Seattle City Light – AMI Business Case Results

Energy and Environment Committee

June 26, 2012

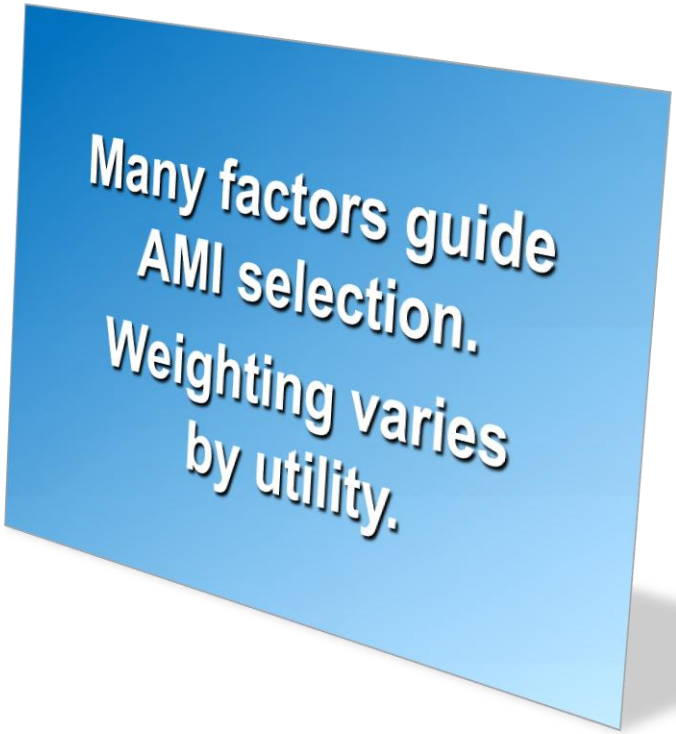
SAIC®

Briefing Outline

- Background
- AMI Business Case Overview
- City Light 2012 AMI Business Case Results

Background

- SCL studies and pilot project dating back to 2006
- Electro-mechanical meters are obsolete and out of production
- The majority of complaints SCL receives are billing related
- Meter reading at the premise significant labor costs and employee safety risks
- As meters age we lose revenue by under measuring usage
- Technology is now maturing with more capabilities



AMI Business Case Overview

- When done well, the AMI business case …
  - Establishes the value of the AMI investment
  - Validates the vision by documenting how AMI can fulfill the vision
    - With sufficient capability and performance
    - At acceptable cost
    - With acceptable risk
  - Guides the AMI project in extracting the predicted benefits

AMI = *Advanced Metering Infrastructure*

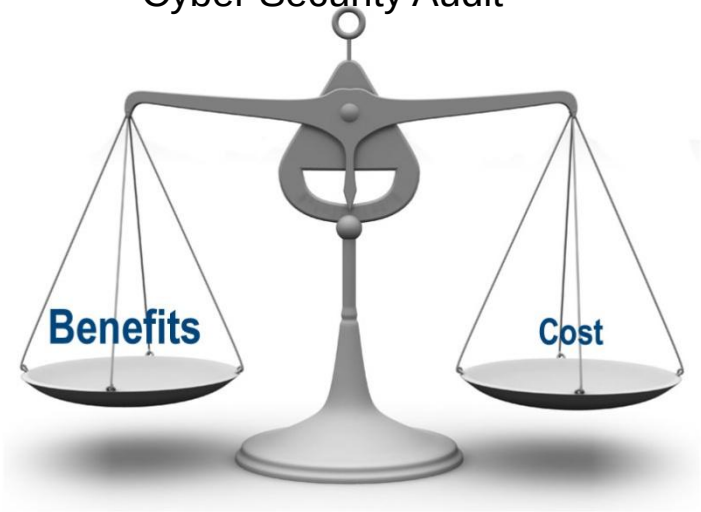
Business Case Analysis

Smart Grid Benefits

- Meter Accuracy
- Meter Reading Efficiency
- Billing Exceptions
- Billing Complaints
- Unbilled/Uncollectible Accounts
- Group Accounts
- Cash Flow
- Connects, Disconnects, and Account Transfers
- Outage Restoration
- Phase Balance
- Transformer Overloads and Sizing
- Vegetation Management
- Avoided CO_2 Emissions
- Pre-Pay
- Demand Response
- Voltage Optimization
- Distribution Automation
- Distributed Energy Resources

Costs

- Multi-million dollar implementation over a relatively small customer base
  - Meter Infrastructure
  - Communication Infrastructure
  - IT Infrastructure
  - Program Management
    - Project Management Office (PMO)
    - Customer Education
    - Business Process and Organizational Change
    - Cyber Security Audit



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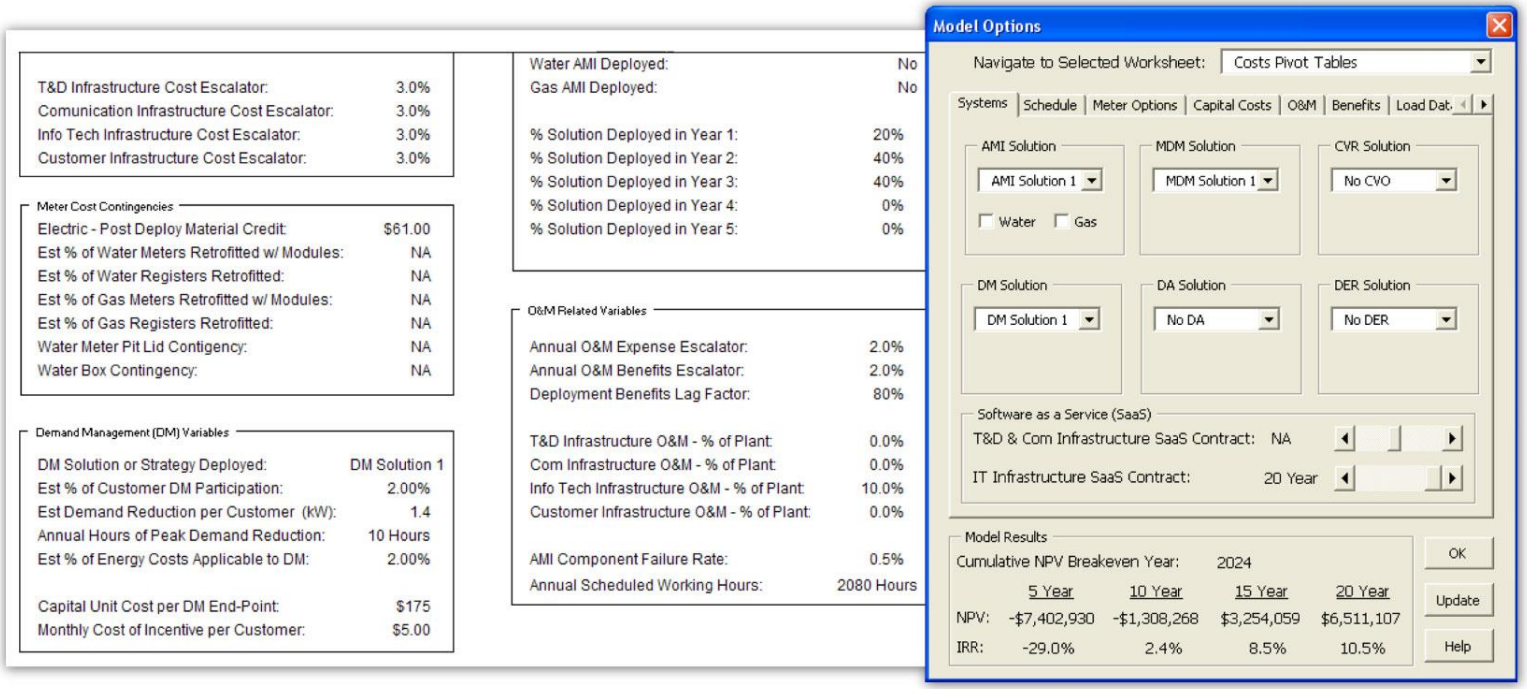
Business Case Key Inputs

- Meter infrastructure costs/growth
- Comm. infrastructure costs/growth
- IT infrastructure costs/growth
- System load data

- Operations and maintenance variables
- Wholesale related costs
- Staff labor and vehicle costs
- Financial variables



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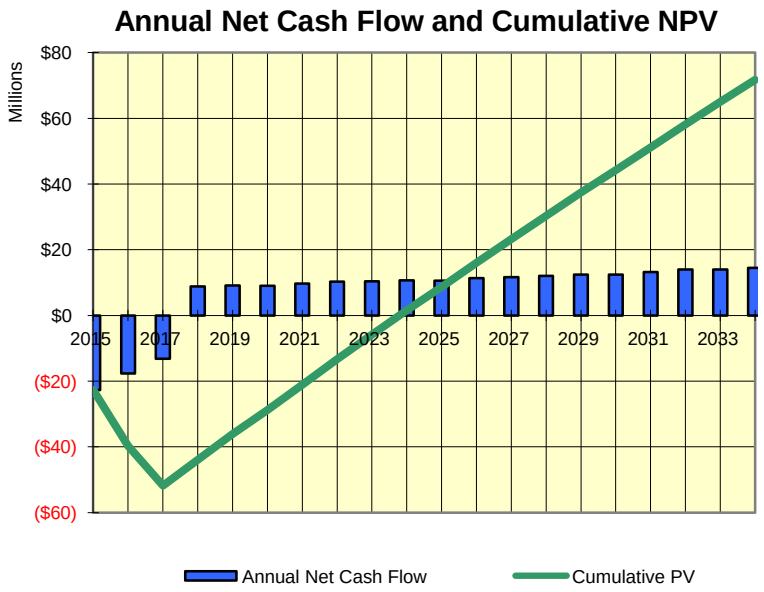
Business Case Key Outputs

- Net present value
- Internal rate of return
- Annual net cash flow
- Breakeven point
- Model comparison of solutions
  - AMI/MDMS technologies
  - Traditional Own-and-Operate to Smart Grid as a Service

AMI Business Case Summary for AMI Solution 2	5-Year	10-Year	15-Year	20-Year
Net Present Value (NPV)	($36.2 M)	$1.60 M	$37.4 M	$71.8 M
Internal Rate of Return (IRR)	NA	4.7%	12.3%	14.8%
Cumulative NPV Breakdown	2024			

- Benefits chart breakdown by department
- Benefits breakdown by meter
- Costs chart breakdown by department
- Costs breakdown by meter
- Capital and O&M costs



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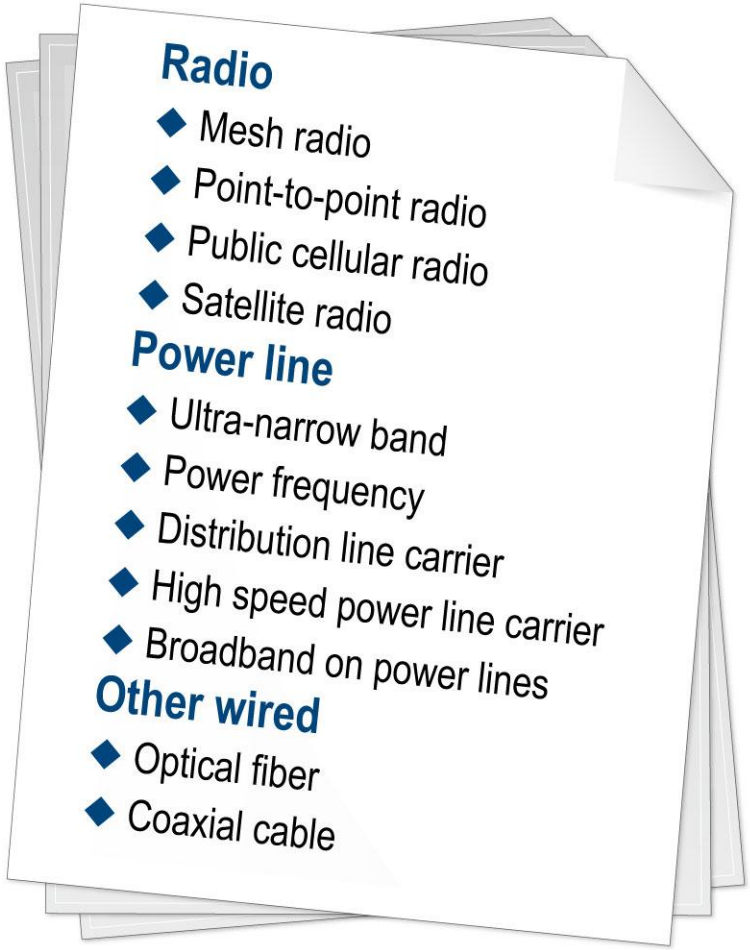
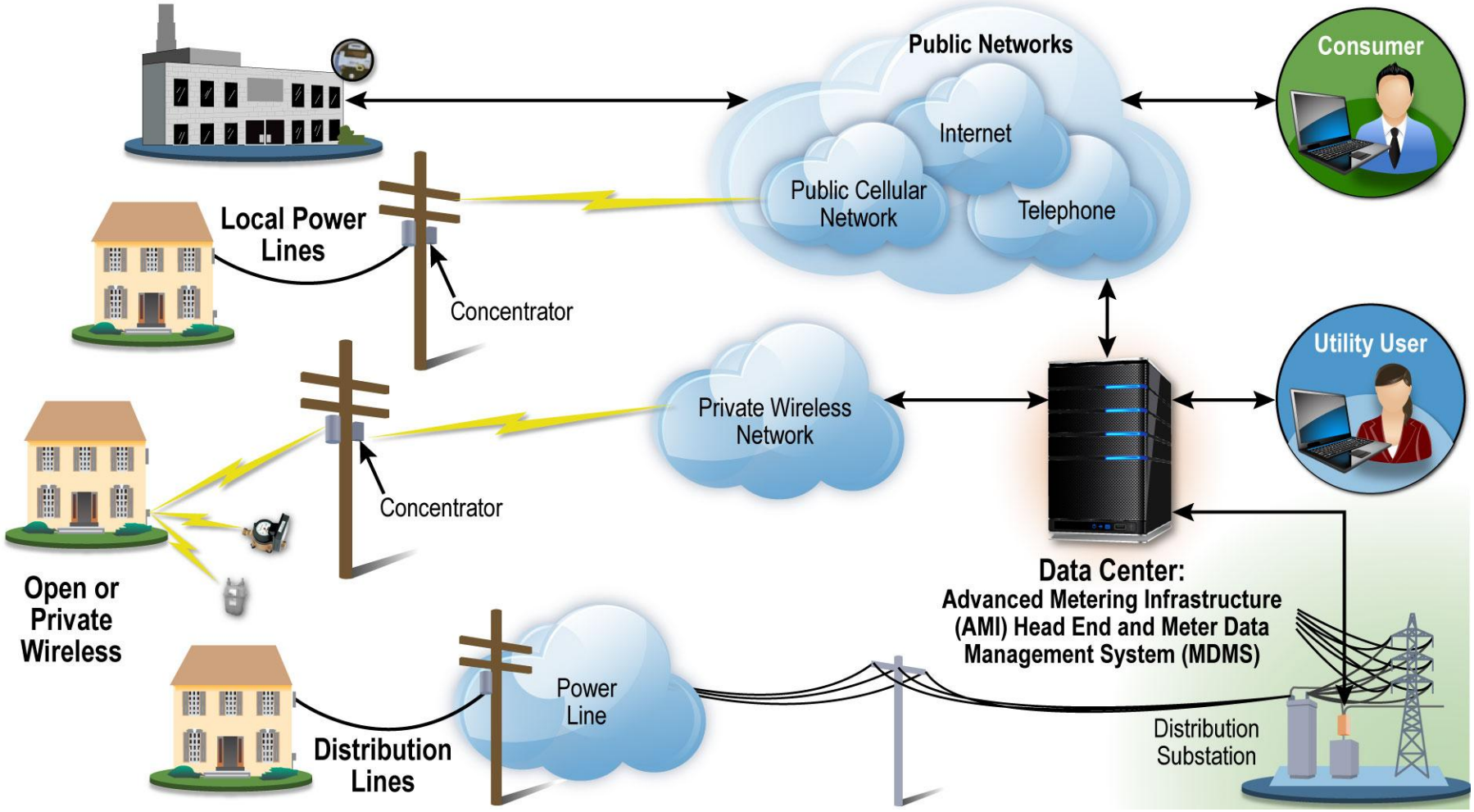
AMI Technologies

- Selection usually driven by communication
  - Metering requirements generally (not always) met by all suppliers
  - Most suppliers abreast of standards for cybersec and interop
- Communication choice drivers
  - Technical requirements
    - Established by business case
  - Supplier requirements
  - Utility risk approach/tolerance
  - Price
  - Subjective relationship factors
- IT issues can be substantial



AMI = *Advanced metering infrastructure*

AMI Communication Alternatives



Business Case Benefits

- Meter accuracy
- Meter reading efficiency
- Billing exceptions—complaints
- Unbilled/uncollectible accounts
- Group accounts
- Cash flow
- Connects, disconnects, and account transfers
- Outage restoration
- Phase balance
- Transformer overloads and sizing
- Vegetation management
- Avoided CO_2 emissions
- Pre-pay

Captured in Business Case for Initial Offering

- Demand response
- Voltage optimization
- Distribution automation
- Distributed energy resources

Future Benefits of Smart Grid Offerings

City Light 2012 AMI Business Case Results

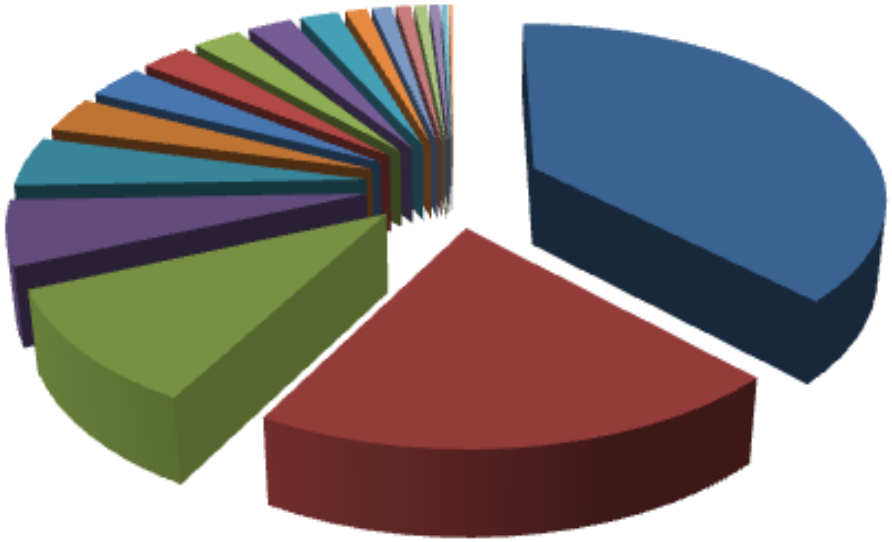
Estimated AMI Costs for City Light

Line Item	Acquisition + Deployment Cost	Annual Operation + Maintenance
AMI Meters ($ thousands)	$60,715	$184
Communication Infrastructure	5,108	549
Master Station & IT Integration	2,739	153
Program Management	1,657	
Operations		1,034
Totals ($ thousands)	$70,220	$1,921
Overall acquisition + deployment cost per meter served = $171.00		

AMI Benefit Categories

Benefit Category	Benefit Examples	Role in City Light AMI Business Case
Traditional Utility Operations	Meter reading, customer service, service on/off, system planning, service restoration management	Included
Distribution Management	Voltage optimization, automated feeder sectionalizing	Omitted
Customer Programs	Demand response, load management, electric vehicles	Omitted
Societal – Economic	Improved regional business climate	Omitted
Societal – Environmental	Long term energy use reductions	Omitted

Estimated City Light AMI Benefits in Traditional Operations



- Meter Reading
- Meter Accuracy
- Cash Flow on Standard Billing
- Billing QA/QC Exceptions - Backoffice
- Meter Replacement & Salvage
- Avoided Transformer Overloads
- Connects, Disconnects, & Acct Transfers - Office Process
- Right-of-Way Maintenance
- Connects, Disconnects, & Acct Transfers - Field Process
- Uncollectible Accounts on Standard Billing
- Unbilled Accounts
- Billing QA/QC Exceptions - Field
- Meter Data - Miscellaneous
- Transformer Loading & Sizing
- Outage Restoration
- Group Accounts
- Billing QA/QC Exceptions - Meter Testing
- Bill Complaints & Questions

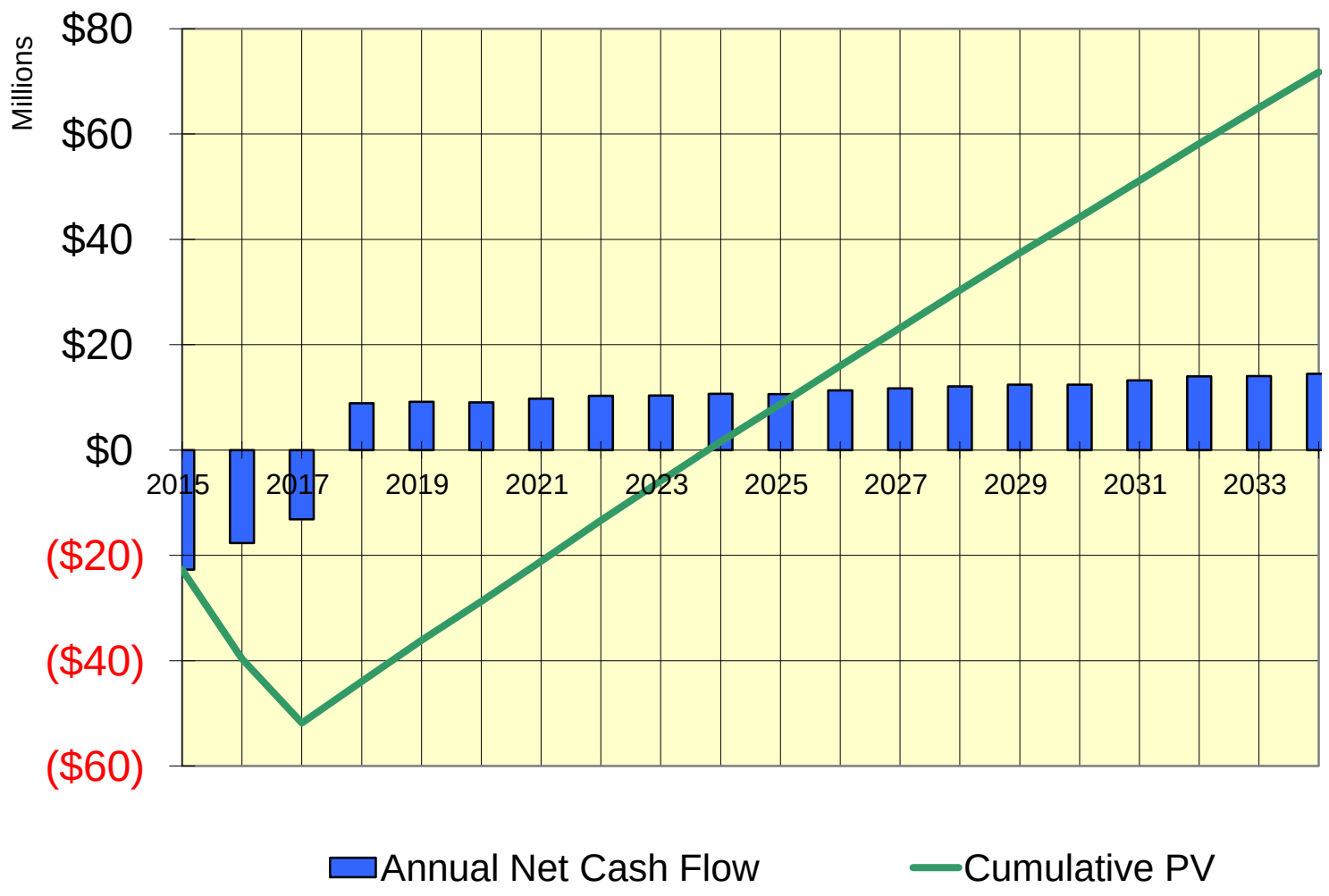
Notes:
- Benefits are shown for the year following deployment completion, after which inflation may affect some more than others.
- Includes benefits in traditional utility operations only
- Benefits of new customer programs and distribution management excluded

AMI Investment Results for City Light

Investment Life:	10 Years	15 Years	20 Years
Net Present Value (NPV)	$1,590,434	$37,422,988	$71,758,123
Internal Rate of Return (IRR)	4.7%	12.3%	14.8%
Cumulative NPV Breakeven Year		2024	

Notes:
- Deployment interval = 3 years
- Includes benefits in traditional utility operations only
- Benefits of new customer programs and distribution management are additional
- Straight line 15-year depreciation of AMI assets
- Weighted average cost of capital = 4.1%
- Annual labor cost inflation = 3%
- Annual meter population growth = 1%

AMI Investment Cash Flow for City Light



Questions/Comments