

MAKING THE MOST OF THE POWER PLANT MARKET

Best Practices for All-Source Electric Generation Procurement

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A B O U T

ENERGY INNOVATION: POLICY AND TECHNOLOGY LLC

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WHY IS GENERATION RESOURCE PROCUREMENT IMPORTANT?

- Resource options and economics are shifting quickly
- Vigorous market competition should inform utility executives' and commissioners' decisions
- Renewables are displacing gas in head-to-head competition



THE RESOURCES SPEAK FOR THEMSELVES

RFP Responses by Technology

Generation Technology	# of Bids	Bid MW	# of Projects	Project MW	Median Bid	
					Price or Equivalent	Pricing Units
Combustion Turbine/IC Engines	30	7,141	13	2,466	\$ 4.80	\$/kW-mo
Combustion Turbine with Battery Storage	7	804	3	476	6.20	\$/kW-mo
Gas-Fired Combined Cycles	2	451	2	451		\$/kW-mo
Stand-alone Battery Storage	28	2,143	21	1,614	11.30	\$/kW-mo
Compressed Air Energy Storage	1	317	1	317		\$/kW-mo
Wind	96	42,278	42	17,380	\$ 18.10	\$/MWh
Wind and Solar	5	2,612	4	2,162	19.90	\$/MWh
Wind with Battery Storage	11	5,700	8	5,097	21.00	\$/MWh
Solar (PV)	152	29,710	75	13,435	29.50	\$/MWh
Wind and Solar and Battery Storage	7	4,048	7	4,048	30.60	\$/MWh
Solar (PV) with Battery Storage	87	16,725	59	10,813	36.00	\$/MWh
IC Engine with Solar	1	5	1	5		\$/MWh
Waste Heat	2	21	1	11		\$/MWh
Biomass	1	9	1	9		\$/MWh
Total	430	111,963	238	58,283		

THE RESOURCES SPEAK FOR THEMSELVES CONT'D

UTILITY	RFP TYPE	STATUS	BIDS
PNM	All-Source RFP	Pending 2020	735
Xcel Colorado	All-Source RFP	Approved 2018	417
Georgia Power	Comprehensive single-source RFPs	2015 Gas / 2017 RE Pending 2020	221 TBD
Minnesota Power	Comprehensive single-source RFPs	Approved 2018	115
NIPSCO	All-Source RFP	Announced 2018	90
El Paso Electric	All-Source RFP	Pending 2020	81
California	All-Source RFP	Various	(varied)
Florida	Single-source RFPs	Approved 2016	0 or few
Dominion Energy Virginia	Single-source RFP	Suspended 2019	n/a
Duke - North Carolina	Comprehensive single-source RFPs	Pending	n/a

PNM PORTFOLIO OPTIONS

	PNM PORTFOLIO	CCAЕ PORTFOLIO	RESOURCE PRICE
Wind (already under contract)	140 MW	140 MW	\$17 / MWh
Solar / Battery Hybrid	350 / 60 MW	650 / 300 MW	\$19-20 / MWh + \$7-10 / kw-mo
Standalone Battery	70 MW	0	\$1,211-1,287/kW + \$9-10 / kw-year
Gas Turbine	280 MW	0	\$680 / kW + \$3 / kw-year + fuel costs
Energy Efficiency in 2023	53 MW	69 MW	\$263 / first-year MWh
Demand Response in 2023	38 MW	69 MW	\$95 / kw-year
2022-2038 System CO ₂ emissions	21.9 million tons	20.3 million tons	
Forecast System Cost 2022-2038 (net present value)	\$5.26 billion	\$5.33 billion	

OUR FOCUS: VERTICALLY INTEGRATED UTILITIES

- About half of the United States utility sector operates outside wholesale power markets
- Many utilities in Southwest Power Pool (SPP) and Midcontinent Independent System Operator (MISO) continue to be regulated as vertically integrated utilities
- Market Power:
 - Monopolies – Customers have little choice of utility service
 - Monopsonies – Power sellers *also* have little choice of utility market

REPORT METHOD

- Evaluated four main case studies:
 - Xcel Colorado ← Our recommended model
 - Public Service Company of New Mexico (PNM)
 - Georgia Power
 - Minnesota Power
- Reviewed six other case studies, but less comprehensively
- Developed best practices based on what worked vs what led to problems
- Reviewed and revised based on feedback from over two dozen practitioners and experts

DETERMINE THE NEED

Regulators should use the resource planning process to determine the technology-neutral procurement need.

Define in terms of:

- Load forecast
- Potential plant retirements

Do *not* define in terms of:

- A specific, numeric capacity target
- Technology specification



ALL-SOURCE PROCUREMENT

Regulators should require utilities to conduct competitive, all-source bidding processes, with robust bid evaluation.

- Open to all technologies
- Model selects the mix of capacity and energy to meet the utility's need
- Not multiple, single-source procurements



ALL-SOURCE PROCUREMENT

Addressing Demand Response in All-Source RFPs:

- Address technology performance in bid evaluation, not qualifications
- Demand response requires significant development time between contract award and online date, plus negotiation of proposal-specific measurement and verification
- Examples:
 - For long duration needs, combining multiple small offers requires custom evaluation – clarify criteria up front
 - Peaking capacity for fast response can either be valued (\$/kW), or best bids that meet a fast response target (MW) get selected first



ADVANCE REVIEW

Regulators should conduct advance review and approval of procurement assumptions and terms.

- Advance review of:
 - Assumptions
 - Bid evaluation process
 - Contract terms and conditions
- Most RFP processes currently provide for review after the RFP is complete
- Advance review avoids forcing an up-or-down decision using contested methods



UTILITY OWNERSHIP PROTECTIONS

Regulators should renew procedures to ensure that utility ownership is not at odds with competitive bidding.

- Regulators often allow utilities to participate in their own RFPs
 - Utilities may also buy out winning bids
- Most resource practices have
 - Utility code of conduct
 - Independent evaluator
- More attention to complexity
 - Multiple resources
 - Different ownership models (e.g., implications of operating entity for tax purposes)



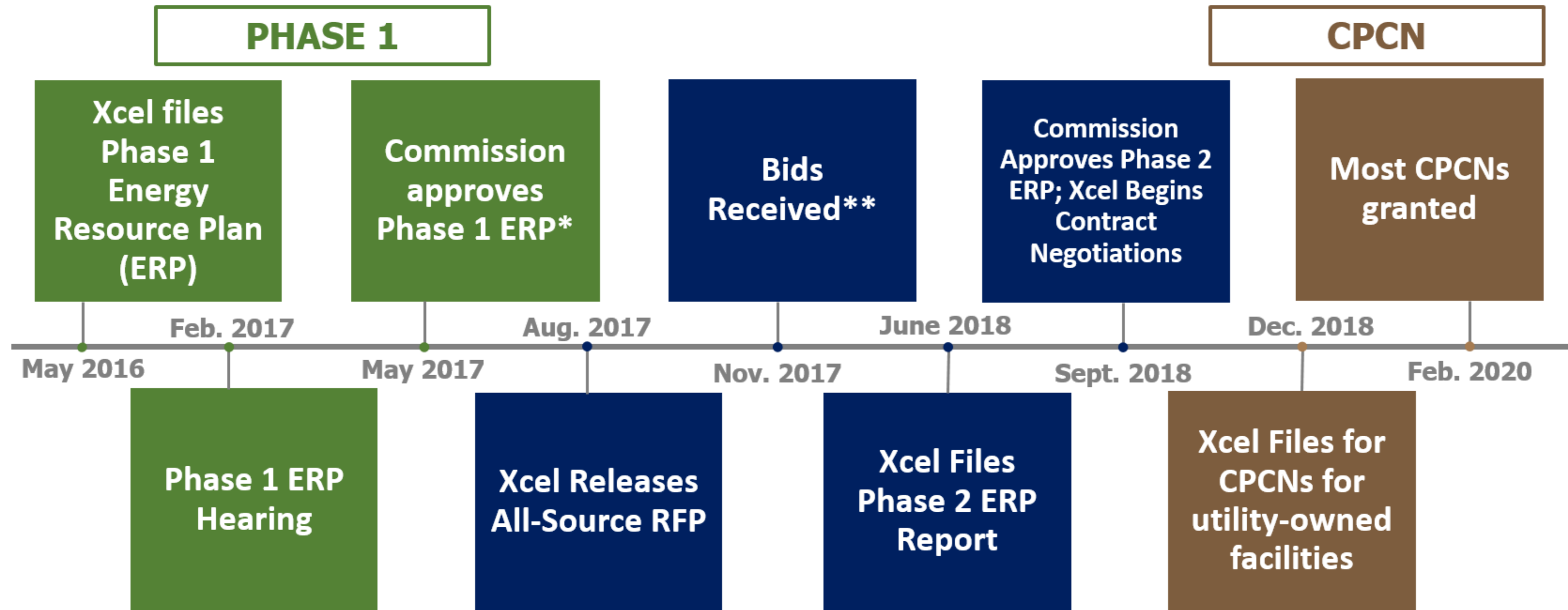
RULES FOR FAIRNESS

Regulators should revisit rules for fairness, objectivity and efficiency.

- Fairness, objectivity and efficiency:
 - Treatment of bidders
 - Engagement of stakeholders
- Contract terms should be pre-approved in a public process
- Stakeholders can challenge assumptions and methods to ensure objectivity
- Utilities with leverage can pressure regulators to make “constructive” decisions to approve the utility’s preferred outcome



XCEL COLORADO PROCUREMENT



* Commission later approved an ERP to retire two coal plants
 ** Bids were later allowed to be adjusted in response to the Tax Cut Jobs Act and new solar panel tariffs

PHASE 2

QUESTIONS + CONTACT

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