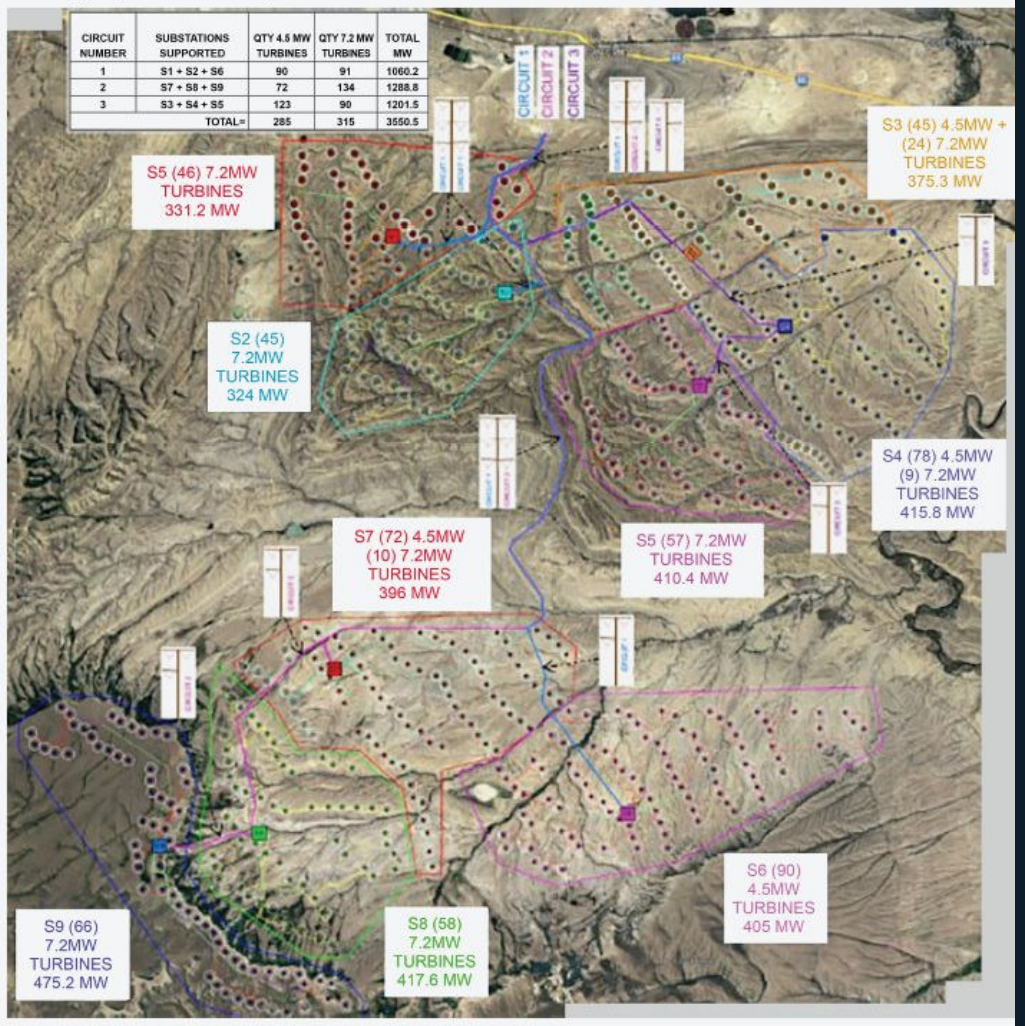
CASE STUDY – 3.5GW WIND PROJECT

Previous Layout



Ulteig Optimized Layout

CIRCUIT NUMBER	SUBSTATIONS SUPPORTED	QTY 4.5 MW TURBINES	QTY 7.2 MW TURBINES	TOTAL MW
1	S1 + S2 + S6	90	91	1060.2
2	S7 + S8 + S9	72	134	1288.8
3	S3 + S4 + S5	123	90	1201.5
	TOTAL=	285	315	3550.5



CASE STUDY – 3.5GW WIND PROJECT

PREVIOUS LAYOUT				
SUBSTATION DESIGN				
SUB NAME	NAME PLATE	# OF MPTs	SIZE OF MPTs	# OF SWITCH-BREAKER-SWITCH
SUB #1	338.4	2	222	3
SUB #2	643.5	4	222	5
SUB #3	640.8	4	222	5
SUB #4	666	4	222	5
SUB #5	602.1	4	222	5
SUB #6	518.4	3	222	4
TOTALS=	3409.2	21		27

COLLECTION DESIGN		
UNDERGROUND COLLECTION LENGTH	1,745,346	FT
OVERHEAD COLLECTION LENGTH	119.7	MILES

TRANSMISSION DESIGN		
CONDUCTOR	(2) 1113KCMIL ACSR "BLUEJAY" PER PHASE	
SINGLE CIRCUIT LENGTH	31.2	MILES
DOUBLE CIRCUIT LENGTH	30.0	MILES

ULTEIG DESIGN				
SUBSTATION DESIGN				
SUB NAME	NAME PLATE	# OF MPTs	SIZE OF MPTs	# OF SWITCH-BREAKER-SWITCH
S1	331.2	2	185	1
S2	324	2	185	1
S3	375.3	2	230	2
S4	415.8	2	230	1
S5	410.4	2	230	1
S6	405	2	230	1
S7	396	2	230	2
S8	417.6	2	230	2
S9	475.2	2	265	1
TOTALS=	3550.5	18		13

COLLECTION DESIGN		
UNDERGROUND COLLECTION LENGTH	1,715,943	FT
OVERHEAD COLLECTION LENGTH	75.5	MILES

TRANSMISSION DESIGN		
CONDUCTOR	(2) 1272KCMIL ACSR "PHEASANT" PER PHASE	
SINGLE CIRCUIT LENGTH	33.1	MILES
DOUBLE CIRCUIT LENGTH	20.0	MILES

THE BIG IDEA

Optimizing each piece of a megaproject in isolation leaves massive savings on the table.

Only by optimizing the entire electrical system together — generation, collection, substations, and transmission — can you unlock the full value of your project.

$100 MILLION SAVINGS

- System Level Inefficiencies
  - Individual ≠ best for system
- Smart Early-Stage Decisions
  - Early decisions carry the most impact
- Traditional Optimization Risks/Trade-offs

SILOED OPTIMIZATION

OPTIMIZATION EFFORTS

- Local Optimization Trap
- Understand important trade-offs: MV v. HV
- Impact of substation siting and sizing

1 345kV line = 1,000 MW = 40 MV collection lines

YOUR NEXT MEGAPROJECT

- **Start with the whole system** — optimize generation, collection, substations and transmission together from day one
- **Challenge the trade-offs early** — MV vs. HV, overhead vs. underground, substation siting and sizing all interact
- **Break down the silos** — cross-discipline collaboration is where the $100M savings hide

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THANK YOU!

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