



Long-term Planning Study

Hibbing Public Utilities Commission

July 11, 2018





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Introduction

- Long-term Viability of the Utility
- Task force supported study of long-term directions
- First Key Step toward HPU's long-term objectives



Background

- Hibbing Public Utilities (HPU) is facing challenges to support the community's energy needs
- LEA/Xcel Power Purchase Agreement has expired
- HPU's objective is to establish a long-term sustainable direction that meets the needs of the City of Hibbing in a manner that remains economically viable with a high degree of reliability
- HPU task force of key stakeholders and experts
- HPU engaged HDR to examine current and anticipated energy needs to develop options for a long-term energy strategy

Key Challenges Facing HPU

- Loss of LEA/Xcel revenue
- General trend of declining customers for electric, steam & water
- Age and poor condition of steam distribution & condensate return
- Significant variability in customer steam demand, and steam/electric balance, results in operational challenges and inefficiency
- Needed capital upgrades ~\$89.5M identified by HPU
- Existing agreements for purchase of fuels & electric power

Project Approach

Establish Operating Principles



Examine Current Utilities



Identify Scenarios



Economic Evaluation

- Long term viability of HPU with reliable and safe service
- Competitive cost of service
- Fuel diversification
- Beneficial impacts to the community
- Unbiased, independent evaluation



Scenario Development



<p><u>Plant Generation Options</u></p> <ul style="list-style-type: none"> • No Electric generation • Focus on Steam, generate coincidental electricity • Maximize electric generation (use all steam turbines) • Various fuel usage options (coal, gas, biomass) 	<p><u>Steam Service Options</u></p> <ul style="list-style-type: none"> • Continue Steam distribution • No Steam distribution • Implement conversion of steam users 	<p><u>Plant Generation Options</u></p> <ul style="list-style-type: none"> • Continue Existing Plant • No Steam Generation • Retire Existing Plant • Construct New Electric Plant • Construct New Cogeneration Plant (Electric and Steam) 	<p><u>Steam Service Options</u></p> <ul style="list-style-type: none"> • Continue Steam distribution without renewal • No Steam distribution • Partial Steam distribution renewal • Complete Steam distribution renewal • Convert steam users
<p><u>Natural Gas Service Options</u></p> <ul style="list-style-type: none"> • Continue gas distribution service • Implement gas conversion program • Upgrade town border station (increased supply capacity) 	<p><u>Electric Distribution Options</u></p> <ul style="list-style-type: none"> • Purchase all external electricity • Improve electric supply reliability • Construct new substation <p><u>Water Distribution Options</u></p> <ul style="list-style-type: none"> • Construct new water treatment plant • Prioritized renewal of existing water infrastructure 	<p><u>Natural Gas Service Options</u></p> <ul style="list-style-type: none"> • Continue gas distribution service • Continue gas reliability improvements 	<p><u>Electric Service Options</u></p> <ul style="list-style-type: none"> • Purchase external electricity • Continue electric reliability improvements <p><u>Water Distribution Options</u></p> <ul style="list-style-type: none"> • Construct new water treatment plant • Prioritized renewal of existing water infrastructure



Scenario Development

- HDR layered options together into focused long-term scenarios in three general categories:
 1. phasing the steam distribution utility or HPU's existing electric generation (or both) out of service,
 2. steam distribution system renewal combined with continued operation of existing assets, and
 3. installing new electric and/or steam generation assets
- Each scenario was developed to be independent from each other

Final Scenarios

Category	Scenario	Description
Base Case	Base Case	Continue current Plant and Utility Sector operations and implement the Capital Improvement Plan
Steam Service Phase Out	Scenario 1 "No Steam"	Complete heating steam distribution utility phase out but continue operation of existing electric generating Plant
	Scenario 2 "No Plant"	Retirement of existing steam/electric Plant and transition to natural gas utility for thermal energy (building heat, hot water heat, etc.)
Steam Service Renewal	Scenario 3 "Steam Renewal"	Retain all heating steam utility with complete steam distribution renewal with modified steam/electric Plant operation
	Scenario 4 "Core Steam"	Retain only Core Commercial District steam utility with partial steam distribution system renewal with modified steam/electric Plant operation
New Generation Assets	Scenario 5 "New Electric"	New electric generating plant with complete phase out of steam-based generation, and steam distribution utility
	Scenario 6 "New Cogen"	New cogeneration plant with partial steam utility phase out and core steam utility support

Economic Data Collection

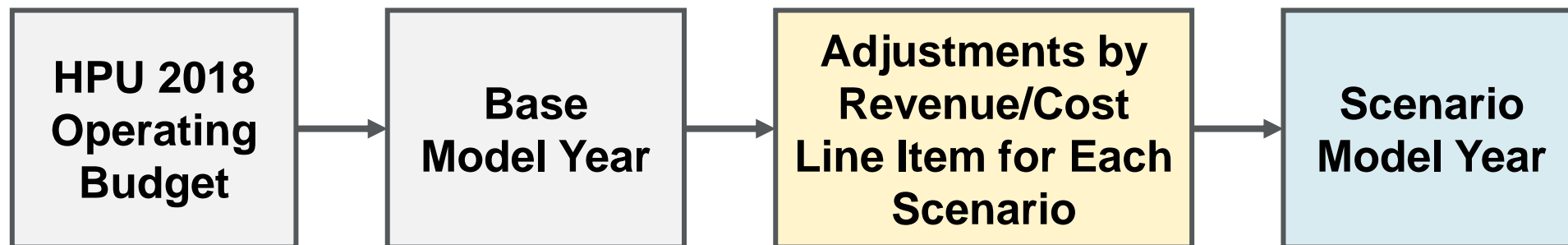
- Collected HPU's historical financial data from the past 10 years and reviewed all ~1200 accounts or cost/revenue line items
- Summarized data into higher level categories to a level of detail needed for the analysis
- Determined that **HPU's 2018 Operating Budget** best served as the basis for the economic modeling
 - Most recent and accurate representation of HPU's current circumstances considering the major changes with LEA
 - Well organized

Economic Model Setup and Model Year

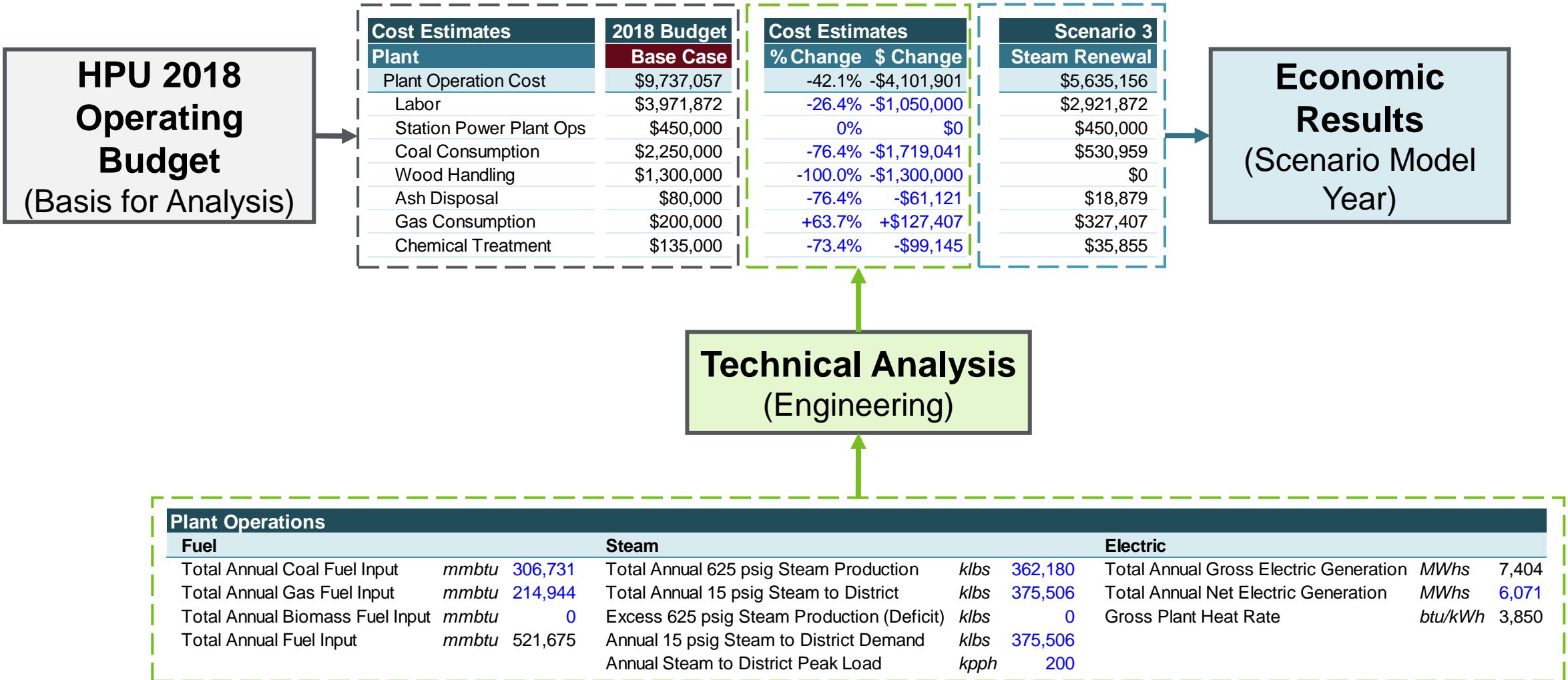
- Analysis developed in the form of a representative “model year” or “test year”
- Assumes **overnight implementation** of each scenario
- Financial results for each scenario represent a **snapshot** of the change in HPU’s annual income given:
 - **HPU’s current conditions**, but
 - **With fully-implemented operating changes** according to each scenario
- Approach allows for an **effective comparison of alternatives on a relative basis** without requiring many additional assumptions

Economic Model Setup and Model Year

- **HPU's 2018 Operating Budget** served as the “model year”
- The model year was then subject to **adjustments** according to the annual financial impacts **for each scenario**



Economic Model Process



Economic Model Assumptions

- No load growth or decline (i.e. 0% load growth) for each of the four utility sectors: electric, steam, water, and gas
- Customer rates were not adjusted from the rates embedded into the 2018 budget
- All major non-operating costs and revenues were applied on an annualized basis to reflect their approximate impact on HPU's annual net income
 - All capital expenditures were levelized over 20 years using a straight line approach, with no financing assumptions
 - The 10-year capital improvement plan was levelized over 10 years
 - The net LEA buy-out proceeds of \$57 million were included as general income and levelized over the 6 year pay-out period

Economic Model Assumptions

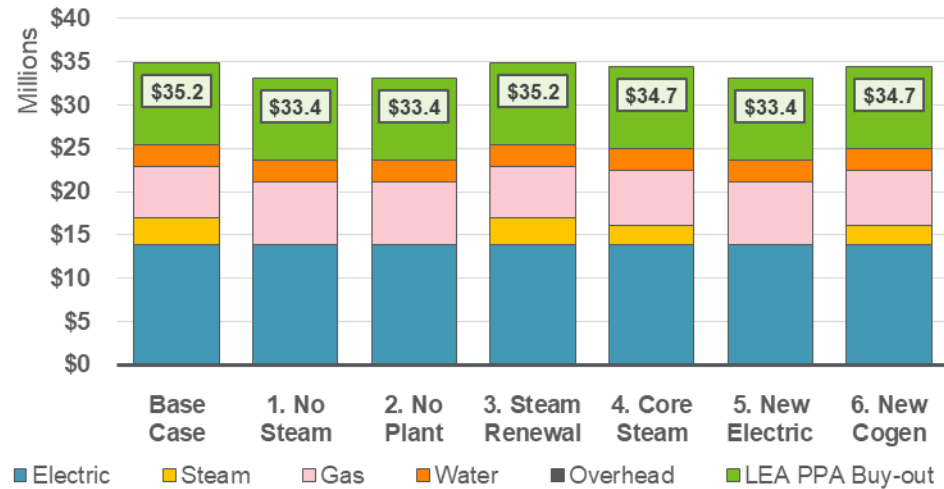
- Analysis **represents**:
 - HPU's current financial position
 - Changes in operations from scenario implementation
 - Direct cash costs in 2018\$ associated with scenario implementation
 - New capital expenses
 - Avoided maintenance expenses
 - Fuel and operation costs, etc.
- Analysis **excludes**:
 - External / unknown factors that would impact all scenarios simultaneously
 - (e.g. load growth/decline, market factors and commodity prices, etc.)
 - Considered through sensitivity analysis to confirm no impact to outcomes on a relative basis
 - Factors related to implementation
 - (e.g. rate changes, financing strategies, timing of investments, etc.)

Economic Model Limitations

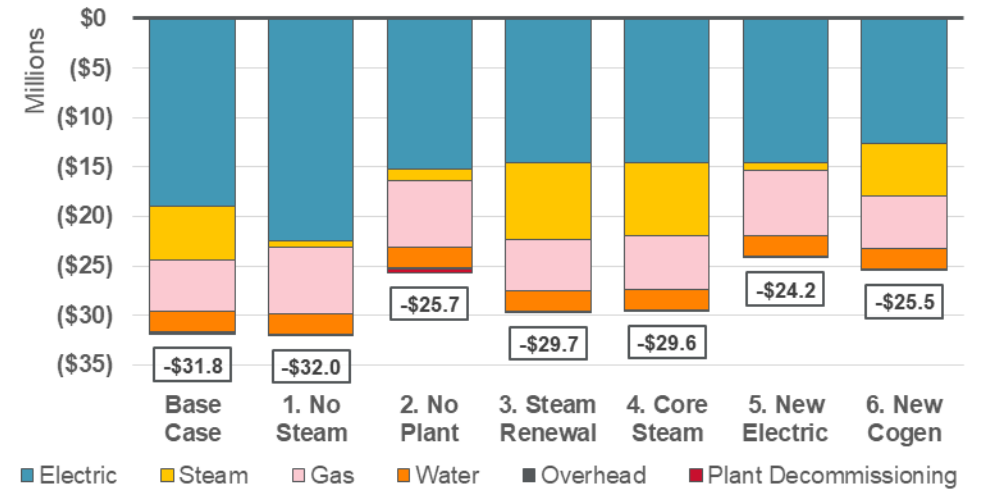
- Analysis is reliable for a **relative comparison between scenarios** and selection of preferred direction
- **Not a forecast of HPU's actual long term financials**
- Excludes many factors that will impact HPU's actual finances
 - Changes in customer loads
 - Macroeconomic factors (cost inflation, tariff impacts on equipment costs, etc.)
 - Accounting requirements (OPEB - retirement obligations, depreciation)
 - Financing options (cash payments, bonds, rate changes, etc.)
- Most of these factors would be studied in more detail and managed during the implementation phase

Model Year Results

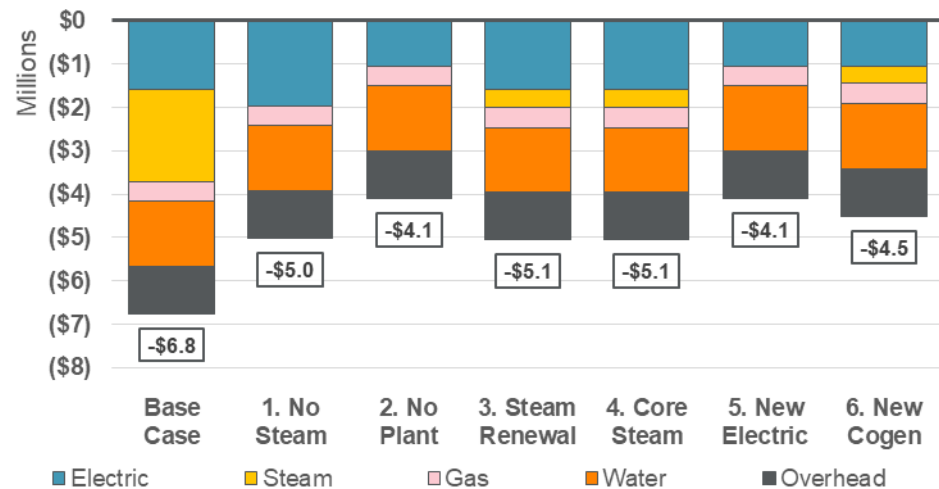
Annual Revenue (2018\$)



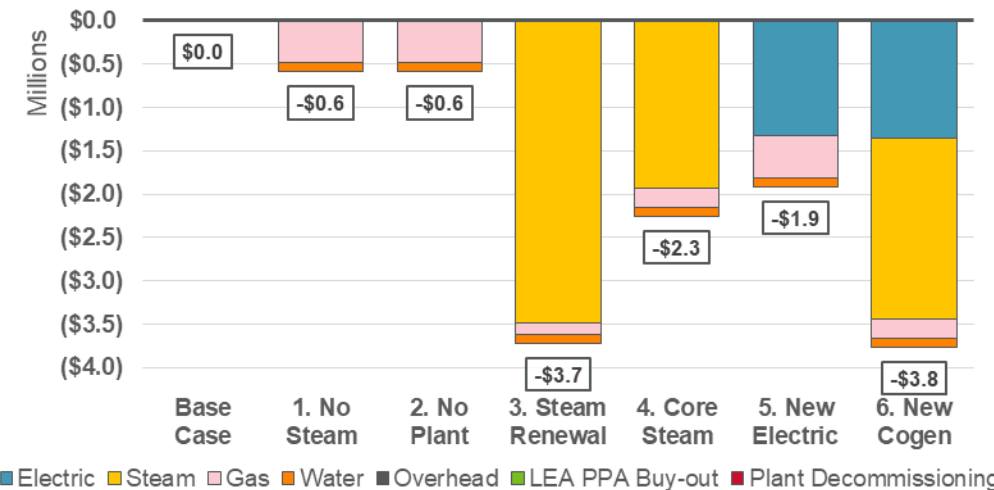
Annual Operating Costs (2018\$)



Annual CIP Requirements (2018\$)

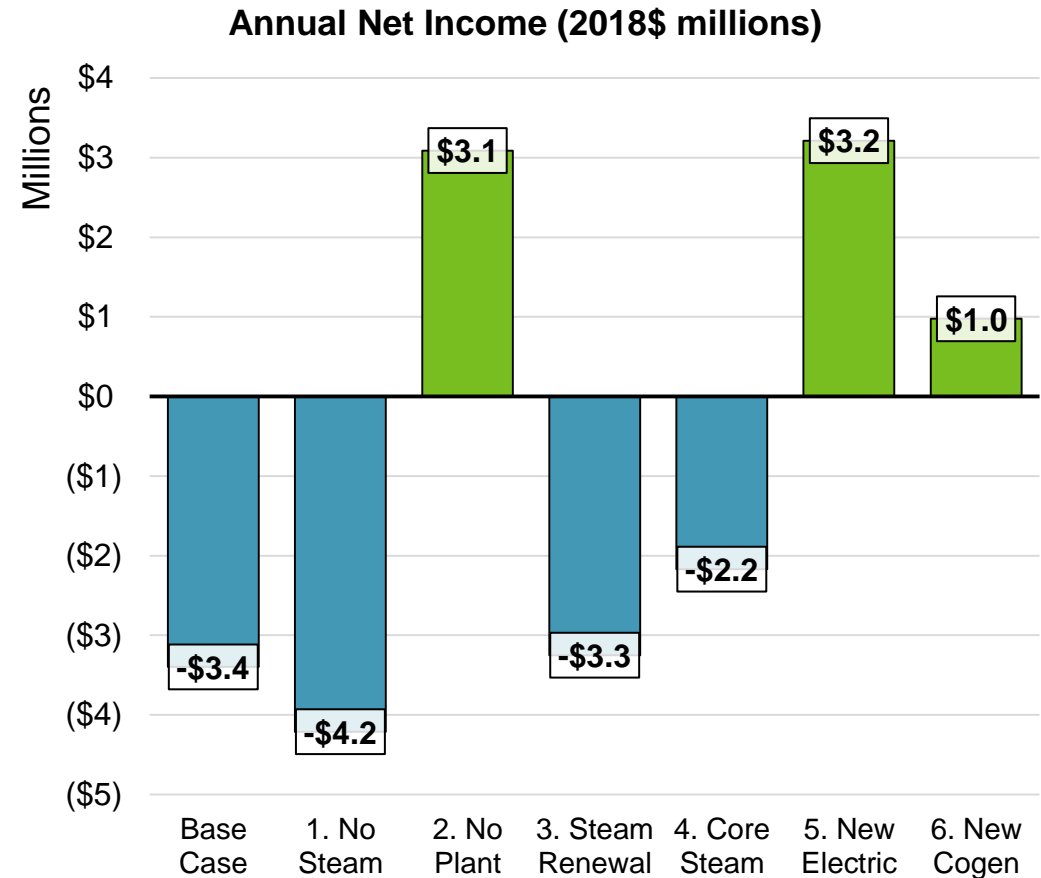


Annualized New Capital Expenditures (2018\$)



Model Year Results / Net Income

- Three of the six scenarios (i.e. scenarios 2, 5 and 6) result in a positive net income
- Scenarios 5 and 6 avoid the Plant CIP spending and replaces it with a more efficient electric and/or steam generating plant
- Scenario 2 avoids the Plant CIP spending and most of the new capital expenditures
- Scenarios 3 and 4 suffer from the high cost of steam distribution system renewal and low steam generation efficiency

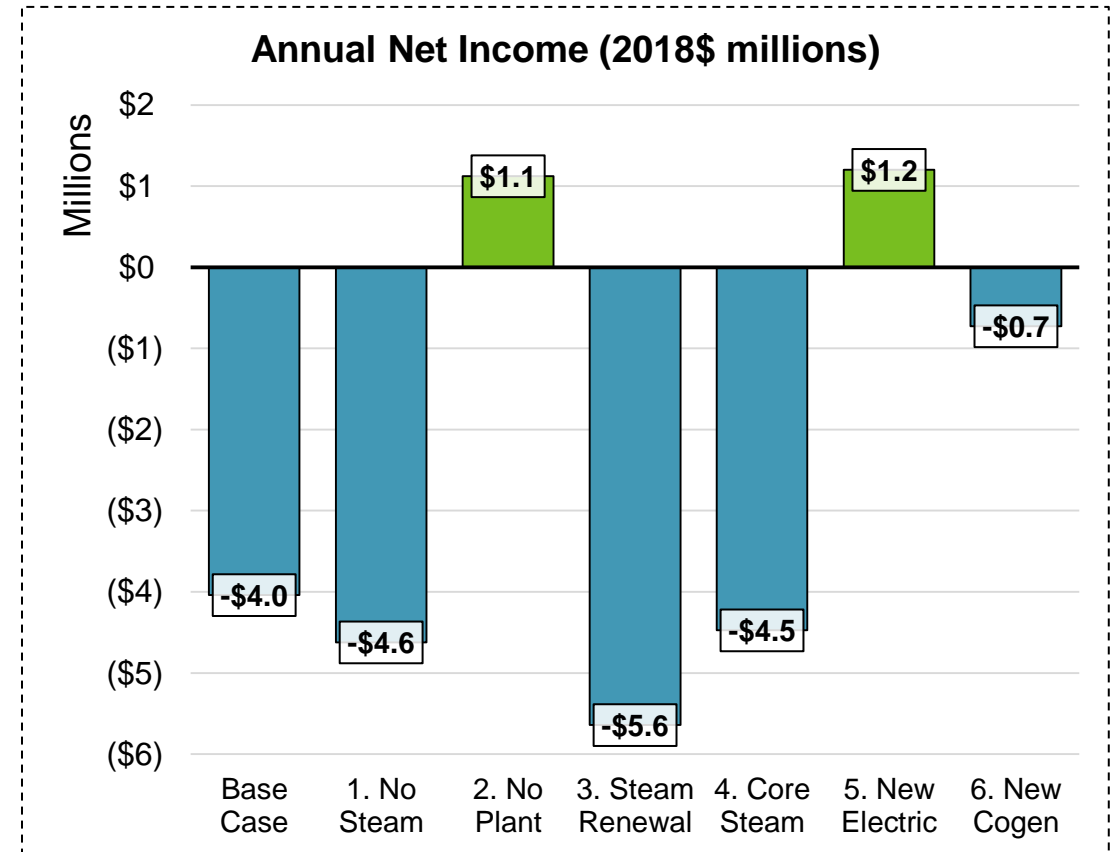


Summary of Results – Benefits/Challenges

Scenario	Description	Annual Net Income (millions)	Benefits & Challenges
Base Case	Continue supplying steam, electric, gas, and water to customers. Continue operation of existing electric generation plant.	-\$3.4 M	B – Maintains Jobs; C – High Operating costs and high steam losses
No Steam	Phase out the supply of steam. Continue operation of existing electric generation plant to supply electric.	-\$4.2 M	B – Maintains Jobs; C – Least Net Income
No Plant	Retire steam and electric plant. Phase out the supply of steam and transition to a natural gas utility resource to supply thermal energy.	+\$3.1 M	B – High Net Income for Least Investment; C – Loss of Jobs
Steam Renewal	Continue to supply steam and implement a complete steam distribution system renewal.	-\$3.3 M	B – Maintains Jobs; C – Highest Capital Investment
Core Steam	Continue supplying the Core Commercial District steam utility. Implement a partial steam distribution system renewal. Modify steam/electric plant operations.	-\$2.2 M	B – Maintains Jobs; C – Significant Capital Investment
New Electric	Phase out using steam-based generation and distribution utility. Create a new, gas-fired electric plant.	+\$3.2 M	B – Highest Net Income; C – Lower Employment
New Cogen	Partially renew the steam distribution system and replace the existing plant with a new, gas-fired cogeneration plant	+\$1.0 M	B – Positive Net Income; C – Requires Significant Investment

Sensitivity Case

- HPU projected annual growth trends by utility sector
- Trends through 2024:
 - Electricity: -3%
 - Steam: -4%
 - Water: -2%
 - Gas: +3%



Step One

Next Steps

Long-term Planning Study

- Task Force Engagement
- Identify Key Principles
- Data Collection / Budget
- Identify Scenarios
- Cost Estimates
- Economic Modeling

Select Preferred Scenario(s)

Qualitative Decision Matrix

- Community Input
- Key Stakeholder Input
- HPUC scoring & weighing

Implementation

- Lifecycle Pro forma
- Evaluate Electric Contract
- Rate Analysis
- Financing Strategy
- Execution Plans
- Capital Expenditure Prioritization

Implementation Early Steps

- Evaluating the contract for purchasing external electric services
- Prioritizing the capital investments and their timelines
- Evaluating the rates and rate structures required to sustain capital investments
- Developing and evaluating potential structures of a gas conversion program to inform scenarios that discontinue steam distribution system operations

HDR