Capital Planning Issues
- Getting to the Next Level

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Agenda

- Auditability is now essential
- Prioritization starts with high-level categorization
- The next level: Not just annual ‘rack and stack’
- Prioritization and prudence
- Implementation and integration
- Examples: Load Relief and Reliability
- Questions

How auditable is your capital planning process?

The drivers of the process today:

- Sarbanes-Oxley and Public Service Commissions require deep auditability
  - Not: multiple, de-centralized Excel spreadsheets in various departments
- NERC pushing for INPO-style Documentation
  - "Not documented – not done"
- Need: "Decision Basis Documentation" as in:
  - Nuclear-style (like Design Basis)
  - Production-grade database
  - Version "as of xx/xx/2013", etc.

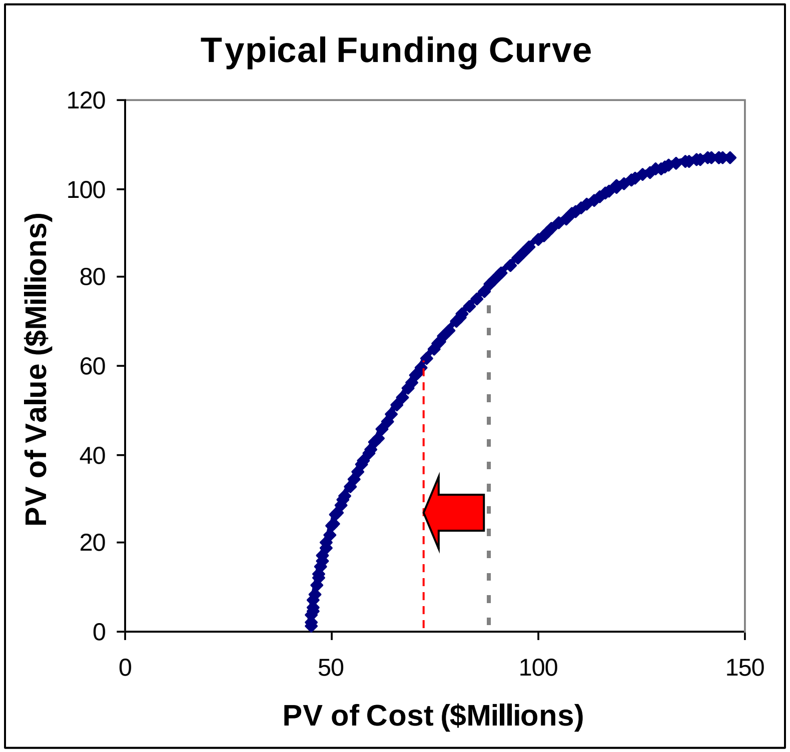
Excel spreadsheets are fine for a pilot proof-of-concept, but that must be replaced by a production-grade, auditable capital planning system

Prioritization begins with good high-level categorization

Typical spending prioritization:

- 'Must Do' – value not assigned
  - New connections
  - Public Improvement (road moves)
  - Outage restoration
  - Safety programs
- Capacity reinforcement (driven by growth)
- Reliability
  - Imminent failure, worst performers
  - First, second-tier maintenance
  - ~~First- tier replacement~~ ***deferred***
- ~~Renewal/modernization~~ ***deferred***
  - ~~Second-tier replacement~~ ***deferred***
- ~~Efficiency~~ ***deferred***

Illustrative, for a million-customer utility

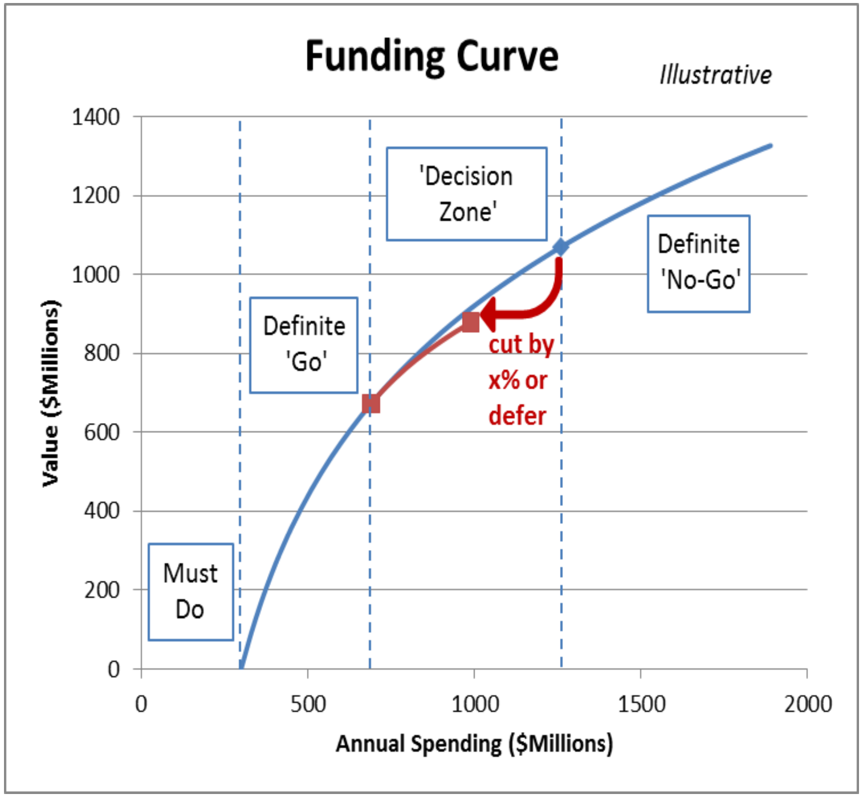


Without high-level categorization of thousands of projects, management can't see the forest for the trees, can't develop directional strategy

Good prioritization goes beyond an annual 'rack and stack' exercise

Steps in getting to the next level:

- 'Decision zone', not just cut line
  - Progressive cuts, not 'all or nothing'
- Sensitivity/risk analysis
  - Not just point estimates
- Impact on performance
  - SAIDI/SAIFI, goal targets
- Monthly/Quarterly review
  - Changes in scope and funding
  - Emerging projects



Prioritization is an <u>aid</u> to good judgment, not a <u>substitute</u> for it. It helps focus on the important and eliminates the clutter in the decision process.

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How does prioritization relate to prudence?

Key points to reinforce relative to prudence:

- Prudence is based on more than prioritization
  - Even if prioritization uses benefit/cost, it is not a test of prudence
  - Prudence is based on the entire process, from rate setting to procurement
- Prioritization is a screening tool
  - One part of the overall process
  - Similar to peer review, a check of assumptions and alternatives
  - Allows management to focus on the exceptions, give them more scrutiny

Resource Management

Project Management

Prioritization

Engineering & Ops

Design Standards

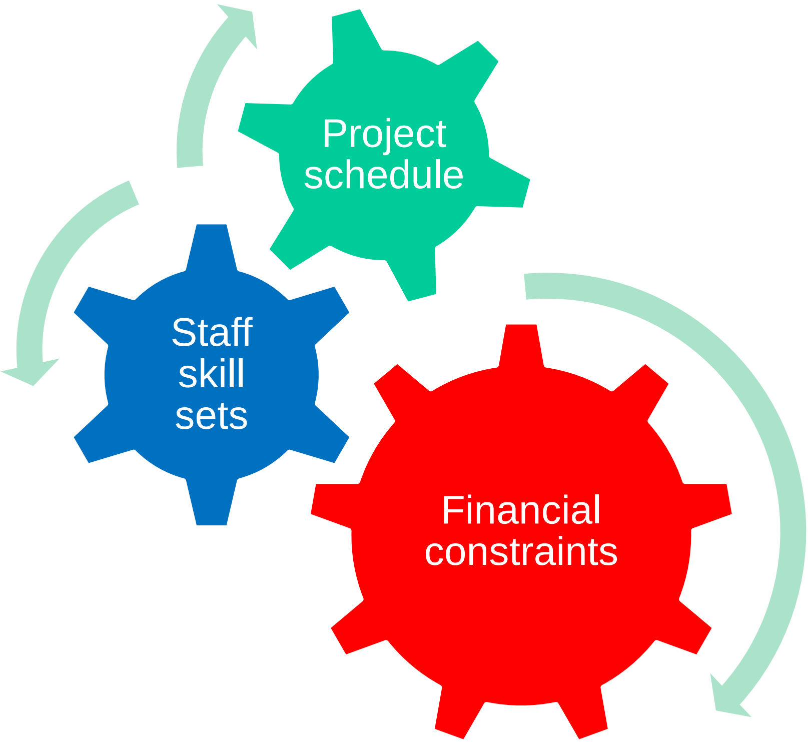
Rates and Tariffs

Utilities must refute the presumption that the result of a rack and stack is the entire basis for doing or not doing projects. It is just a screening tool.

Implementation success requires integration

Some keys to implementation success:

- Executive sponsorship
  - Don't leave home without it
- Enterprise integration
  - How does this fit into the whole?
  - Integrated with finance schedule?
- High-performance team
  - Engineering, Finance, Regulatory, IT
  - Experienced staff/consultant (Have they ever done this before? Well?)
  - Proven software, reliable vendor



To keep all the gears moving in the right direction, the process must be well integrated. A good system can help with that.

Example: substation load relief must be valued

Using a number like $25,000 per Expected MWH of outage avoided

Project: Upgrade existing 69kV/13.2kV 20MVA transformer with a 50MVA transformer and switchgear

Reason: Loss of either existing transformer (20, 25MVA) would result in load loss of 4 MVA (20MVA in 10 years)

In addition, by 2018 it reaches normal overload condition

Cost: $1,560,000 for 1-50MVA transformer, a circuit switcher, and four new breakers

Benefit: Avoid a 1% chance of having to shed 4 to 20 MW of load for 20 hours during a summer contingency

Quick calculation: Benefit of $2,100,000, cost of $1,560,000, ratio = 1.35 (Again, the model has more details)

	Xfrmr Failure	Exposure Factor	MW At Risk	Outage Hours	EMWH Saved	Value per MWH	Annual Benefit	Present Value
1st	4%	25%	12	20	2.4	$25,000	$60,000	$600,000
Normal	N/A	5%	5	24	6.0	$25,000	$150,000	$1,500,000
Total							$210,000	$2,100,000

Note: Even the quick calculation reveals some key points -

- Without the normal overload, the benefit would only be $0.6M. More MW would need to be at risk for $1.56M of cost
- The transformer failure rate, normally 2%, is doubled here because there are two transformers that could fail
- The model has an option to raise the failure rate of the contingency as the normal overload increases significantly

Similarly, distribution reliability can use values like $25 per CI

For example, where worst circuit programs target customer interruptions

Project: Perform remedial work on worst circuits

Reason: Avoid customer interruptions for customers experiencing multiple outages

Cost: $1.5 million for first tier ("worst first")

Benefit: Reduce outages and customer interruptions by 20%, saves operating cost and reduces risk

Quick calculation: Benefit of $3,000,000, cost of $1,500,000, ratio = 2.0 (At a cost of $94 per avoided CI per year)

	Feeder SAIFI	Outs, Cust. Per Feeder	Reduction factor	Feeders Remediated	Outs,CIs Saved	Value per outage,CI	Annual Benefit	Present Value
Outages	**-**	**25**	**20%**	**20**	**100**	**$500**	**$ 50,000**	**$ 333,333**
CI's	**4.0**	**1,000**	**20%**	**20**	**16,000**	**$25**	**$400,000**	**2,666,666**
Total							**$450,000**	**3,000,000**

Note: Many companies rank distribution projects by cost per CI avoided, at rates from $50-$300 per CI

- Effective discount rate is 15% because remediations are assumed to deteriorate at 5% per year

-$25 per avoided CI is (and should be?) about 20% of the value implied by $25,000 per MWH (At 5 kWH per CI)

- When this 'macro' model sets the right benefit ratio and value, a 'micro' model can be used to pick circuits

- Other programs modeled similarly are URD replacement, tree trimming, line inspection/repair, etc.

Reliability event cost parameters facilitate value discussion

Values like $25k per MWH and $25 per CI help to anchor the discussion

Using $25k per MWH for major events and $25 per CI for normal distribution feeder events implies a different value for different types of events, i.e.,

If the typical customer is 4kW, and typical CAIDI is 90 minutes, then $25k per MWH implies $150 per CI (and would be $1.66 per CMI), or 6 times $25:

$$\frac{\$25{,}000}{\text{MWHour}} \times \frac{\text{MW}}{1{,}000\ \text{kW}} \times \frac{4\ \text{kW}}{\text{Customer}} \times \frac{1.5\ \text{Hours}}{\text{Interruption}} = \frac{\$150}{\text{CI}}$$

Starting with values like these, companies may discuss how to vary by:

- Urban versus rural (although usually customer density covers this)
- Visibility or ‘front page news’ factor (e.g., higher for major events)
- Region or jurisdiction (but try it first at equal values for all)

Questions?

Some things to think about when you leave:

- Have your regulators asked for details of your capital planning in rate discovery?
- Is your capital planning process integrated with the rest of the enterprise?
- Are your Board of Directors, external auditors, and internal risk management committees wanting to peel back the covers and look inside the black box that is your capital planning?
- Do you have the right combination of resources focused on the problem?
- Are your people ready to take you to the next level?

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Now is a good time to bring your capital planning to the <u>next level</u>.

Encourage your team to <u>learn</u> what they need to <u>know</u> to do that.

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