

Total Economic Value Approach to Prioritizing Transmission Sustain Programs

Capital Investment Review Workshop
April 19, 2012

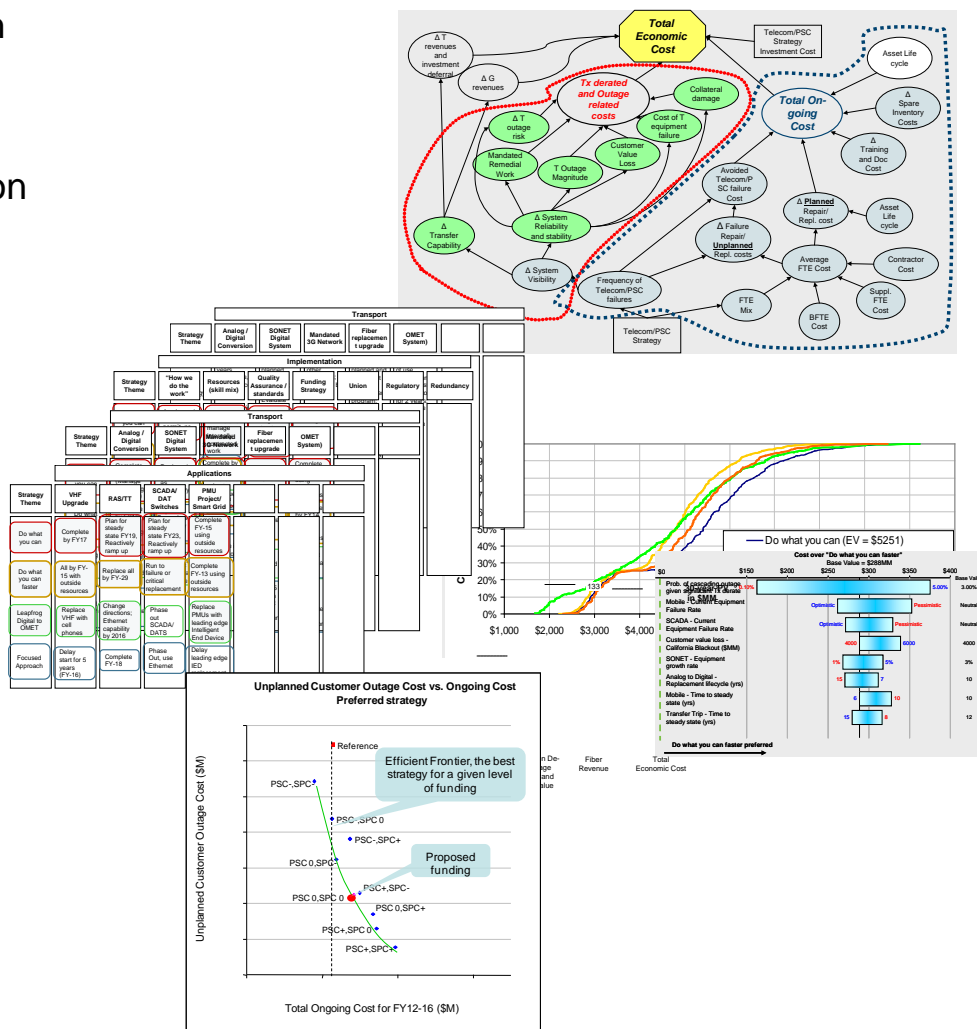


Background and Purpose

- Why was this needed?
 - Advance the development of asset strategies and plans based on industry leading practices
 - Transmission requires a strategy that balances the need of higher reliability (lower customer outage cost) and lower cost for BPA
 - Provide a common means of quantification across asset programs
- Approach taken
 - Partnered with Strategic Decisions Group: consultants with solid experience in value based approach and decision processes under uncertainty
- Assets targeted for initial application
 - Power System Control assets targeted for pilot project in 2010 due to critical need for adequate replacement plan
 - Expanded in 2011 to include System Protection and Control and associated Control Center assets due to interdependencies between the three programs
- Goal
 - To provide a robust tool for making “best value” decisions and prioritizing across programs
 - Apply methodology to all Transmission Sustain Programs to ensure consistency

Methodology Framework

- Apply consistent and disciplined approach
 - Determine the appropriate frame
 - Develop creative, doable alternatives
 - Gather meaningful, reliable information
 - Identify clear value and trade-offs
 - Apply logically, correct reasoning
 - Commit to action
- Use value added tools for decision making
 - Strategy alternative tables
 - Value maps
 - Sensitivity analysis and risk maps
 - FTE, capital and expense forecast
 - Efficient frontier
- Involve the right people
 - SMEs
 - Technical staff
 - Managers
 - Steering committee
 - Executives sponsors
 - Staff accountable for execution



Components of Total Economic Cost

Total Economic Cost

Unplanned Outage Related Cost

- Customer and societal value losses due to transmission de-rates/outages
- Collateral damage/equipment failure
- Regulatory fines
- Mandated work triggered by regulatory/political response to high impact outage events

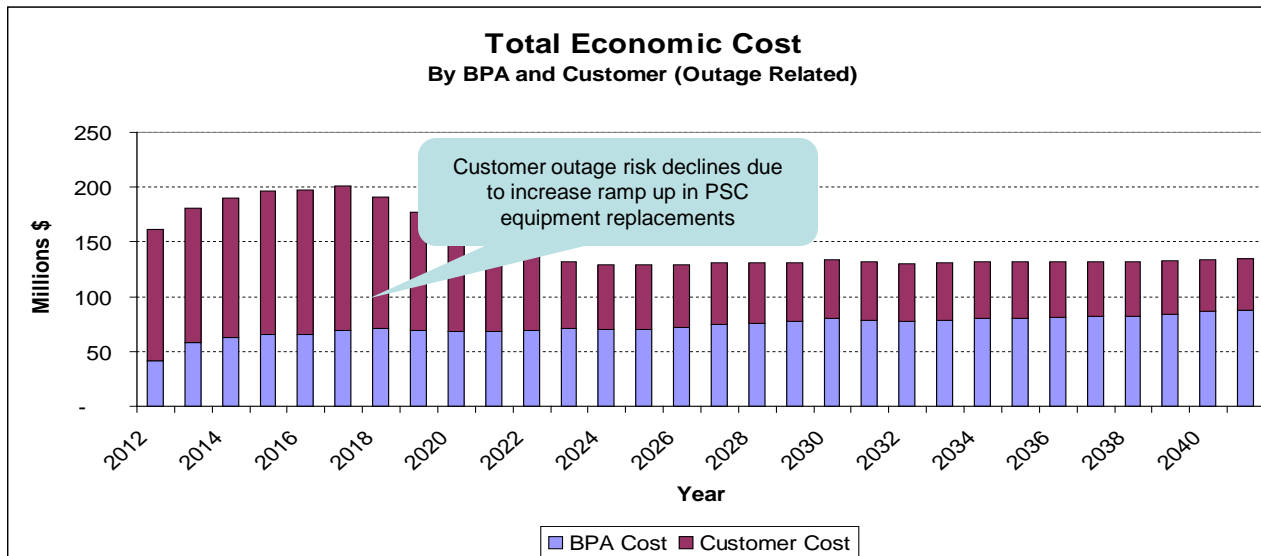
Ongoing Cost Capital and Expense

- FTEs
- Equipment (repair, replace, addition)
- Human errors – rework
- Documentation/
Training/Testing
- Inventory
- Overhead

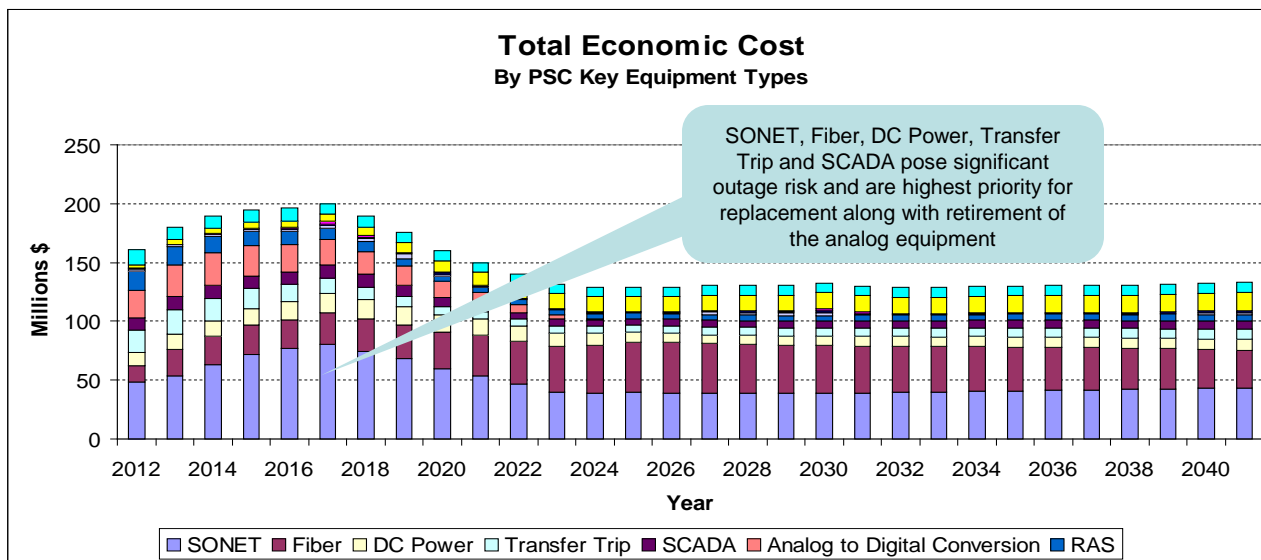
Planned Outage Cost

- Customer and societal value losses due to transmission de-rates/outages
- Collateral damage/equipment failure
- Regulatory fines
- Mandated work triggered by regulatory/political response to high impact outage events
- Cost linked to the increased risk during a planned outage. This is similar to unplanned customer outage.

Different Views of Total Economic Cost



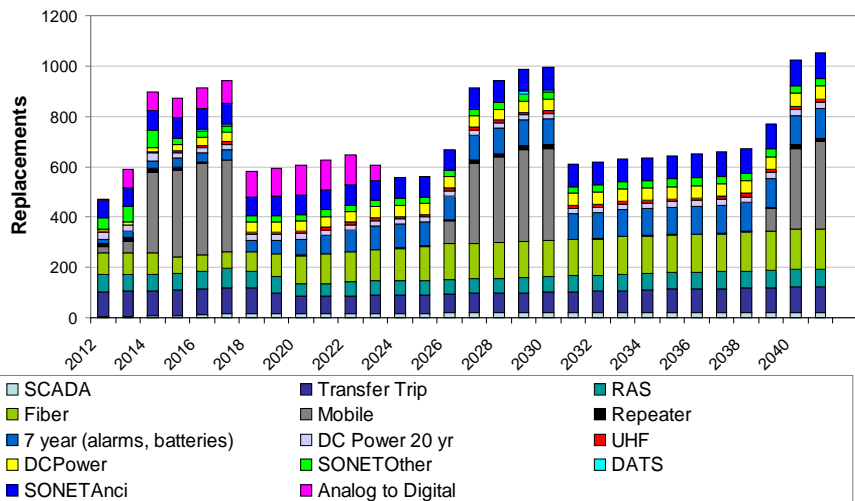
- There are two primary sources of cost being evaluated – BPA direct cost and avoided outage cost



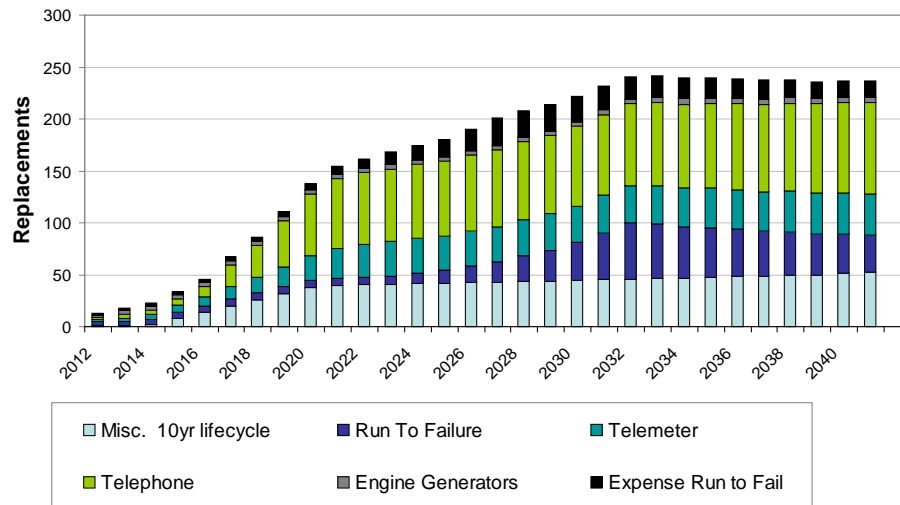
- The methodology provides insight into the contribution different equipment types have on Total Economic Cost

Prioritized equipment replacement by power system impact

Critical Replacements by Equipment Type



Non-Critical Replacements by Equipment Type



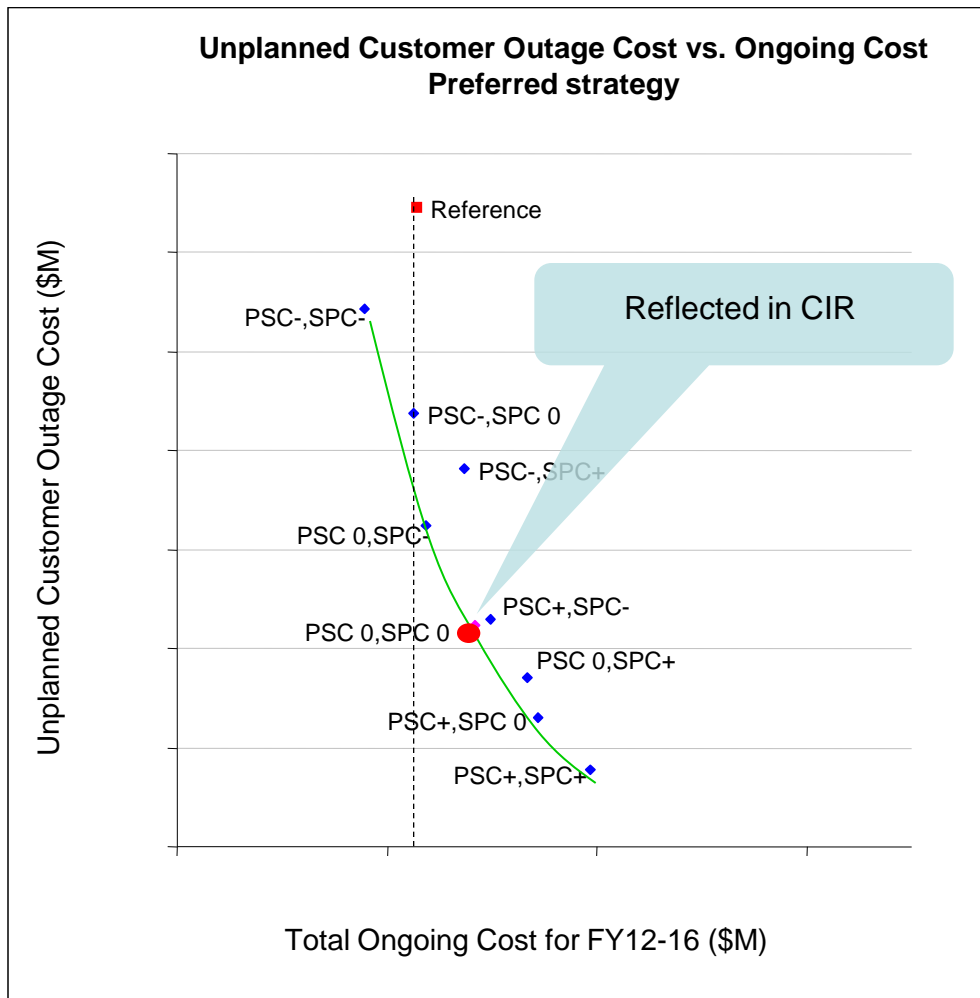
Highest priority is assigned to equipment that can lead to power system outages.

Periodic peaks are due to cyclical replacement of the VHF/Mobile system.

Replacements of non-critical equipment are held to predicted terminal failure rates in the early years.

The level of replacements ramps up in later years to overcome backlogs and to stay ahead of terminal equipment failures

Integration and prioritization of asset strategies between asset groups



Moving forward

- Deploy the methodology to strategy development for remainder of transmission sustain programs. Integrate programs where appropriate.
 - RAS
 - Alternating and Direct Current Substations
 - Wood pole lines, Steel lines, Rights of way
 - Control Centers
- Follow each strategy development with implementation planning
 - Equipment replacement plans created
 - Process improvements incorporated

