PG&E Test Year 2023 GRC
A.21-06-021
July 15, 2021 Workshop

Tom Roberts

Kevin Flaherty

Carlos Velasquez

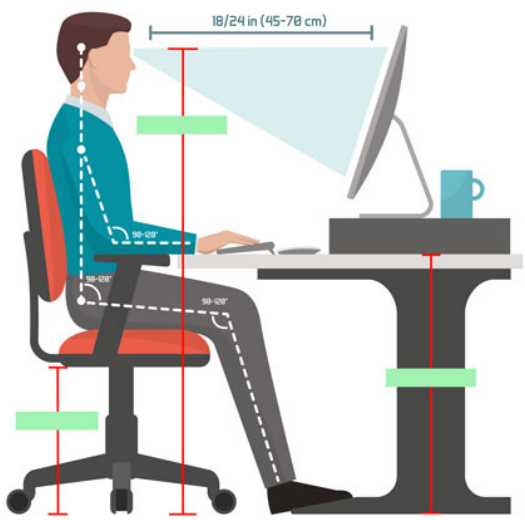
Agenda

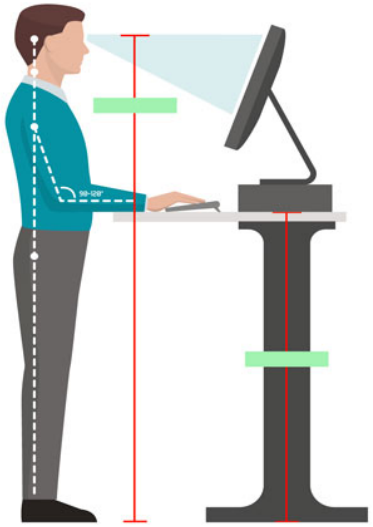
- Logistics
- Energy Division overview of new rate case requirements
- PG&E overview of GRC exhibits and Q&A
  - Topics and timing per the agenda distributed via email
- Next steps

Workshop Logistics

- Online only
  - Please join via Webex if you plan to ask questions
  - Audio through computer or phone
  - Toll-free 1-415-655-0002
  - Access code: 146 344 6778
  - Password: ty2023
- ***This workshop is being recorded***
- Hosts:
  - Energy Division Staff:
    - Tom Roberts
    - Kevin Flaherty
    - Carlos Velasquez
    - Andrew Ngo
  - PG&E: Conor Doyle

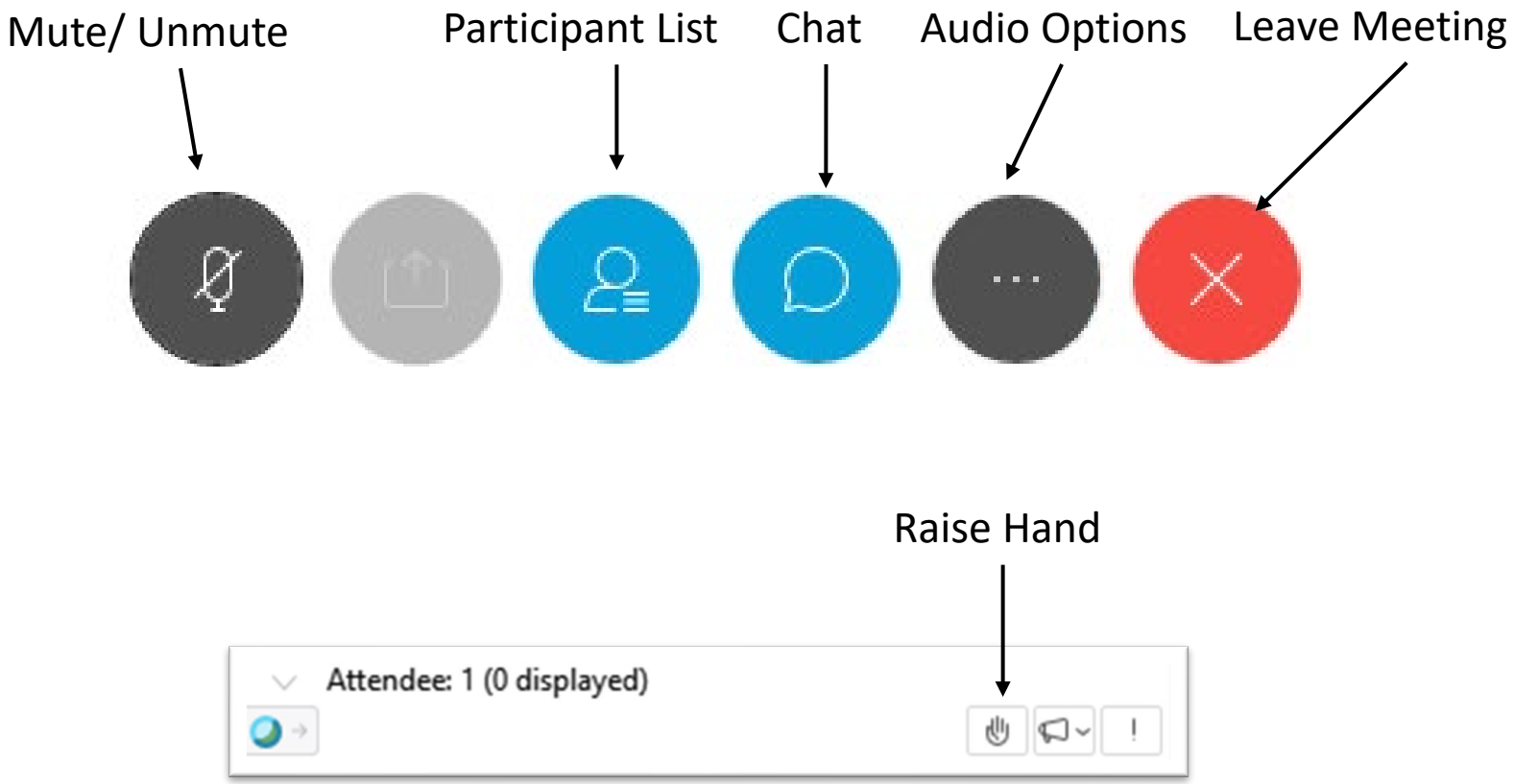
- Safety
  - Note surroundings and emergency exits
  - Ergonomic Check





Workshop Logistics

- Today's presentation and agenda were distributed this morning and will be posted to CPUC website
- Q&A sessions after each section; please review agenda and hold questions for applicable section
- Please submit questions for speakers in the Chat box or raise your hand to be unmuted by host
- CPUC and PG&E staff will try to answer Chat box questions during the presentations, but if not they will be read during the Q&A sessions



CPUC Staff Support for TY 2023 GRC

- Tom Roberts – thomas.roberts@cpuc.ca.gov
  - Case coordinator and primary contact
- Kevin Flaherty - Kevin.Flaherty@cpuc.ca.gov
  - Co-Lead, Gas Transmission and Storage
- Carlos Velasquez - carlos.velasquez@cpuc.ca.gov
  - Co-Lead, Gas Distribution
- Subject Matter Experts (SMEs)
  - Energy Division will work with other CPUC divisions and “OEIS”
  - CPUC Wildfire Safety Division (WSD) is now the Office of Energy Infrastructure Safety (OEIS)

PG&E's TY 2023 GRC is Subject to New CPUC Requirements for Schedule and Content

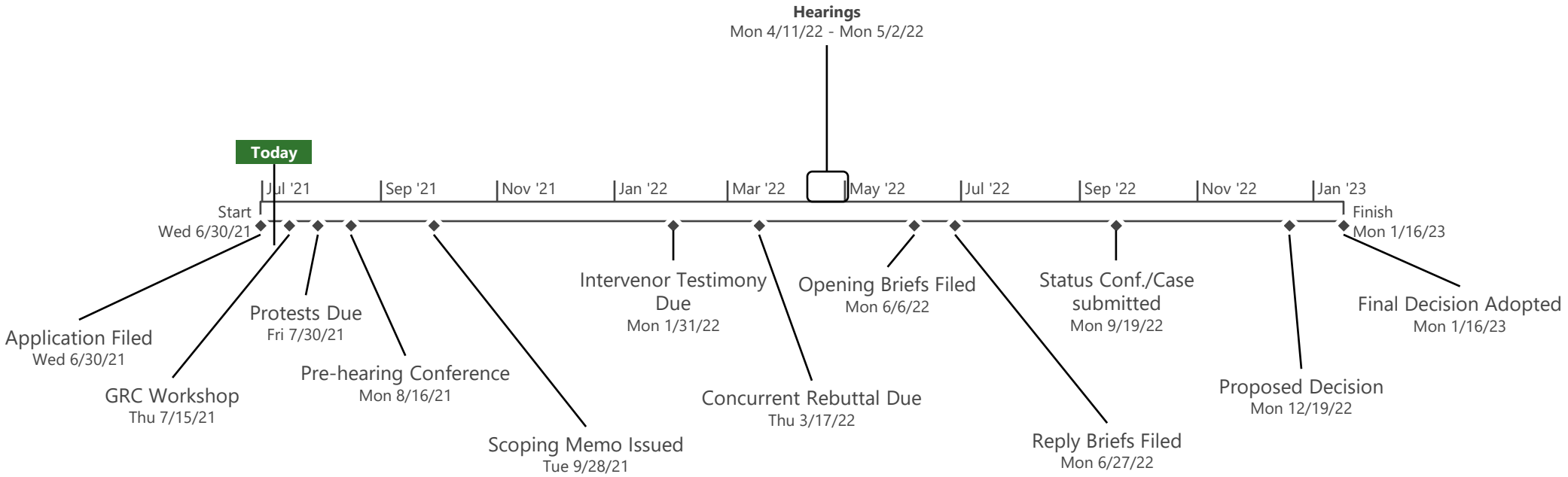
- R.13-11-006 culminated in decision D.20-01-002, which establishes a new schedule and requirements for GRCs which are applicable for the first time for PG&E's TY 2023 GRC, A.21-06-021
  - PG&E's GT&S case is integrated within the GRC
    - Adds scope to the GRC
  - New four-year GRC cycle with three attrition years
    - Adds one additional attrition year to the Post-Test Year (PTY) request
  - Revised schedule for RAMP and GRC applications
    - Transition schedule applicable to PG&E's TY 2023 GRC only (D.20-01-002, Appendix A and B) should provide a final decision in January 2023
    - Final schedule starting with SDG&E and SoCalGas' TY 2024 GRC provides for a final decision before the test year begins (D.20-01-002, Appendix A)

DRAFT Schedule for PG&E's TY 2023 GRC

- D.20-01-002 Appendix A
  - Dates applicable to May 15 filing dates, not PG&E's June 30 filing date
  - Durations shown in days are applicable to PG&E
  - Final schedule to be determined by the ALJ and Assigned Commissioner's Office and provided in the Scoping Memo

Date	Days	Event
Test Year minus-3		
May 15	Day 0	Utility files application to initiate its RAMP proceeding
By September 1	~Day 110	SED files and serve report on utility's RAMP submission.
By November 15	~Day 184	Opening comments on RAMP submission and the SED report
By December 1	~Day 200	Reply Comments
Test Year minus-2		
May 15	Day 0	Utility files GRC application, and serves prepared testimony
By May 30	~Day 15	Utility holds public workshop on overall GRC application
30 days after Daily Calendar notice	~Day 30	Due date for protests and responses to GRC application, pursuant to Rule 2.6(a)
By June 30	~Day 45	Prehearing Conference held
By August 15	~Day 90	Scoping Memo of Assigned Commissioner issued
To be decided		Public Participation Hearings
By December 15	~Day 215	Public Advocates Office and other intervenors serve opening testimony
Test Year minus-1		
By January 30	~Day 260	Concurrent rebuttal testimony served
By February 25	~Day 285	Evidentiary hearings begin
By March 15	~Day 305	Evidentiary hearings end
To be decided		Update testimony and hearings, if necessary
By April 20	~Day 340	Briefs filed
By May 12	~Day 360	Reply briefs filed
By August 3	~Day 445	Status conference, proceeding submitted for Commission decision [Rule 13.14(a)]
By November 1	~Day 535	Proposed decision mailed for comment
By December 1	~Day 565	Final decision adopted
Test Year		
January 1	~Day 595	Effective date of final decision

DRAFT Schedule for PG&E's TY 2023 GRC



Multiple Reports Are Now Available to Inform Parties

- Risk Spending Accountability Report (RSAR)
  - Requirements in D.19-04-020, Attachment 2
  - PG&E filed report on 2020 spending on March 31, 2021
  - Energy Division review of PG&E's 2020 RSAR was issued July 9, 2021
- Safety Performance Metrics Report (SPMR)
  - Requirements in D.19-04-020, Section 3 and Attachment 1
  - PG&E filed report on 2020 metrics on March 31, 2021
  - Safety Policy Division evaluation of PG&E's 2020 SPMR is pending
- Vegetation Management and System Hardening Reports
  - Required per TY 2020 GRC Settlement Agreement adopted in D.20-12-005
  - PG&E filed both reports for 2020 on July 1, 2021 in A.18-12-009
- Gas Transmission and Storage Report (GT&S Report)
  - Requirements in D.19-09-025 (O.P. 83)
  - PG&E filed report on 2020 spending on May 17, 2021

Questions?

Tom Roberts, thomas.roberts@cpuc.ca.gov

PG&E 2023 GRC Workshop

July 15, 2021

Introduction

Objectives

- Provide a high-level overview of PG&E's 2023 GRC
- Provide an informal process to answer questions about the filing

Using Today's Information

- If parties wish to use responses today on the record, please submit a data request to ensure accuracy

PG&E Key Contacts

- Shilpa Ramaiya – GRC Case Manager
- Mary Gandesbery – GRC Lead Attorney
- Conor Doyle – Assistant GRC Case Manager
- Hannah Keller – Discovery Lead

Agenda

Issue Area	Exhibit	Presenter (s)	Start Time	Duration
Energy Division Introduction	NA	Tom Roberts	9:30 AM	15 mins
Case Overview	Exhibit (PG&E-1)	Shilpa Ramaiya	9:45 AM	15 mins
Enterprise Risk Management Program	Exhibit (PG&E-2)	Ken Arnold, Vincent Loh, Kathi Berman, Yumi Oum	10:00 AM	35 mins
Safety Policy	Exhibit (PG&E-2)	Geri Callejas	10:35 AM	15 mins
Operating Rhythm and Climate Resilience	Exhibit (PG&E-2)	Conor Doyle	10:50 AM	10 mins
Morning Break			11:00 AM	10 mins
Administrative and General	Exhibit (PG&E-9)	Lauren Hudson, Brian Pelham	11:10 AM	20 mins
Gas Operations	Exhibit (PG&E-3)	Staci Perata	11:30 AM	30 mins
Lunch			12:00 PM	60 mins
Electric Distribution	Exhibit (PG&E-4)	Kathy Wade	1:00 PM	25 mins

Agenda

Issue Area	Exhibit	Presenter (s)	Start Time	Duration
Electric Distribution, Wildfire Mitigation	Exhibit (Pg&E-4)	Matt Pender	1:25 PM	25 mins
Energy Supply	Exhibit (PG&E-5)	Greg Bosscawen	1:50 PM	20 mins
Customer and Communications	Exhibit (PG&E-6)	Bill Chen	2:10 PM	20 mins
Afternoon Break			2:30 PM	10 mins
Shared Services and Information Technology	Exhibit (PG&E-7)	Geri Callejas	2:40 PM	20 mins
Human Resources	Exhibit (PG&E-8)	Judy Gutierrez	3:00 PM	10 mins
Results of Operations	Exhibit (PG&E-10)	Shetal Chaturvedi	3:10 PM	20 mins
Post Test Year Ratemaking Proposal	Exhibit (PG&E-11)	Anthea Ma	3:30 PM	15 mins
Discovery Overview	NA	Hannah Keller	3:45 PM	5 mins

Big Picture Changes

- Four-year cycle (2023-2026) instead of three
- Wildfire Mitigation Plan (WMP) alignment; last GRC filed in 2018 before WMP existence
- Gas Transmission and Storage (GT&S) incorporated; last GT&S case filed in 2017
- Risk Mitigation and Assessment Phase (RAMP) submitted June 2020 serves as basis for 2023 GRC
- Request for Track 2 and 3 for cost review and recovery

Proposed Schedule with Rate Case

Activity	Date
File GRC application and serve prepared testimony/workpapers	Wednesday, June 30, 2021
Public workshop on overall GRC application	Thursday, July 15, 2021
Due date for protests and responses, pursuant to Rule 2.6(a) (est.)	Friday, August 6, 2021
Reply to protests and responses	Monday, August 16, 2021
Prehearing Conference	Monday, August 16, 2021
Scoping Memo of Assigned Commissioner issued	Tuesday, September 28, 2021
Public Participation Hearings	To be decided
Public Advocates Office and other intervenors serve opening testimony	Monday, January 31, 2022
Concurrent rebuttal testimony served	Thursday, March 17, 2022
Last day to propound discovery	Friday, April 1, 2022
Evidentiary hearings begin	Monday, April 11, 2022
Evidentiary hearings end	Monday, May 2, 2022
File Joint Comparison Exhibit	To be decided
Update testimony if needed	To be decided
Briefs filed	Monday, June 6, 2022
Reply briefs filed	Monday, June 27, 2022
PG&E files track 2 testimony	Friday, July 22, 2022
Status conference, proceeding submitted for Commission decision [Rule 13.15(a)]	Wednesday, September 19, 2022
Proposed Decision issued by	Monday, December 19, 2022

Structure of Exhibits

Line No.	Exhibit	Summary
1	(PG&E-1) "Summary of PG&E's 2023 General Rate Case"	• Provides overall policy testimony on PG&E's request including a summary of PG&E's key updates since the 2020 GRC filing and the 2023 GRC forecast. • Provides an executive summary of the case and revenue requirement forecast. • Outlines the structure of the remaining exhibits.
2	(PG&E-2) "Safety, Risk, and Integrated Planning"	• Present's PG&E's risk management policy, program, and integration of the Risk Assessment and Mitigation Phase into the 2023 GRC request. • Presents PG&E's safety policy and an update on key updates since the 2020 GRC filing. • Presents PG&E's GRC forecast process, new enterprise planning process known as the Operating Rhythm, Customer Affordability, and the Deferred Work showing required by the 2020 GRC Settlement Agreement. • Presents new testimony on PG&E's approach to addressing climate change, including the Company's climate strategy and how climate was considered in preparation of the 2023 GRC forecast.
3	(PG&E-3) "Gas Operations"	• Describes PG&E's policy on managing its gas distribution, transmission, and storage systems, including its risk management program. • Describes the activities and costs incurred in operating, maintaining, and improving its gas assets. • Describes how proposed spending addresses safety-related risks. • Seeks recovery of costs recorded to various GT&S cost recovery accounts.
4	(PG&E-4) "Electric Distribution"	• Describes PG&E's policy on managing its electric distribution operations, including its Community Wildfire Safety Program and Risk Management Program. • Describes the activities and costs incurred in operating, maintaining and improving electric distribution assets. • Describes how proposed spending addresses safety-related risks. • Seeks recovery of costs recorded to the Wildfire Mitigation Plan Memorandum Account (WMPMA) and the Fire Risk Mitigation Memorandum Account (FRMMA) in 2020.

Structure of Exhibits - cont.

Line No.	Exhibit	Summary
5	(PG&E-5) "Energy Supply"	• Describes PG&E's policy on managing its energy supply operations, including its risk management program. • Describes the activities and costs incurred in operating, maintaining, and improving generation assets. • Describes the activities and costs incurred to procure electricity and gas. • Describes how proposed spending addresses safety-related risks. • Seeks recovery of Hydro Operation costs recorded to the FRMMA in the year 2020.
6	(PG&E-6) "Customer and Communications"	• Describes the five newly-created Regional Vice President (RVP) positions. • Describes PG&E's policy on managing its distribution customer service functions. • Describes the activities and costs incurred in providing customer services. • Describes the activities and costs incurred in replacing its Gas AMI modules. • Describes the Communications activities costs previously included in the "Administrative and General" exhibit, Exhibit (PG&E-9). • Seeks recovery of wildfire communications costs recorded to the WMPMA for work performed in the year 2020. • Describes the cost allocation review that was performed of all customer care programs and services.
7	(PG&E-7) "Shared Services and Information Technology"	• Describes PG&E's policies on, and costs relating to, the following: transportation and aviation; safety and health; land and environmental management; materials; corporate security; Corporate Real Estate Strategy and Services (CRESS); geosciences; and sourcing. • Describes PG&E's policy on, and costs relating to, managing its Information Technology (IT) assets and processes, including cybersecurity. • Describes PG&E's Enterprise and Operational Risk Management Department costs previously described in Exhibit (PG&E-9), Chapter 3 and the newly-created Enterprise Data Governance Department costs. • Seeks recovery of Enterprise Safety and Health, CRESS, and Land and Environmental Management costs recorded to the WMPMA in the year 2020.

Structure of Exhibits - cont.

Line No.	Exhibit	Summary
8	(PG&E-8) "Human Resources"	• Describes PG&E's Human Resources (HR) programs, including those related to executive and non-executive compensation, employee benefits, diversity and inclusion, training and hiring. • Includes the methodology relating to, and results of, the Total Compensation Study. • Describes PG&E's costs relating to the Short-Term Incentive Plan and benefits. • Describes PG&E's HR Department costs. • Describes PG&E's methodology for removing compensation of certain officers from the GRC forecast in accordance with the Commission's implementation of Senate Bill 901.
9	(PG&E-9) "Administrative and General"	• Describes PG&E's A&G costs, including Corporate Services department costs, costs of services provided by PG&E Corporation, insurance, claims and other costs. • Presents an alternate self-insurance proposal for excess liability wildfire insurance.
10	(PG&E-10) "Results of Operations"	• Presents the gas distribution, gas transmission and storage, electric distribution, and generation Results of Operations (RO). • Translates the SAP view of costs presented in Exhibits (PG&E-3) through (PG&E-9) to the FERC account view required by the RCP. • Presents other technical cost chapters (e.g., taxes, rate base). • Presents new testimony on cost allocation.
11	(PG&E-11) "Post Test-Year Ratemaking"	• Presents PG&E's proposed mechanism for cost recovery during the attrition years 2024, 2025, and 2026. • Presents the forecast of rate base growth for the attrition years.
12	(PG&E-12) "General Report"	• Presents general information supporting the exhibits 3 through 9 (e.g., escalation rates). • Provides gas and electric rates impact calculations. • Presents a summary of compliance requirements from various CPUC decisions. • Provides a summary of balancing and memorandum accounts. • Presents the costs incurred through December 31, 2020 for the Mobile Home Park Utility Upgrade Program • Presents a master list of acronyms used throughout the case.
13	(PG&E-13) "Statements of Qualifications"	• Presents an index to the case (e.g., by chapter, by witness). • Presents the statement of qualifications for each witness.

Key Changes from 2020 Testimony Structure

Exhibit (PG&E-2), "Risk Management, Safety, Operating Rhythm, and Climate Resilience"

1) Integrated Planning and Affordability Chapter now called Operating Rhythm
2) New Testimony on Climate Resilience

Exhibit (PG&E-3) "Gas Operations"

1) Added GT&S to Various Existing Chapters
2) Added GT&S-Specific Chapters
3) Other Organizational Changes

Exhibit (PG&E-4), "Electric Distribution"

1) New Chapter Added on Electric Distribution Forecast and Investment Planning
2) Reorganization of Wildfire Risk Mitigation Testimony
3) New Testimony on Community Rebuild Program
4) Includes reasonableness review of Wildfire Mitigation Plan Memorandum Account (WMPMA) and Fire Risk Mitigation Memorandum Account (FRMMA) 2020 recorded costs
5) Other Organizational Changes

Key Changes from 2020 Testimony Structure

Exhibit (PG&E-5), "Energy Supply"

1) WMPMA and FRMMA Reasonableness Review of 2020 Recorded Costs

Exhibit (PG&E-6), "Customer and Communications"

1) New Chapter on Regional Vice Presidents
2) New Chapter on Gas Advanced Metering Infrastructure (AMI) Modules
3) New Chapter on Customer Care Technology Projects
4) Communications Department Costs Moved from Exhibit (PG&E-9), Chapter 8
5) WMPMA Reasonableness Review of 2020 Recorded Wildfire Communications Costs

Exhibit (PG&E-7), "Shared Services and Information Technology"

1) New Enterprise Data Governance Department Added to Enterprise Records and Information Management Chapter
2) New Chapter on Geosciences
3) Enterprise Operational Risk Management Department Costs Moved from Exhibit (PG&E-9) Chapter 3
4) Includes Reasonableness Review of Wildfire Mitigation Plan Memorandum Account and Fire Risk Mitigation Memorandum Account 2020 Recorded Costs

Key Changes from 2020 Testimony Structure

Exhibit (PG&E-10), Results of Operations

1) New Testimony on Cost Allocation
2) New Testimony on GT&S Operations and Maintenance Expense
3) Testimony on Customer Deposits Moved
4) Testimony on Software Useful Life Moved

Exhibit (PG&E-12), General Report

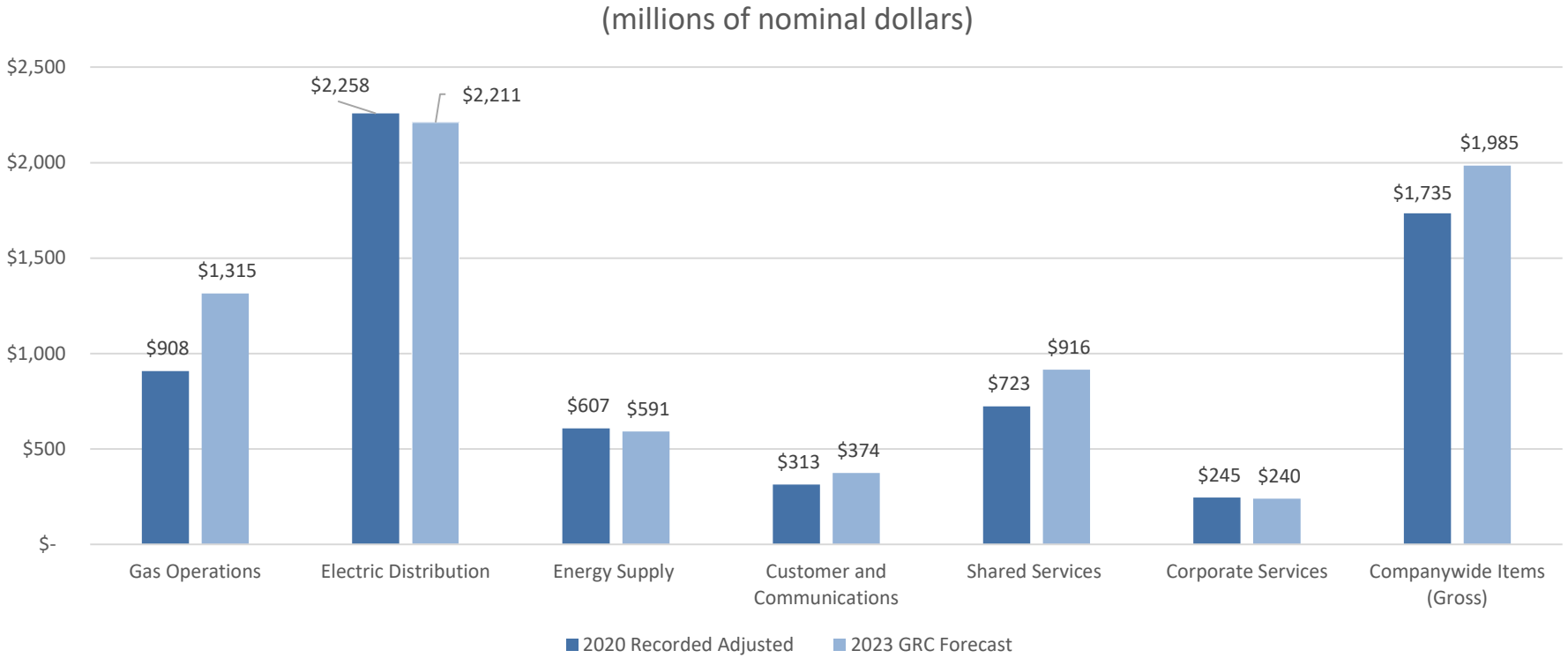
1) Cost Model Chapter Not Included
2) Consolidation of Billings and Sales and Rate Chapters
3) Safety Related Earnings Adjustment Mechanism Chapter Not Included

Key Changes from 2020 Testimony Structure

Potential Updates:

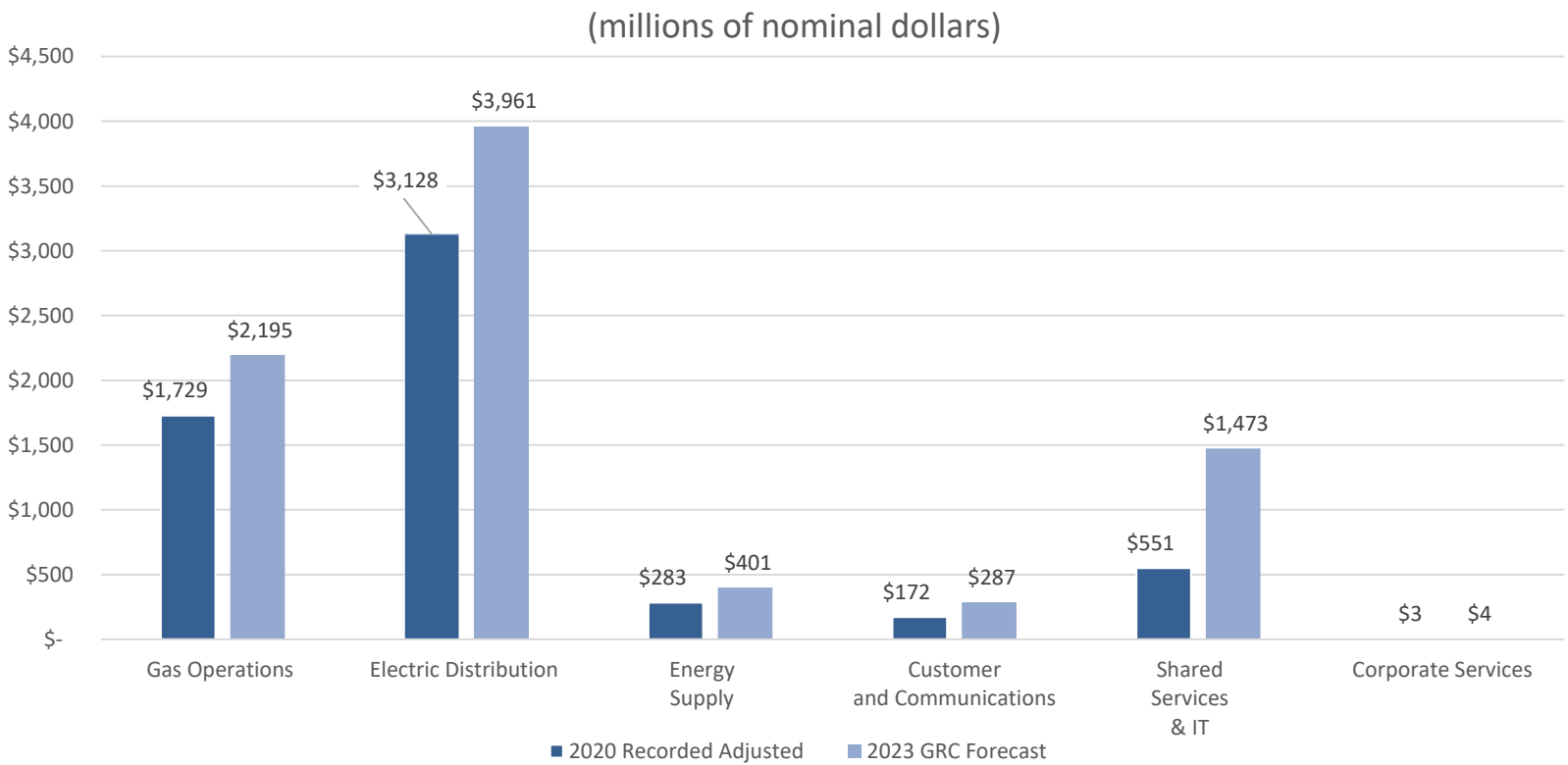
- Supplemental testimony to Exhibit (PG&E-3) on: (1) the capitalization of costs incurred to retest transmission pipelines to comply with federal safety standards consistent with FERC accounting direction; (2) increased gas transmission pipeline integrity management costs due to new PHMSA requirements; and (3) updated forecasts and testimony to reflect the approval by CalGEM on June 15, 2021 of our natural gas storage plan.
- Supplemental testimony to Exhibit (PG&E-7), Chapter 5, Corporate Real Estate, to reflect certain updates regarding the relocation of its general office complex by August 30, 2021

Expense Walk (2020 – 2023)



Total Expense increase from $5.1B in 2020 to $5.7B in 2023

Capital and Related Costs Walk (2020 – 2023)



Total Capital Expenditures increase from $5.9B in 2020 to $8.3B in 2023

Exhibit (PG&E-2) Enterprise and Operational Risk Management, Safety, Operating Rhythm, and Climate Resilience

Enterprise and Operational Risk Management, Safety, Operating Rhythm and Climate Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Enterprise and Operational Risk Management	Sumeet Singh
2	Safety Policy	Francisco Benavides
3	Operating Rhythm	Stephanie Williams
4	Climate Resilience	Heather Rock

Exhibit (PG&E-2) Enterprise and Operational Risk Management

Ken Arnold, Vincent Loh

Risk Policy and Implementation Overview

	Enterprise Risk Chapter	Line of Business Chapters
Overview	Provides an overview of PG&E's risk management philosophy, organizational structure and risk reporting, and how PG&E is transitioning from RAMP to GRC	How individual risks are managed within their own organization, how mitigations and controls are assessed key recommendations from the RAMP.
Contents	• How EORM program is being managed, with a focus on maturing PG&E's data-driven, risk-based decision making to assist with mitigation strategies and to demonstrate risk reduction • Progress made since the 2020 RAMP filing and adoption of SMAP proceeding requirements, such as Multi-attribute Value Function evaluation tool • What efforts are underway to mature company's risk quantification and modeling, new data collection and utilization • Chapter provides the roadmap to risk-related issues through the GRC filing	• How risks and associated mitigations have changed, since the RAMP filing, and how risk spend efficiency calculations have been updated • How SPD and Intervenor recommendations are addressed

PG&E Risk Management Overview

EORM's approach to risk management is based on the ISO 31000 risk management standard and focuses on identifying, evaluating, prioritizing, mitigating, and monitoring risk.

Evolution of Enterprise and Operational Risk Management

Steering Committees & Risk Governance

- Provides guidance & leadership around managing the company's highest safety risks
- Examples of risk governance committees include Wildfire Governance Committee, Public Safety Risk Committee, Climate Resilience Officer Coordination Committee, Risk Management Community

Long-Term Vision of Enterprise Risk and Compliance

- Improving the line of sight from enterprise risks to compliance commitments and related risk mitigations and controls

Risk Management Tools

- Using the Multi-Attribute Value Function (MAVF), bow-tie methodology, and risk spend efficiency (RSEs) scores to evaluate mitigation and control programs
- Continue to engage with stakeholders to improve the risk-based decision-making framework

Improvements to the MAVF

MAVF Updates for the 2023 GRC:

PG&E now calculates RSEs in a manner that allows for a better comparison of mitigations and controls

RSEs in the 2023 GRC include a present value of revenue requirements (PVRR) factor

- Using the Revenue Requirement to calculate Net Present Value (NPV) allows for a direct comparison between RSEs between capital and expense programs.

Introduced a method for qualitatively assessing program effectiveness when no data is available

Information Within The Chapter

- PG&E's Corporate Risk Register is included in testimony and represents 32 risks (including the top 12 risks included in the 2020 RAMP) and 8 cross-cutting factors.
- PG&E catalogued feedback heard from the Safety Policy Division and other parties and provides a response to that feedback.
- Comparison of PG&E's 2020 RAMP cost estimates to 2023 GRC forecasts.
- Cross-cutting factor mapping table which shows how cross-cutting factors impact each risk.

Exhibit (PG&E-2), Safety Policy

Geri Callejas,
2023 GRC Case Manager

Safety Policy Overview

- Safety stand: Everyone and Everything is Always Safe
- Developments Since 2020 GRC
  - Safety leadership: CSO and Regional Safety Directors (Field Safety Operations)
  - Internal Governance: SNO, Public Safety Risk and Safety Technical Council(s)
- 2025 Workforce Safety Strategy
  - Evolution of the One PG&E H&S Plan described in 2020 GRC
  - Safety Systems and Safety Culture
  - Framework for top safety risk mitigations and controls
- Public Safety Leadership
  - Internal and external oversight

Safety Policy Overview: Safety Systems (1 of 2)

Line No.	Strategy Component	Workstreams
1	Critical Risk	• Develop and lead processes to identify hazards, assess risk and issue technical standards
2	Transportation Safety	• Develop and lead motor vehicle safety programs that address vehicle technology, employee and contractor risk, and Department of Transportation compliance
3	Contractor Safety Management	• Run by Critical Risk, provides training, performance requirements, on-boarding; and performance assessment guidance
4	Serious Injury and Fatality Management	• Expansion of program established in 2016; added technology improvements to analyze SIF investigations and share key learnings and SIF-related communications
5	Enterprise Corrective Action Program	• Continue to enhance the program and run safety observations: 1.Expansion and evaluation of technology solution – user adoption, functionality and standards, 2.Corrective Action Program Management, and the 3. Establishment of a Near Hit Program
6	Health & Safety Management System	• Implement the new system in operations via: 1.Leadership and Engagement; 2.Workforce Safety; 3.Management of Change; 4.Performance Improvement and 5. Safety Assurance
7	(Safety) Assurance	• Establish an integrated framework to ensure controls are functioning; major initiatives: 1.Safety Compliance Register; 2.Safety Audit Program; 3.Ext Safety Assessments - Independent Safety Oversight Committee (ISOC) Assessment Execution

Safety Policy Overview : Safety Systems (2 of 2)

Line No.	Strategy Component	Workstreams
8	Occupational Health	• Ergonomics: Office ergonomics; Industrial athlete program; Industrial ergonomics; Vehicle ergonomics; Home ergonomics • Health and Wellness • Injury Management: Live Health Online telemedicine; Condition management (targeting high-risk employees); Onsite clinic strategy; Fit4U program; Return-to-Work Task Bank; Telephonic Nurse Case Management program
9	Field Safety Operations	• Field Safety Specialist skill development • Field observation execution and support • Tailboard/Job Safety Analysis redesign and execution • Supervisor training • Safety Connections facilitation • Safety Action Plans • SIF Incident Evaluation support • Emergency event safety support

Exhibit (PG&E-2), Operating Rhythm and Climate Resilience

Conor Doyle,
2023 GRC Case Manager

Operating Rhythm and Climate Resilience

Chapter 3, Operating Rhythm

Operating Rhythm
- Successor to the Integrated Planning Process (IPP)
- Weekly, monthly, quarterly, and annual forums

GRC Forecast Process
- Primary Objectives:
  - Risk Informed
  - Meet key commitments
  - Consistent with Plan of Reorganization financial targets

Customer Affordability Program Office
- Affordability Efforts
  - Operational Improvements
  - Investment Optimization
  - Transactional

Deferred Work Analysis
- Consistent with 2020 GRC showing

Chapter 4, Climate Resilience
- Expected climate conditions for this GRC period
- Preparing PG&E for climate change
- Incorporating climate in the GRC forecast

Exhibit (PG&E-3)
Gas Operations

Staci Perata

Gas Operations, GRC
Case Manager

2019 Gas Transmission & Storage Integration to 2023 GRC and Cost Allocation and Rate Design (CARD) Separation

Chapter	2019 GT&S Title
1	Gas Transmission and Storage Policy
2	Summary of 2019 GT&S Rate Case
3	Summary of Request
4	Safety, Risk and Planning
5	Asset Family – Transmission Pipe
6	Asset Family – Storage
7	Asset Family – Facilities
8	Corrosion Control
9	Operations and Maintenance
10	Gas System Operations
11	Natural Gas Storage Strategy
12	Gas Operations Technology and Security
13	Other Gas Transmission and Storage Support
14	Plant and Rate Base Depreciation Reserve and Expense Depreciation: Service Life and Net Salvage Estimates
15	Results of Operations Income and Property Taxes
16	Cost Allocation and Rate Design Backbone Load Factor Demand and Throughput Forecast
17	Post Test-Year Ratemaking Proposal Cost Recovery
~~18~~	~~Core Transport Agent Changes~~ N/A
19	Core Gas Supply
20	Cost Model Change

GRC: Phase 1 Gas Operations Exhibit 3	2023 GRC
	Gas Operations

GRC: Phase 1 Other Exhibits	Exhibit	2023 GRC
	1	Summary of Case
	4	Electric Distribution – Field Metering
	6	Customer Care
	7	Shared Services
	10	Results of Operations
	11	Post Test-Year Ratemaking
	12	General Report

RRQ

- GT&S UCC RRQs
- (Exh 10)
- System Capacities/Heating Values/Shrinkage Rates
- (Exh 3)
- Financial and Revenue Factors (Exh 10)

GT&S CARD

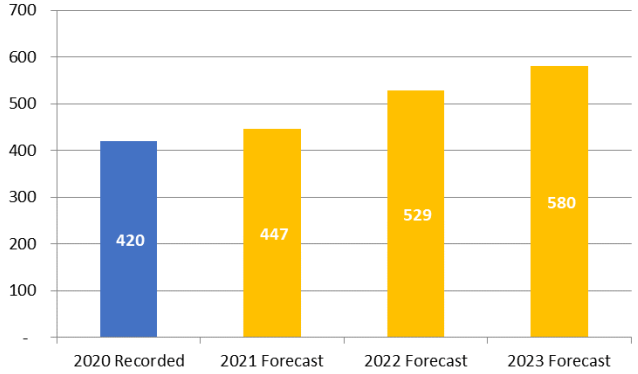
Gas Operations – Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Gas Operations Policy and Introduction	Christine Cowsert
2	Summary of Request and Investment Planning	Thomas Fiore
3	Gas Operations Risk Management	Vince Tanguay
4	Asset Family – Distribution Mains and Services (DMS)	Mike Kerans
5	Asset Family – Transmission Pipe	Bennie Barnes
6	Asset Family – Facilities	Terry White
7	Asset Family – Storage	Lucy Redmond/ Roger Graham (NGSS)
8	Gas Operations and Maintenance (O&M)	Jason Klemm
9	Corrosion Control	David McQuilling
10	Leak Management	Erik Kurtz
11	Gas System Operations (GSO)	Dan Menegus
12	Gas Technology	Darrel Feldman
13	Other Gas Operations Support	Thomas Fiore
14	New Business and Work at the Request of Others (NB/WRO)	Jeff Gravelle

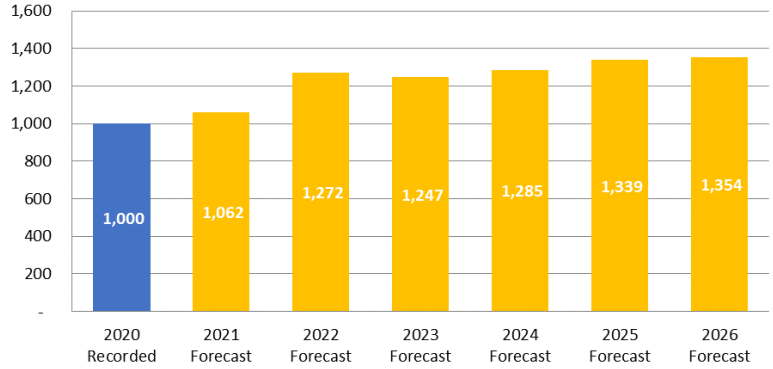
Summary of Gas Operations Forecast Expense and Capital Expenditures

GD Expense

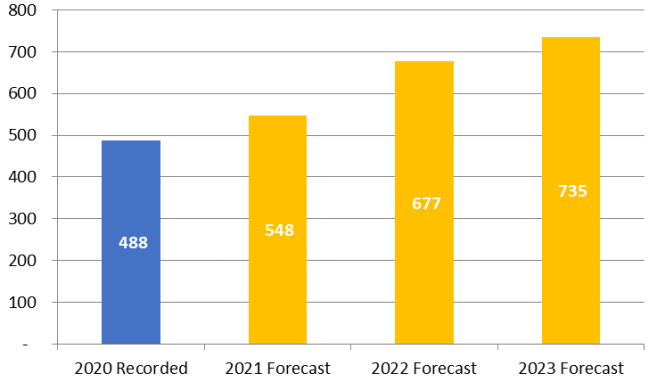
(Millions of Nominal Dollars)



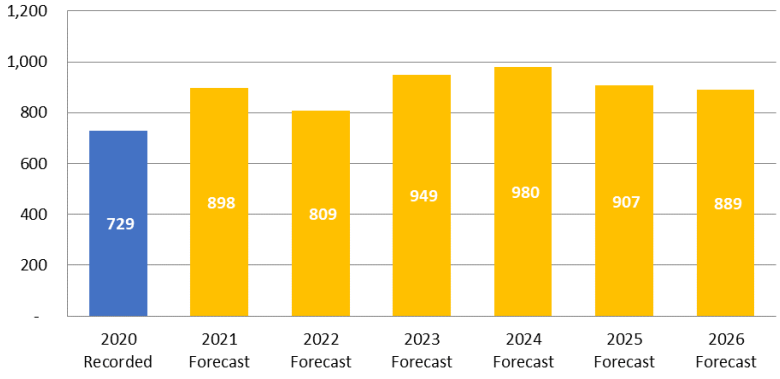
GD Capital



GT&S Expense

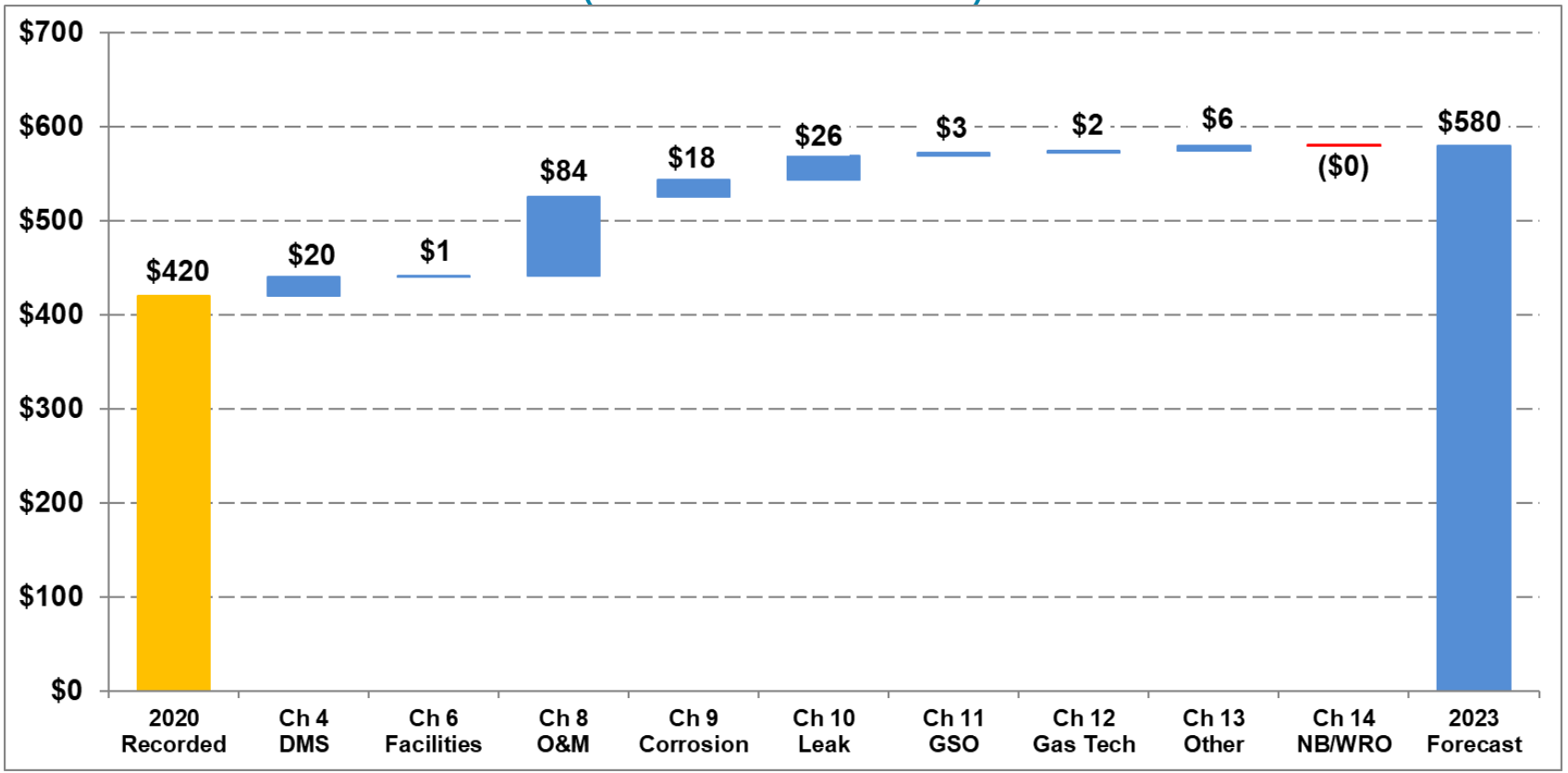


GT&S Capital



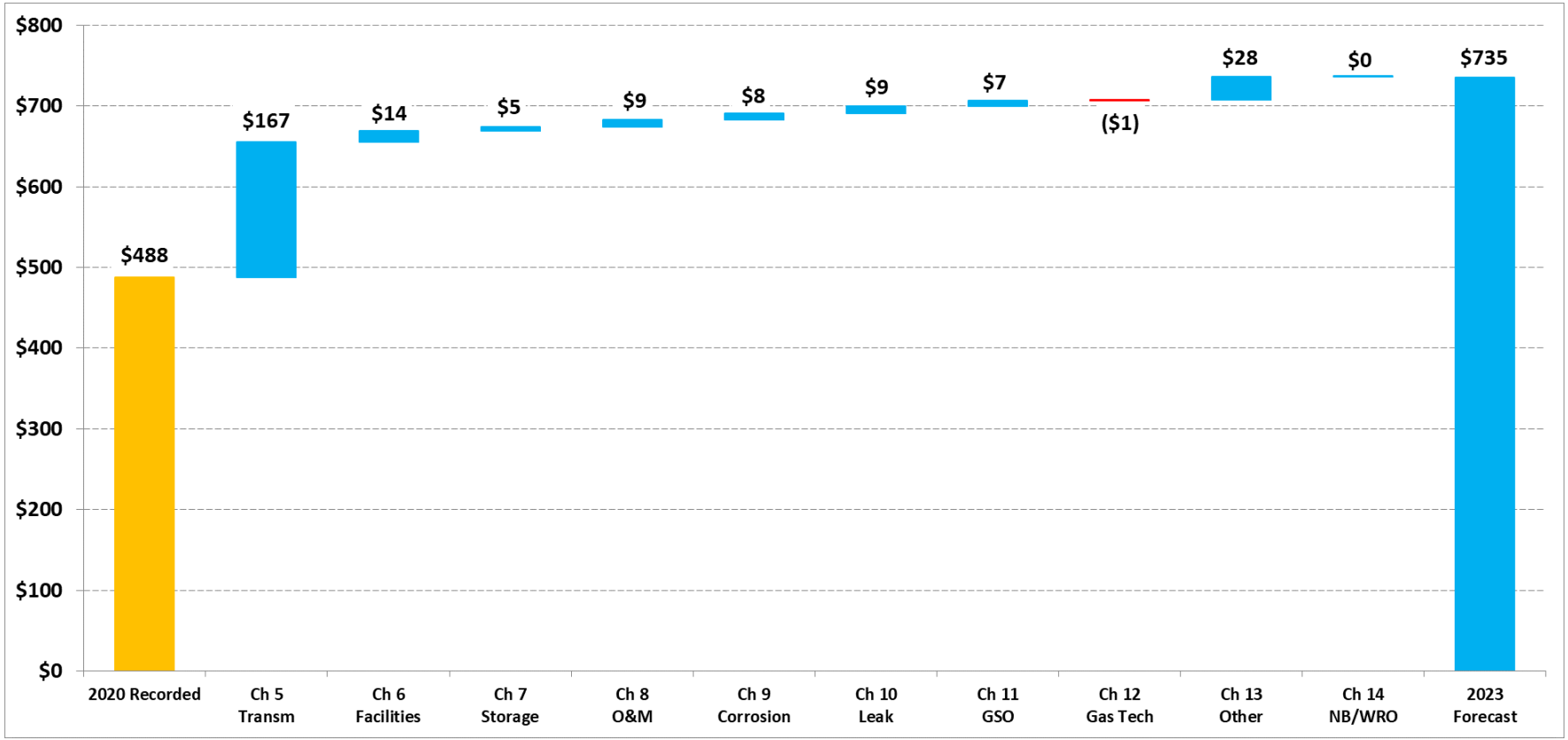
2023 GRC Gas Distribution Expense Walk

(Millions of Nominal Dollars)



2023 GRC Gas Transmission and Storage Expense Walk

(Millions of Nominal Dollars)



Key Cost Changes from 2020 Recorded Expenses

2020 Recorded – $908M; 2023 Forecast – $1,315M; Increase = $406M

Distribution Primary Drivers:

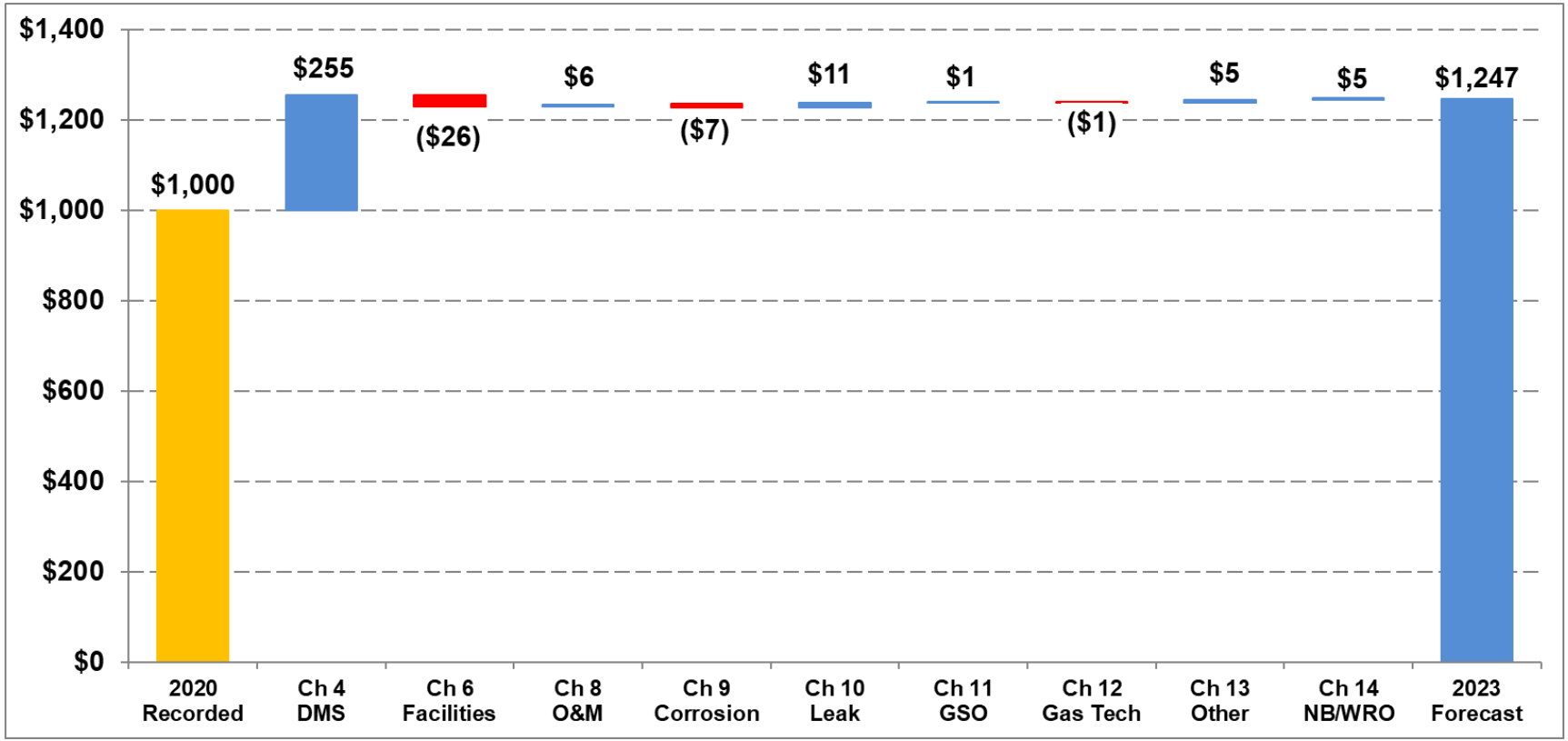
- **Locate and Mark** ($48.5M increase) – 12% year-over-year increase in USA tickets to be worked (Ch.8)
- **Leak Repair** ($25.5M increase) – Below Ground Grade 3 non-hazardous leak repair unit increase (Ch.10)
- **Meter Protection** ($24.0M) – Volume increase including CGIs, customer call ins and AOC locations (new and existing backlog) (Ch.8)

Transmission Primary Drivers:

- **Strength Test** ($72.5M) – Volume increase due to new regulations, improved strength testing forecast curve and lower volume in 2020 due to COVID-19 restrictions (Ch. 5)
- **Direct Assessment** ($54.1M) – Driven by completion of threat assessments required by Subpart O and PG&E's procedures (Ch. 5)
- **In-Line Inspection** ($28.1M) - Driven by regulations and PG&E's procedures to repair anomalous findings from both Traditional and Non-Traditional ILI inspections the year before (Ch. 5)

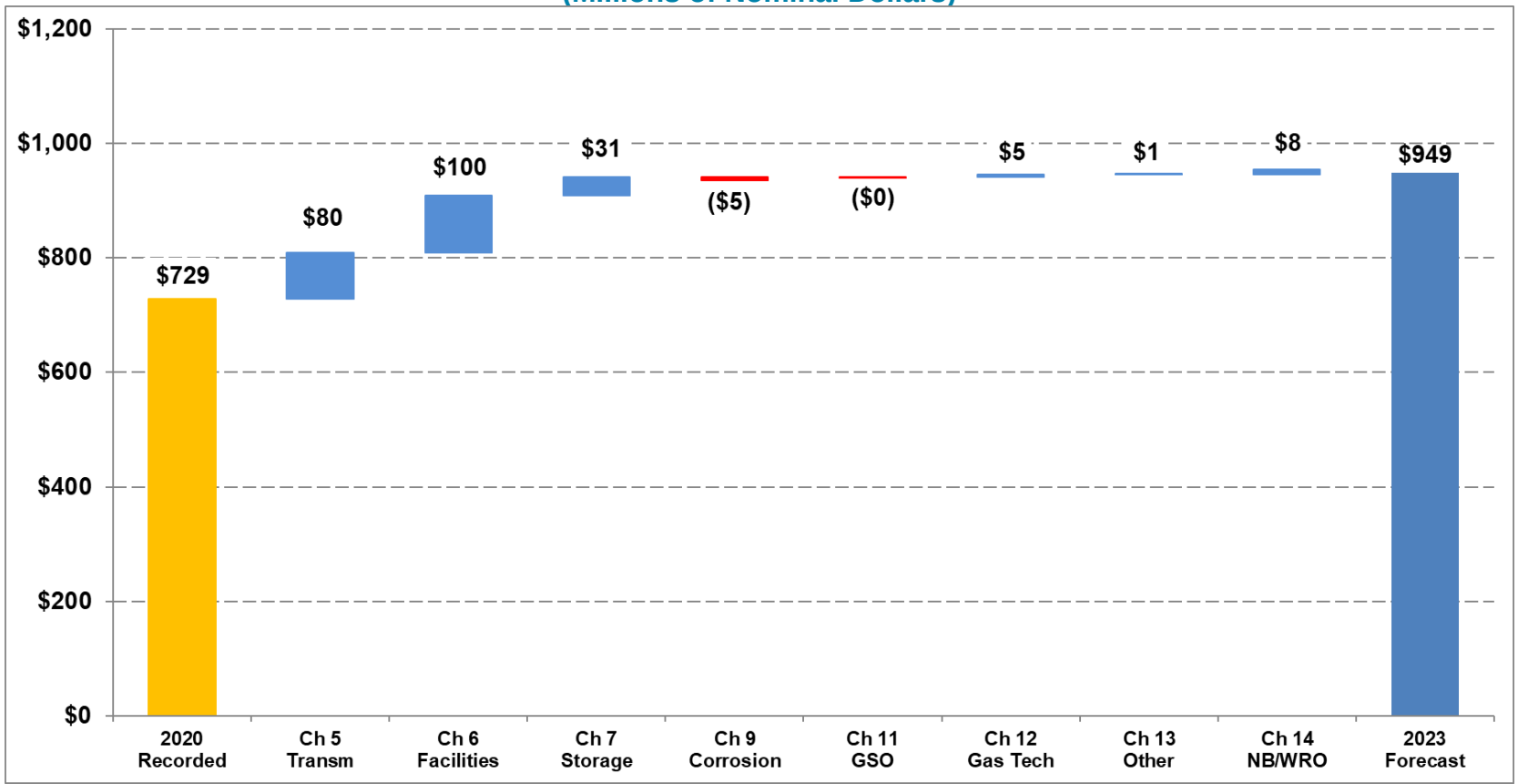
2023 GRC Gas Distribution Capital Walk

(Millions of Nominal Dollars)



2023 GRC Gas Transmission and Storage Capital Walk

(Millions of Nominal Dollars)



Key Cost Changes from 2020 Recorded Capital Expenditures

2020 Recorded – $1,729M; 2023 Forecast – $2,196M; Increase = $466M

Distribution Primary Drivers:

- **Pipe Replacement Programs** ($289.5M) - Forecasting 222.5 miles of main replacement in 2023, including 170.4 miles of plastic pipe, 37.1 miles of steel pipe and 15 miles of reliability pipe). (Ch.4)

Transmission Primary Drivers:

- **Strength Test** ($74.3M) - Increased volume and use of new capital pipe replacement cost forecast curve (Ch.5)
- **Well Retrofits** ($32.0M) - Well retrofit/conversions required to meet CalGEM regulations; remainder of well conversions will occur in 2023 and 2024 (Ch.7)
- **GT Station Overpressure Protection (OPP) Enhancements** ($27.6M) - Increase in scope due to Large Volume Customer Meters and Simple Station retrofits (Ch.6)

RAMP Risks in 2023 GRC

RAMP Risk	2023 TY Baseline Risk Score	2026 Mitigated Risk score	2023-2026 GRC Forecast – Cap	2023-2026 GRC Forecast – Exp	Total
Loss of Containment on Gas Transmission Pipeline (LOCTM)	234	181	$2,317M	$2,486M	$4,803M
Loss of Containment on Gas Distribution Main or Service (LOCDM)	84	66	$3,665M	$1,316M	$4,981M
Large Overpressure Event Downstream of Gas M&C Facility (LRGOP)	12	9	$967M	$283M	$1,250M

Notes:

- Forecasts represent total cost of both mitigations and controls used to calculate the RSEs in the risk models.
- Some mitigations or controls may address more than one risk. In these instances, the risk reduction is aggregated between both risks for RSE calculations, and the same forecast may be included in more than one risk model. However, the forecast is only included once for cost recovery purposes.

Comparison of RAMP and GRC Mitigation Forecasts

RAMP Risk	2020-2026 RAMP Estimate Capital	2020-2026 GRC Forecast Capital	Difference Capital	2020-2026 RAMP Estimate Expense	2020-2026 GRC Forecast Expense	Difference Expense
LOCTM	$1,704M	$2,598M	$895M	$498M	$735M	$237M
LOCDM	$4,719M	$4,597M	$(121M)	$292M	$332M	$40M
LRGOP	$418M	$588M	$170M	$59M	$27M	$(20M)

Key Differences Between RAMP and GRC

- LOCTM – Cost changes include the addition of two capital MATs and one expense MAT to the Non-TIMP Strength Testing Program (M003) and an increase in costs for the Traditional ILI Upgrade mitigation (M005).
- LOCDM – Capital cost changes include a reduction of $159M for Steel Pipeline Replacement program (M001) and the addition of $49M for the new Copper Services Replacement mitigation (M007). Expense cost changes include additional forecast amounts for all three expense mitigations: Enhanced CP Survey and Unprotected Main Evaluation (M003), Fitting Mitigation Program (M008) and Cross Bore Sewer Project (M006).
- LRGOP – Capital cost increases include additional costs for GT Overpressure Protection (M002), GD Overpressure Protection (M003) and the HPR Program (M005). Reduced expense amounts include lower costs for the Critical Documents Program (M004).

Incorporating Feedback from RAMP

In the GRC, PG&E has calculated more RSEs for its mitigation and control programs and has also added additional tranches to some of its Enterprise Risk models.

RAMP Risk	RAMP Mitigations with RSE	GRC Mitigations with RSE	RAMP Controls with RSE	GRC Controls with RSE	RAMP Tranches	GRC Tranches
LOCTM	6	7	0	33	4	4
LOCDM	6	6	1	21	12	34
LRGOP	6	6	0	9	6	7

Other Requests – GT&S Cost Recovery

PG&E requests that the recorded costs through 2020 for the following accounts be found reasonable, and that PG&E can recover these costs in rates. The 2021-2022 costs will be requested for recovery in 2023 GRC Tracks 2 and 3, respectively.

Note: RCAMA, RCPMA, CGMA were also subject to reasonableness review but have a zero balance.

Account Name	Expense/ Capital	Type of Account	Proposal	Total Amount $ in '000s
TIMP Memorandum Account	Expense	Memo Account ($0 Adopted)	Close/Retain *(dependent on TIMPBA modification)*	$466
Gas Statutes Regulations and Rules Memorandum Account	Both	Memo Account ($0 Adopted)	Retain	$1,064 expense
ILI Memorandum Account	Both	Memo Account (Above Adopted)	Close	$67,268 expense
ICDA Memorandum Account	Expense	Memo Account ($0 Adopted)	Close	$8,997
Critical Documents Program Memorandum Account	Expense	Memo Account ($0 Adopted)	Close	$11,541
M&C Station Over Pressure Protection Memorandum Account	Capital	Memo Account ($0 Adopted)	Close	$28,744
Gas Storage Balancing Account	Both	Two-Way	Retain	$10,945 expense $143,728 capital
Line 407 Memorandum Account	Capital	Memo Account ($0 Adopted)	Retain	$8,907
Dairy Biomethane Solicitation Memorandum Account	Expense	Memo Account ($0 Adopted)	Close	$67

Exhibit (PG&E-4)
Electric Distribution

Kathy Wade

GRC Case Manager,
Electric Distribution

Electric Distribution – Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Electric Distribution Policy and Introduction	Debbie Powell
2	Electric Distribution Forecasting and Investment Planning Management	Tatjana Rmus
3	Electric Distribution Risk Management	Paul McGregor
4	Wildfire Risk Mitigations	Matt Pender
4.1	Situational Awareness and Forecasting	Ben Almario
4.2	PSPS Operations	Shawn Holder
4.3	System Hardening, Enhanced Automation, and PSPS Impact Mitigations	Mark Esguerra
4.4	Community Wildfire Safety Program PMO	Matt Pender
4.5	Information Technology for Wildfire Mitigations	Tahir Paroo

Electric Distribution – Exhibit Structure

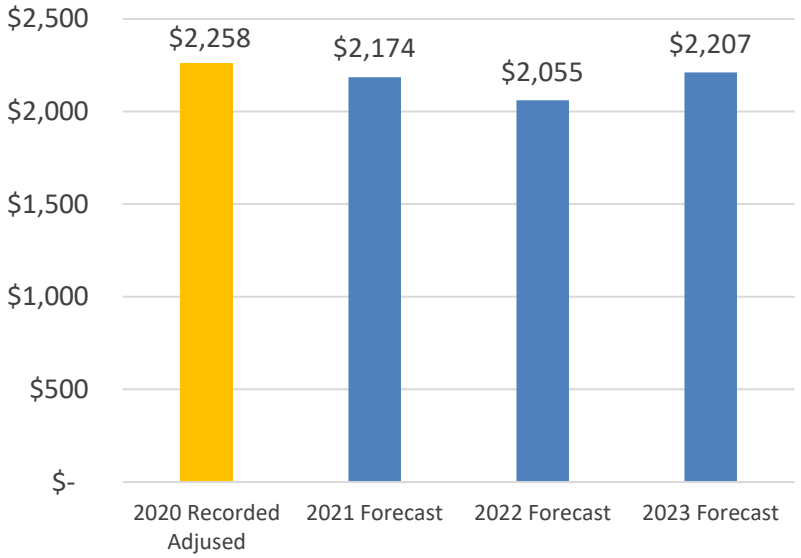
Chapter No.	Chapter Name	Witness
5	Emergency Preparedness and Response	Angie Gibson
6	Electric Emergency Recovery	Marcus Wendler/Angie Gibson
7	Distribution System Operations	Kari Chester
8	Field Metering	Craig Kurtz
9	Vegetation Management	Kamran Rasheed
10	Overhead and Underground Electric Asset Inspections	Mark Esguerra
11	Overhead and Underground Electric Distribution Maintenance	Trish Fabris
12	Pole Asset Management	Jeff Borders
13	Overhead and Underground Asset Management and Reliability	Jeff Borders
14	Network Asset Management	Jeff Borders

Electric Distribution – Exhibit Structure

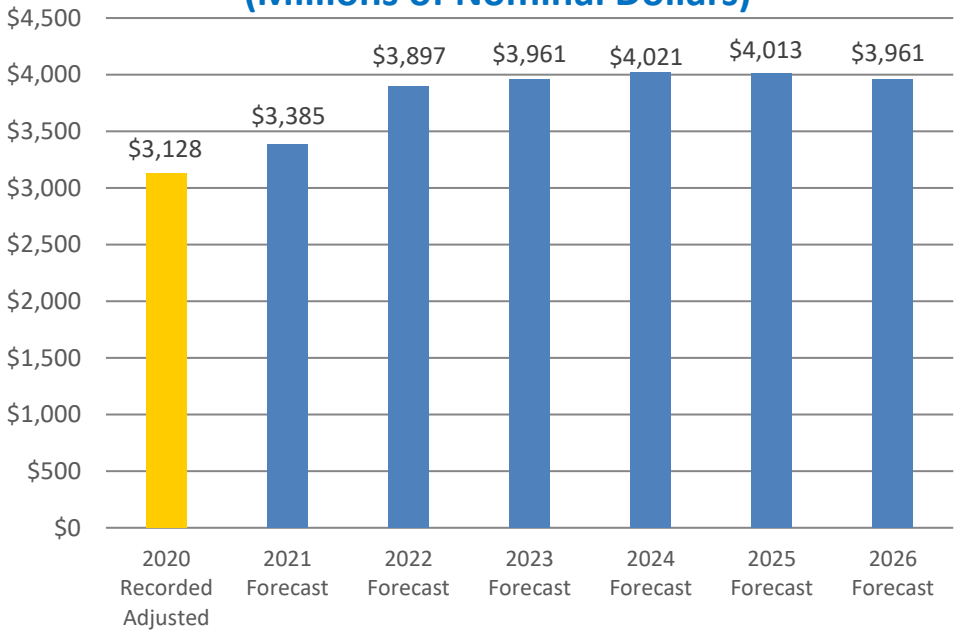
Chapter No.	Chapter Name	Witness
15	Substation Asset Management	Maria Ly
16	Distribution System Automation and Protection	David Carroll
17	Electric Distribution Capacity, Engineering, and Planning	Satvir Nagra
18	New Business and Work at the Request of Others	Josh Jones
19	Rule 20A	Tamon Norimoto
20	Electric Distribution Data Management and Technology	Jadwindar Singh
21	Integrated Grid Platform and Grid Modernization Plan	Elaine Reusing/Quinn Nakayama
22	Electric Distribution Support Activities	Tatjana Rmus
23	Community Rebuild Program	Marcela Fox

Summary of Electric Forecast Expense and Capital Expenditures

Expense (Millions of Nominal Dollars)

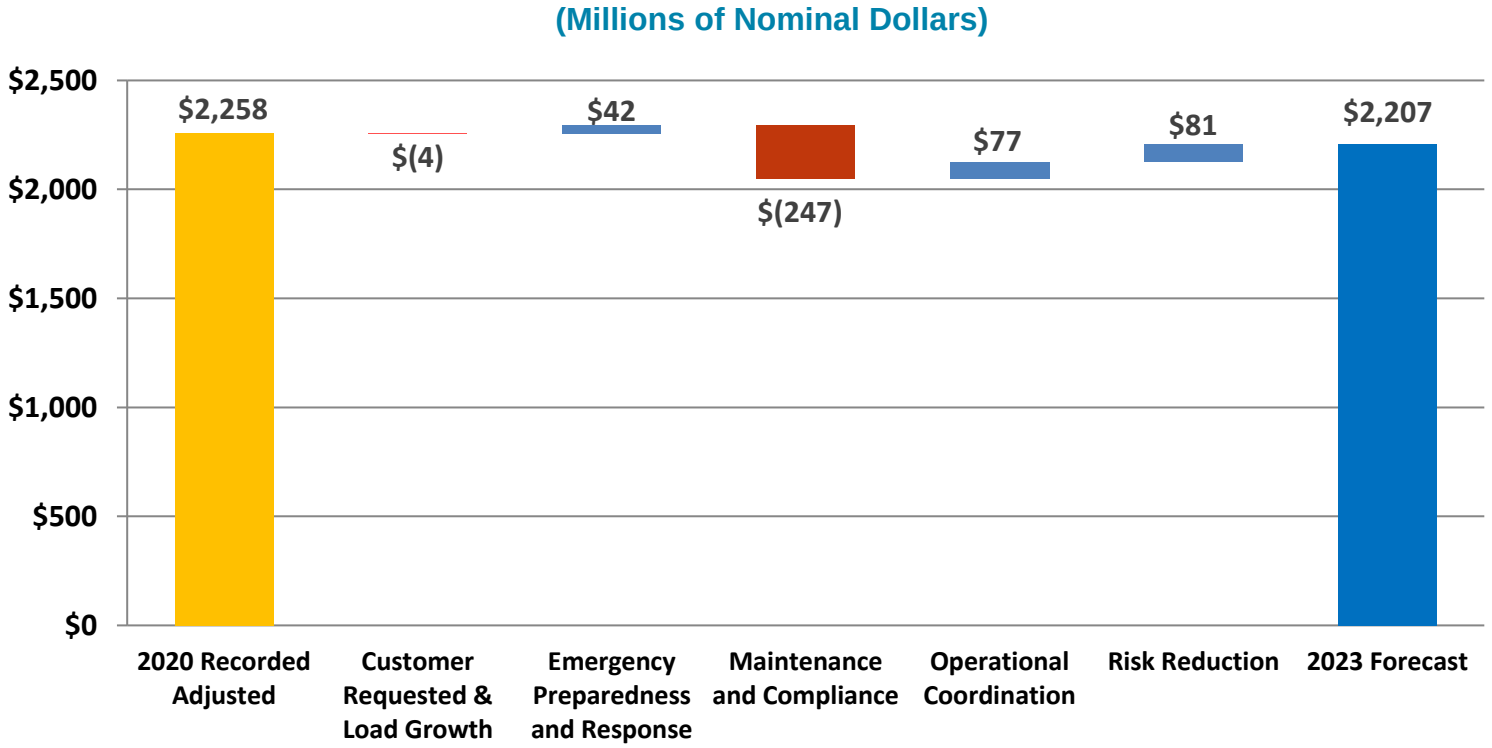


Capital (Millions of Nominal Dollars)



Expense and capital amounts for 2020-2022 include work tracked in memorandum accounts and other separately funded programs which will be rolled into the GRC starting in 2023, shown for trending purposes.

Electric Distribution Expense Walk



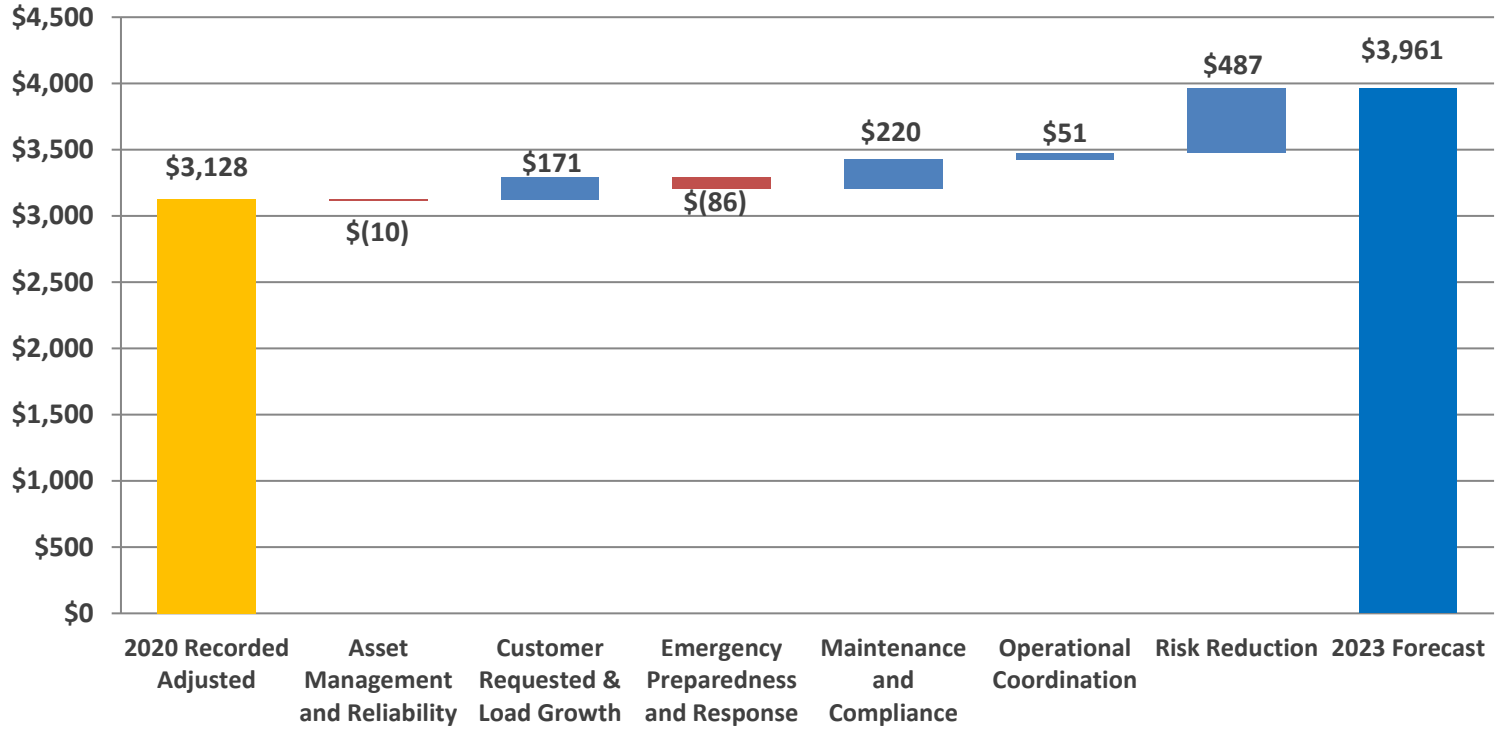
Key Cost Changes from 2020 Recorded Expenses

2020 Recorded – $2,258M; 2023 Forecast – $2,207M; Decrease = $51M

- **Maintenance and Compliance ($247M decrease)**
  - Routine Vegetation Management (VM) savings from a new contracting strategy and a reduction from the number of trees worked in 2020 (Ch. 9)
  - Detailed overhead asset inspections lower costs as a result of moving to a risk-informed approach for scheduling inspections (Ch. 10)
- **Risk Reduction ($81M increase)**
  - Addition of staff for safety oversight and quality work verification for Enhanced Vegetation Management (Ch 9)
  - Technology investments to support wildfire mitigations (Ch 4.5)
  - Expanding PG&E's Safety and Infrastructure Protection Team (Ch 4.1)
- **Operational Coordination ($77M increase)**
  - Increased work in Integrated Grid Platform and Grid Modernization (Ch. 21)
  - Inclusion of a new Data Management and Analytics program (Ch. 20)
  - Increased headcount to support the Regulatory Compliance and Quality Assurance group and other EO work (Ch 22)
- **Emergency Preparedness & Response ($42M increase)**
  - Wildfire mitigation activities such as the Wildfire Safety Operations Center moving out of the Wildfire Mitigation Balancing Account starting in 2023 (Ch. 5)
  - New forecast for straight time labor costs associated with Catastrophic Event Memorandum Account (CEMA)-eligible events in the GRC (Ch. 6)

Electric Distribution Capital Walk

(Millions of Nominal Dollars)



Key Cost Changes from 2020 Recorded Capital Expenditures

2020 Recorded – $3,128M; 2023 Forecast – $3,961M; Increase = $833M

- **Risk Reduction ($487M increase)**
  - Increases in System Hardening program (Ch. 4.3)
  - Undergrounding for the Community Rebuild Program in Butte County (Ch. 23)
- **Maintenance and Compliance ($220M increase)**
  - Significant increase in the volume of pole replacements resulting from the enhanced inspection criteria initiated in 2019 (Ch. 12)
  - Replacement of non-communicating gas SmartMeter™ modules (Ch. 8)
- **Customer Requested and Load Growth ($171M increase)**
  - Projected increase in demand for new residential customer connections and the inclusion in the GRC forecast of some Electric Vehicle (EV) charging infrastructure costs that were historically covered by customers or recovered in other proceedings (Ch. 17)
  - Capacity upgrades driven by the new applications for service and EV charging applications (Ch. 18)
- **Operational Coordination ($51M increase)**
  - Increased investments in the Advanced Distribution Management System to support PG&E's Integrated Grid Platform (Ch. 21)
- **Emergency Preparedness & Response ($86M decrease)**
  - Lower costs for the Distribution Substation Emergency Equipment Replacement Program due to the completion of capital wildfire-related projects (Ch. 15)
  - Decrease in emergency costs for the Community Rebuild program (Ch. 23)
- **Asset Management and Reliability ($10M decrease)**
  - Conclusion of milestone payments to the Elkhorn Battery Energy Storage System Engineering, Procurement, and Construction vendor (Ch 21)
  - Offset by increased replacement rates in in overhead conductor and underground cable (Ch. 13) and substation circuit breakers (Ch. 15)

RAMP Risks in 2023 GRC

RAMP Risk	2023 TY Baseline Risk Score	2026 Mitigated Risk score	2023-2026 GRC Forecast – Cap	2023-2026 GRC Forecast – Exp	Total
Wildfire (WLDFR)	23,033	18,449	$7.0B	$6.4B	$13.4B
Failure of Electric Distribution Overhead Assets (DOVHD)	539	519	$6.7B	$5.7B	$12.4B
Failure of Electric Distribution Network Assets (DNTWK)	17	13	$183.3M	$21.3M	$204.5M
Emergency Preparedness and Response (EPNDR) – Cross-Cutting Factor	N/A	N/A	$22.0M	$110.6M	$132.6M

Notes:

- Forecasts represent cost of total mitigations and controls used to calculate the RSEs in the risk models.
- Some mitigations or controls may address more than one risk. In these instances, the risk reduction is accounted for in both risks for RSE calculations, and the same costs may be included in more than one risk model. However, the costs are only included once in the GRC forecast.

Comparison of RAMP and GRC Mitigation Forecasts

RAMP Risk	2020-2026 RAMP Estimate Capital	2020-2026 GRC Forecast Capital	Difference Capital	2020-2026 RAMP Estimate Expense	2020-2026 GRC Forecast Expense	Difference Expense
WLDFR	$6.1B	$6.4B	$0.3B	$6.8B	$5.2B	$(1.6B)
DOVHD	$5.3B	$5.8B	$0.5B	$3.8B	$3.9B	$0.1B
DOVHD – Pilot Control (Enhanced Inspections)	N/A			$1.2B	$0.5B	$(0.6B)
DNTWK	$131.0M	$126.0M	$(5.0M)	N/A		
EPNDR	$1.8M	$13.0M	$11.2M	$16.7M	$23.7M	$7.0M

Key Differences Between RAMP and GRC

WLDFR

- In the 2020 RAMP, the PSPS mitigation included temporary generation; the 2023 GRC does not.
- Transmission activities were included in the 2020 RAMP but are excluded from the GRC.

DOVHD

- The 2020 RAMP estimate is based on 2019 work completed under the WSIP to inspect all HFTD assets on an accelerated basis. The GRC forecast is based on the on-going Overhead Inspections Program, which significantly reduces the forecast number of inspections and costs in a single year.

Incorporating Feedback from RAMP

In response to feedback received in RAMP, PG&E is providing additional RSEs for its mitigations and controls in the GRC and has also added more tranches to its enterprise risk models.
Similar to RAMP, RSEs were not calculated for foundational programs. PG&E has added RSEs where possible.

RAMP Risk	RAMP Mitigations with RSE	GRC Mitigations with RSE	RAMP Controls with RSE	GRC Controls with RSE	RAMP Tranches	GRC Tranches
WLDFR	6	17	0	22	8	40
DOVHD	5	13	1	15	5	6
DNTWK	3	4	0	4	3	6
EPNDR	2	2	0	0	N/A	N/A

Balancing and Memorandum Account Requests

Account Name	Expense/ Capital	Type of Account	Proposal
Wildfire Mitigation Balancing Account	Both	Two-Way with Reasonableness Review Threshold	Retain and increase reasonableness review threshold from 115% to 125%
Vegetation Management Balancing Account	Both	Two-Way with Reasonableness Review Threshold	Retain and increase reasonableness review threshold from 120% to 125%
Catastrophic Events Straight-Time Labor Balancing Account (CESTLBA)	Both	New Two-Way	Create new two-way balancing account to recover straight-time labor costs associated with CEMA-eligible events in the GRC
Major Emergency Balancing Account	Both	Two-Way	No Change
Rule 20A Balancing Account	Both	One-Way with Carry-over	No Change
Fire Risk Mitigation Memorandum Account (FRMMA)	Both	Memo Account ($0 Adopted)	Find 2020 recorded costs reasonable to recover in rates: $6M expense, $41k capital
Wildfire Mitigation Plan Memorandum Account (WMPMA)	Both	Memo Account ($0 Adopted)	Find 2020 recorded costs reasonable to recover in rates: $65M expense, $326M capital

Electric Distribution Wildfire Risk Overview

Exhibit (PG&E-4)

Matt Pender

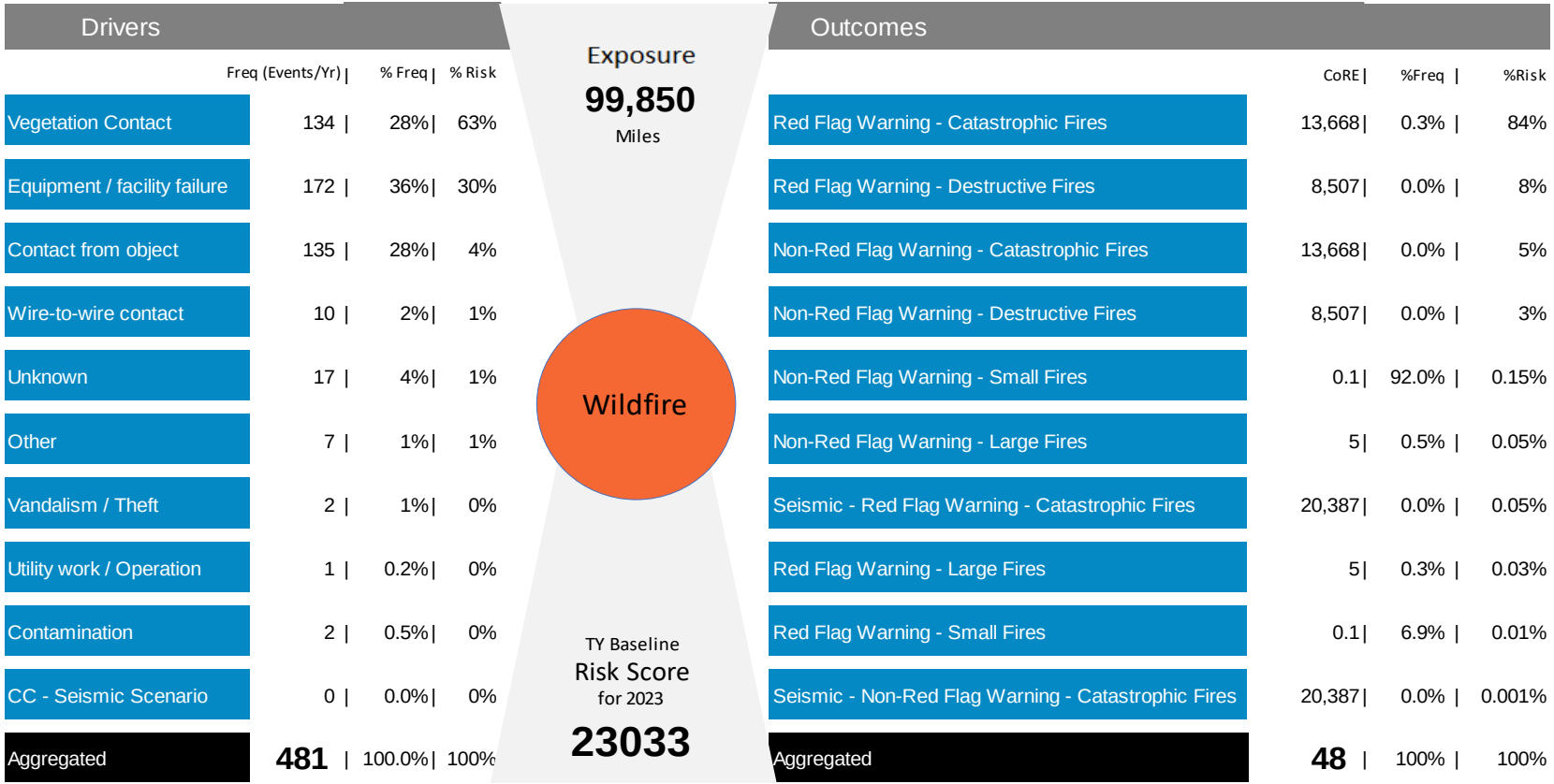
Director, Wildfire Work Delivery

Wildfire Risk Modeling

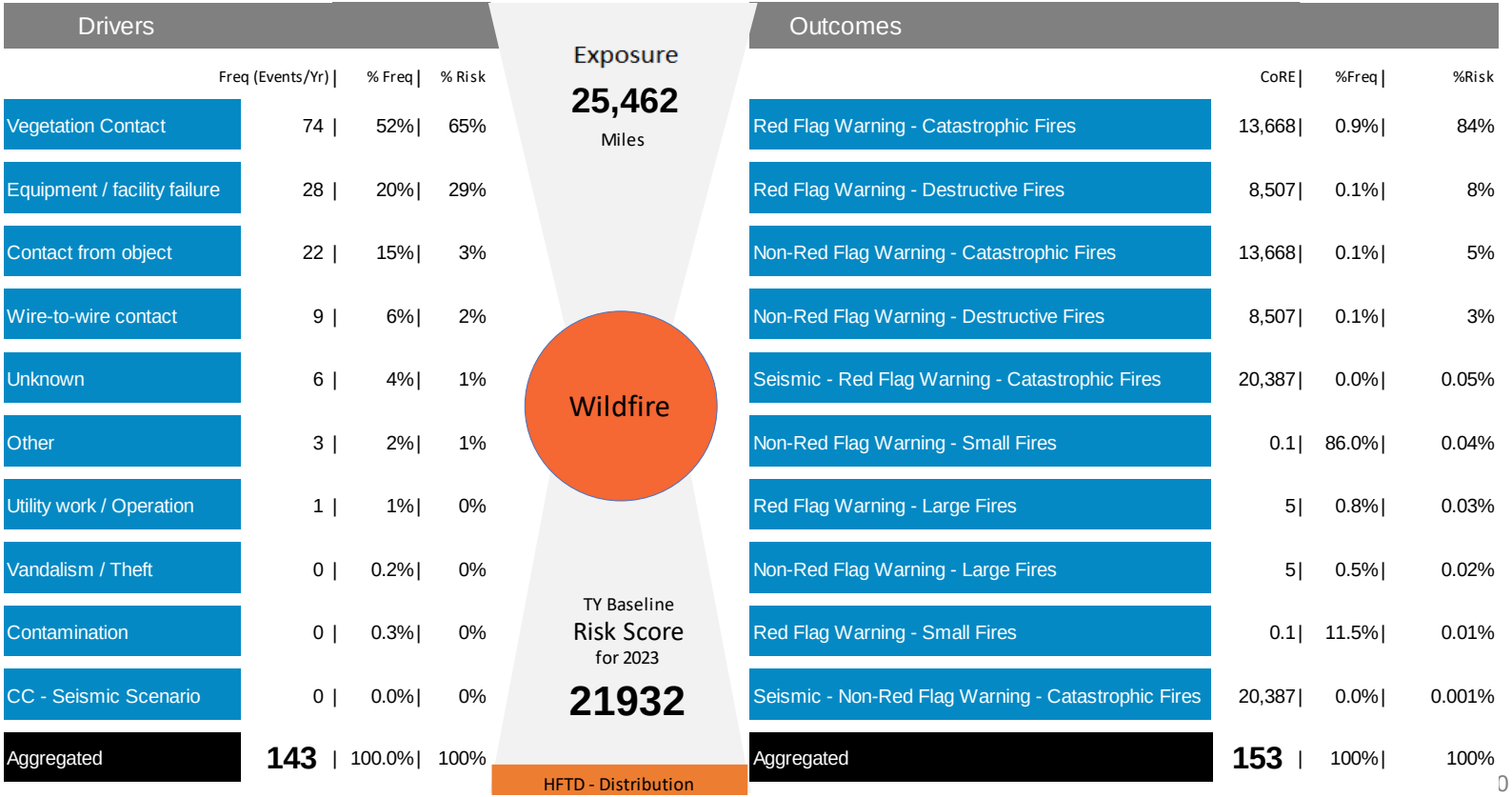
The Wildfire risk is defined as PG&E assets or activities that may initiate a fire that is not easily contained, endangers the public, private property, sensitive lands, or the environment.

- **Exposure:** ~99,000 overhead circuit miles (electric distribution and transmission). **25,462 miles HFTD Distribution.**
- ~481 risk events (ignitions) each year. **~30% of risk events occur in HFTDs each year**.
- **Risk events in HFTDs: >95% of the overall risk**.
- **Vegetation risk driver: 52% of distribution ignitions in HFTD/**28% of ignitions systemwide.
- **Equipment Failure risk driver: 20% of distribution ignitions in HFTD/** 36% of ignitions systemwide. Conductor and connection device failures account for most equipment failure incidents.
- 40 tranches in the 2023 GRC Risk Model, including **25 tranches related to distribution assets in HFTD**.
- Consequences: (1) red flag warning and non-red flag warning periods; and (2) different magnitudes of wildfire (e.g., catastrophic, destructive, large, and small)
- **89% of the risk score is due to the small number of ignitions that result in catastrophic fires** (defined as fires that burn 100 or more structures and result in a serious injury or fatality).
- **2023 TY baseline risk score: 23,033; 2026 post mitigation risk score: 18,449** (20% reduction)

Wildfire Bow-Tie: Systemwide



Wildfire Bow-Tie: HFTD Distribution



Incorporating Feedback from RAMP: Wildfire

RAMP Risk	Feedback Received	Changes Incorporated Since RAMP
WLDFR	More Granular Tranching	Total tranches increased from 8 to 40.
	More RSEs	Mitigations w/ RSEs: 17 (compared to 6 in RAMP), Controls w/ RSEs: 22 (compared to 0 in RAMP)
	Delineate Weather Conditions (Wind)	Weather is incorporated through the Wildfire Consequence model and reflected as higher chance of wind-driven ignitions during RFW.
	PSPS RSE	PSPS event excluded from RSE calculations for Wildfire.
	Update Risk Drivers	• Includes Operational Failure as a risk driver, using ignitions associated with PG&E workforce caused outages. • Drivers and sub-drivers are aligned with those in the WMP • Substation drivers in Wildfire model were enhanced.

Wildfire Risk Modeling

The EO Risk Team relies on a combination of enterprise and Electric line of business models to make risk-informed decisions related to mitigation programs, investment planning, and real time operational decisions.

Risk Model	Description
Enterprise Multi-Attribute Value Function Risk Model (MAVF)	• Aligned to the S-MAP requirements. • Assesses enterprise risks using a common framework. • Used to develop risk scores, safety scores, the risk bow-tie, and RSE values for individual risk events. • Updated to algin to the 2021 Wildfire Distribution Risk Model discussed in the 2021 WMP.
2021 Wildfire Distribution Risk Model	• Calculates wildfire risk probabilities of ignition and consequence scores for the overhead distribution system in HFTDs at the circuit segment level. • Helps to prioritize highest wildfire risk miles on PG&E's distribution system in HFTDs. • Outputs inform System Hardening and Enhanced VM work planning and scheduling.
Conductor Risk Model	• Quantifies wildfire risk due to conductor failures by calculating a probability of ignition in combination with the Wildfire Consequence Model. • Provides a risk value that is aggregated to the circuit segment level and informs prioritization of system hardening and equipment replacement efforts.
Vegetation Risk Model	• Quantifies wildfire risk due to vegetation contact with distribution facilities by calculating a vegetation probability of ignition. • Provides a risk value that is aggregated to the circuit segment level and informs the prioritization of vegetation management efforts.
Wildfire Consequence Model	• This spatial data set based on Technosylva (wildfire simulation software) fire simulations under elevated fire conditions is calibrated to be compatible with PG&E's MAVF scoring. • Produces the wildfire risk value for each grid location.

Wildfire – Situational Awareness and Forecasting – Chapter 4.1

Situational Awareness and Forecasting mitigations are designed to reduce the risk of wildfire through activities and services aimed at improving situational awareness, weather forecasting and fire risk modeling used by PG&E and other agencies to help protect all Californians.

PG&E is forecasting 10 Situational Awareness and Forecasting mitigations. Key mitigations include:

Mitigation Name	RISK ID	Description	2023 Units	Expense (2023)	Capital (2023)
Wildfire Cameras	WLDFR-M07D	Provide 90% percent viewshed coverage of Tier 2 and Tier 3 HFTDs	Replace existing cameras as needed	$8.2M	N/A
Satellite Fire Detection	WLDFR-M07E	Continued operation of and improvements to a fully operational satellite-based fire detection and alert system	N/A	$0.4M	N/A
Partial Voltage Detection	WLDFR-M07G	Technology that will help quickly inform PG&E of a wire down condition	N/A	$0.2M	N/A
Weather Stations	WLDFR-M07B	Weather station data facilitates improved understanding, modeling, and prediction of fire danger and better real-time awareness of weather conditions and fire danger.	150 weather stations	$1.8M	$3.3M
Fire Potential Index (FPI)	WLDFR-M07K	The FPI model combines weather (wind, temperature, and relative humidity) and vegetative fuels into an index that represents the probability of large fires to occur.	N/A	$0.2M	N/A

Wildfire – PSPS Operations – Chapter 4.2

PG&E's PSPS program includes activities supporting information-gathering, decision-making, and customer-outreach processes when PG&E considers proactively de-energizing portions of the PG&E electric system in the interest of public safety.

PG&E is forecasting 15 PSPS Operations mitigations (WLDFR-M006). Key mitigations include:

Mitigation Name	RISK ID	Description	2023 Units	Expense (2023)	Capital (2023)
PSPS Event	WLDFR-M005	Proactively de-energizes select circuit segments within (or that pass through) Tier 2 and Tier 3 HFTD areas when elevated fire danger conditions occur.	3+ events per year*	$73M	N/A
Community Resource Center (CRC) Preparedness Program	WLDFR-M006	Portfolio of indoor and outdoor CRC locations and preparations to staff and set up CRCs during PSPS events.	N/A	$15.7M	$0.3M
Field Training and Exercises	WLDFR-M006	Training crews to efficiently restore power following a PSPS event while maintaining public and employee safety.	N/A	$2.6	N/A
PSPS Collateral / Segment Creation	WLDFR-M006	Planning and documentation development that support restoration of service after PSPS events. Specifically, "step restoration" processes are used during PSPS restoration, an approach optimized for safety and efficiency.	N/A	$0.1M	N/A

*PG&E has recently modified its 2021 WMP to reflect an estimate of five PSPS events per year.

Wildfire – System Hardening Chapter 4.3

PG&E's System Hardening program reduces the risk of wildfire ignitions caused by distribution facilities and targets three risk areas in PG&E's service territory: (1) the top 20 percent of highest wildfire risk miles; (2) overhead structures previously impacted directly by wildfires; and (3) areas most impacted by PSPS.

PG&E is forecasting one System Hardening mitigation (WLDFR-M002) that includes:

Mitigation Name	RISK ID	Description
System Hardening (SH) – Overhead (OH)	WLDFR-M002	PG&E analysis indicates that overhead system hardening will reduce 62 percent of the distribution overhead asset ignitions caused by equipment failures or external contacts with energized lines, such as vegetation tree strikes.
System Hardening – Underground	WLDFR-M002	Relocating existing high-risk overhead distribution lines to underground is the preferred mitigation when addressing PSPS impacts, ingress and egress concerns, and significant tree fall-in risk.
System Hardening – Butte County*	WLDFR-M002	Underground construction of electric distribution assets in the Town of Paradise and parts of Butte County.
System Hardening – Remote Grid	WLDFR-M002	Removing long electric distribution feeders serving isolated small customer loads and serving customers through the deployment of a local and decentralized energy source and 'remote' grid.

* System Hardening work in Butte County is also accounted for in wildfire mitigation WLDFR-M014 and described in Exhibit (PG&E-4), Chapter 23.

Wildfire – System Hardening Chapter 4.3

System Hardening: forecast costs and number of miles 2021-2026

	2021	2022	2023	2024	2025	2026
Overhead	$288,000	$667,113	$642,960	$625,949	$627,523	$629,109
Miles	180	423	423	405	405	405
Forecast Cost/Mile	$1,600	$1,577	$1,520	$1,546	$1,549	$1,553
Underground	$86,120	$202,664	$194,742	$188,100	$188,100	$188,100
Miles	20	47	47	45	45	45
Forecast Cost/Mile	$4,306	$4,312	$4,143	$4,180	$4,180	$4,180
Butte Rebuild *	$41,534	$58,172	$71,245	$65,922	$48,830	$0
Miles	10	14	16	14	9	–
Forecast Cost/Mile	$4,282	$4,126	$4,398	$4,743	$5,366	$0
Total Forecast Cost	**$415,654**	**$927,949**	**$908,947**	**$879,971**	**$864,454**	**$817,209**
Total Forecast Miles	**210**	**484**	**486**	**464**	**459**	**450**

Pace of Hardening: PG&E forecasts that the pace of system hardening will increase substantially in 2022, to 470 miles, then stabilize between 450 and 500 miles per year between 2023 and 2026. (Not counting Butte County.)

* System Hardening work in Butte County is also accounted for in wildfire mitigation WLDFR-M014 and described in Exhibit (PG&E-4), Chapter 23.

Wildfire – PSPS Impact Mitigations Chapter 4.3

PG&E understands that de-energizing customers causes significant disruption and is actively working to reduce the impact on our customers. PG&E is forecasting the following, asset-based PSPS Impact Reduction Initiatives.

Mitigation Name	RISK ID	Description	2023 Units	Expense (2023)	Capital (2023)
Generation Enablement and Deployment	WLDFR-M006	Organization to procure and deploy temporary generation systemwide to support PSPS events including to: temporary substation microgrids; temporary distribution microgrids; back-up power for individual critical customer facilities; and Community Resources Centers.	N/A	$2.0M	N/A
Sectionalizing Devices	WLDFR-M006	Remote operated SCADA sectionalizing devices on the distribution system can support PG&E's ability to more flexibly operate the grid and segment distribution circuits near HFTD boundaries to reduce the size / scope of PSPS events.	100 devices	N/A	$11.9M

Other wildfire risk mitigation activities also have PSPS scope and impact reduction benefits, including System Hardening, enhanced situational awareness and forecasting initiatives, and customer programs that support customers before, during and after PSPS events.

Wildfire – Enhanced Automation Chapter 4.3

Enhanced Automation technologies will continue to reduce the possibility of ignitions caused by PG&E assets.

PG&E is forecasting 8 Enhanced Automation Mitigations. Key mitigations include:

Mitigation Name	RISK ID	Description	2023 Units	Expense (2023)	Capital (2023)
Reclosers	WLDFR-M10A WLDFR-M10B	Replace outdated line recloser controllers in HFTD areas. Install FuseSavers in HFTD areas that are equipped with SCADA and can be used as PSPS sectionalizing devices.	80 FuseSavers	N/A	$2.9M
Distribution Grid Sensors	WLDFR-M07A WLDFR-M011 WLDFR-M012	Install distribution grid sensors that detect non-equipment failure types that cannot be detected by existing detection methods or patrol techniques.	Multiple programs: M07A – ~50 circuits M011 – ~16 circuits M012 – 116 circuits	$3.4M	$22.7M
Rapid Earth Fault Current Limiter (REFCL)	WLDFR-M10C	REFCL technology has the potential to mitigate ignitions from line-to-ground faults such as wire down or tree contacts.	TBD	N/A	$17.3M
Distribution, Transmission and Substation Fire Action Schemes and Technology (DTS-FAST)	WLDFR-M10D	Fraction-of-a-second technologies to detect an object approaching an energized power line and respond quickly to shut off power before the object impacts the line.	N/A	This technology is currently in a pilot phase	

Wildfire – Other Wildfire Mitigations

Mitigation Name	RISK ID	Description	2023 Units	Expense (2023)	Capital (2023)
Enhanced Vegetation Management (Chapter 9)	WLDFR-M001	Targets overhead distribution lines in Tier 2 and Tier 3 HFTD areas and supplements PG&E's annual Routine VM work. EVM further mitigates the possibility of wildfire ignitions and/or downed wires due to vegetation-conductor contact.	At least 1,890 miles per year*	$550.7M	N/A
Non-Exempt Surge Arrester Replacement (Chapter 11)	WLDFR-M003	Replaces non-exempt surge arresters with exempt surge arresters and corrects abnormal grounding issues where necessary focus on completing replacements in HFTD Tier 2 and Tier 3 areas.	3,952 surge arrester replacement locations	N/A	$17.8M
Expulsion Fuse Replacement (Chapter 4.3)	WLDFR-M004	Targets non-exempt expulsion fuses. If a non-exempt expulsion fuse operates, it has the potential to spread hot molten metal material that could cause an ignition. Focus on HFTD Tier 2 and 3 areas.	1,200 fuses	N/A	$15.8M
Pole Programs-Tree Attachments (Chapter 12)	WLDFR-M013	Trees identified with PG&E facilities attached to them and are relaced with a new pole.	270 tree attachments	N/A	$3.3M

*PG&E's Wildfire Risk Governance Steering Committee (WRGSC) ensures that PG&E's wildfire workplan includes the highest priority, risk-mitigating work consistent with investment, asset strategy and operational needs. The EVM plan is focused on the highest risk circuit protection zones.

Wildfire – CWSP PMO and Information Technology for Wildfire Mitigations

The Community Wildfire Safety Program (CWSP) Program Management Office (PMO) (WLDFR-M009) – Chapter 4.4

Delivers on the key elements of PG&E's annual Wildfire Mitigation Plan (WMP). The CWSP PMO provides the foundational coordination, support, tracking, and governance needed to effectively execute the WMP and manage the CWSP across multiple functions, internal teams, and work streams.

IT for Wildfire Mitigations – Chapter 4.5

Enables and supports wildfire response and mitigation efforts through a portfolio of IT solutions including:

- Improved data quality efforts such as the Public Safety Power Shutoff (PSPS) Data Quality enhancement and Grid Data Analytics Tool that support programs to reduce wildfire risk;
- Risk reduction through risk-based data models, such as Remote Sensing Data Platform, Risk Assessment & Mapping and Asset Management & Inspections, that will drive more informed decision making related to wildfire risk and asset management;
- More agile PSPS event scoping and operations through the deployment of tools such as PSPS Viewer, PSPS Situational Intelligence Platform and PSPS External Portal;
- Enhanced customer notifications and self-service tools to better support customer needs during wildfire and PSPS events; and
- More stable and reliable technology platforms to support critical wildfire and PSPS operations.

Forecast Wildfire Mitigation Costs

Line No.	Chapter Name	Ex.	Chpt.	(Thousands of Nominal Dollars) Expense Forecast 2021	2022	2023	(Thousands of Nominal Dollars) Capital Forecast 2021	2022	2023	2024	2025
1	Situational Awareness and Forecasting	4	4.1	$59,348	$54,559	$43,416	$9,451	$9,375	$4,601	$3,290	$3,341
2	PSPS Operations	4	4.2	127,920	119,254	115,266	3,084	3,237	262	269	277
3	System Hardening, Enhanced Automation, and PSPS Impact Mitigations	4	4.3	6,903	6,679	11,595	520,005	1,020,491	990,063	951,082	938,034
4	CWSP PMO	4	4.4	27,801	14,994	13,460	-	-	-	-	-
5	Information Technology for Wildfire Mitigations	4	4.5	35,700	35,700	35,700	25,300	25,300	25,300	25,300	25,300
6	Overhead and Underground ED Maintenance	4	11	-	-	-	88,859	16,804	-	-	-
7	Pole Asset Management	4	12				-	3,303	3,296	3,500	3,709
8	Community Rebuild Program	4	23	-	-	-	-	-	114,341	104,985	77,163
10	Communications	6	11	15,700	15,700	9,550	-	-	-	-	-
11	**Total WMBA**			**$273,372**	**$246,886**	**$228,987**	**$646,699**	**$1,078,510**	**$1,137,863**	**$1,088,426**	**$1,047,824**
12	Vegetation Management	4	9	535,952	553,916	550,686					
13	**Total Wildfire Mitigations**[(a)]			**$809,324**	**$800,802**	**$779,673**					

(a) Differences due to rounding

Wildfire Mitigation RSEs

Line No.	Program Name	Program ID	RSE (A)
1	Situational Awareness and Forecasting Initiatives - Partial Voltage Technologies [Control] (B)	WLDFR-M07G [Control]	281.85
2	Situational Awareness and Forecasting Initiatives - Satellite Fire Detection	WLDFR-M07E	154.01
3	Situational Awareness and Forecasting Initiatives - EFD	WLDFR-M011	60.66
4	System Hardening [Remote Grid]	WLDFR-M017	30.08
5	Additional System Automation and Protection - REFCL	WLDFR-M010[49R]	23.02
6	Additional System Automation and Protection - FuseSaver	WLDFR-M010[49T]	20.01
7	Situational Awareness and Forecasting Initiatives - Cameras [Control] (B)	WLDFR-M07D [Control]	19.40
8	Situational Awareness and Forecasting Initiatives - Line Sensors	WLDFR-M07A	16.85
9	PSPS Reduction Initiatives - Sectionalizer Device Install/Replace	WLDFR-M06A	12.67
10	System Hardening [Overhead]	WLDFR-M002	5.64
11	System Hardening [Underground]	WLDFR-M002UG	4.50
12	Enhanced Vegetation Management	WLDFR-M001	2.52
13	Expulsion Fuse Replacement	WLDFR-M004	1.20
14	Butte County Rebuild	WLDFR-M014	1.00
15	Safety Infrastructure Protection Teams (B)	WLDFR-M008	0.98
16	Pole Programs - Replace Tree Attachments	WLDFR-M013	0.30

(A) For mitigations or controls that apply to more than one risk the RSE is the sum of the RSEs for each mitigation or control program. For example, the RSE for Enhanced Vegetation Management (EVM) is 2.52. This RSE is sum of the RSE for Wildfire EVM and Failure of Electric Distribution Overhead Assets EVM.

(B) WLDFR-M07D and WLDFR-M07G are mitigation programs. The RSE for these programs was calculated as a control PG&E will not be installing new assets from 2021 through 2023 but instead will be relocating and maintaining existing assets.

Complying with WSD-002
The CPUC issued Resolution WSD-002 to give the electrical corporations guidance on their 2020 WMPs.

In the decision on PG&E's 2020 GRC, the Commission required that in the next GRC (PG&E's 2023 GRC) PG&E must include testimony that shows or explains how its RSE calculation complies with Resolution WSD-002.

WSD-002 stated that electrical corporations shall not rely on RSE calculations as a tool to justify the use of PSPS.

To comply with WSD-002 PG&E did not calculate an RSE for the benefits of PSPS as a mitigation to the Wildfire risk.

Wildfire Controls RSEs

Line No.	Program Name	Program ID	RSE (A)
1	Vegetation Management - Distribution Overhead	WLDFR-C004	3,541.19
2	Vegetation Management - CEMA/Tree Mortality	WLDFR-C007	2,122.15
3	Pole Restoration Program	WLDFR-C12E	1,118.45
4	Patrols and Inspections - Substation	WLDFR-C003	982.57
5	Intrusive Wood Pole Inspection Program	WLDFR-C12A	343.39
6	Patrols - Distribution Overhead	WLDFR-C001	95.24
7	Equipment Maintenance and Replacement – Distribution Overhead	WLDFR-C008[2AA, KAA, KAQ]	90.22
8	Pole Replacement	WLDFR-C12C	76.09
9	Overloaded Pole Replacements	WLDFR-C12D	67.77
10	Inspections - Distribution Overhead	WLDFR-C01A	47.67
11	Fire Protection / Fire Suppression Systems Substation	WLDFR-C018	35.00
12	Infrared Inspections - Distribution Overhead	WLDFR-C01B	28.57
13	Animal Abatement	WLDFR-C011	1.83
14	Substation Proactive Asset Replacement - Insulators	WLDFR-C10I	0.94
15	Substation Proactive Asset Replacement - Breakers	WLDFR-C10D	0.68
16	Vegetation Management - Substation	WLDFR-C006	0.48
17	Substation Proactive Asset Replacement - Switchgear	WLDFR-C10F	0.13
18	Substation Proactive Asset Replacement - Transformer	WLDFR-C10K	0.10
19	Substation Proactive Asset Replacement - Switches	WLDFR-C10E	0.08
20	Substation Proactive Asset Replacement - Batteries	WLDFR-C10C	0.01
21	Proactive Asset Replacement - Ground Grid	WLDFR-C10A	0.01
22	Substation Security Enhancements	WLDFR-C10M	0.00

(A) For mitigations or controls that apply to more than one risk the RSE is the sum of the RSEs for each mitigation or control program. For example, the RSE for Enhanced Vegetation Management (EVM) is 2.52. This RSE is sum of the RSE for Wildfire EVM and Failure of Electric Distribution Overhead Assets EVM.

Wildfire – Complying with the CPUC Ruling Requiring Updated Analysis of PSPS

On June 3, 2021 the CPUC ruled on a joint motion finding it appropriate for PG&E to provide testimony in this GRC concerning updated risk analysis of the estimated consequences of initiating PSPS events and that the testimony must contain analysis and discussion of the consequences of PSPS for customers and how PG&E analyzes those consequences.

PG&E divided this analysis of PSPS into three components: (1) the frequency of PSPS events, (2) the scope of the event (customers impacted), and (3) the duration of the customer impact.

- **Frequency of a PSPS Event** - To estimate the frequency of a PSPS event PG&E used a 10-year historical review based on PG&E's 2020 PSPS protocols and estimated the number of expected events that would have occurred between 2010 to 2019. The review estimated that there would have been 29 events over the 10 years, roughly 2.9 events per year. Given the uncertainty around borderline weather events PG&E estimates 1 extra event per year, totaling a likelihood of a risk event (LoRE) of 3.9 per year.*
- **PSPS Scope and Duration -** Identified as the Consequence of a Risk Event (CoRE). Based on the above mentioned 10-year lookback approach, PG&E estimated the number of customers impacted and the average duration of each event. From this data PG&E evaluated the safety, reliability and financial consequences.
  - **Safety Consequences -** For the 2023 GRC Enterprise Risk Model, PG&E used both PG&E's historical PSPS events data and the data from large-scale unplanned outages across the United States to represent safety. The unplanned outage events do not provide customers with notification of upcoming de-energization, and therefore, are not comparable to PG&E's PSPS events, which are preceded by extensive customer notifications and involve numerous mitigation steps
  - **Reliability Consequences -** Based on customer minutes interrupted. To estimate this impact, PG&E used historical PSPS events, including 2020 PSPS events.
  - **Financial consequences to customers -** Represented by estimated ratepayer costs for a PSPS event.

PG&E is also undertaking more comprehensive and granular risk analysis and modelling at the circuit level to help prioritize mitigation activities at targeted locations. The output from this circuit-level PSPS consequence analysis will help PG&E target PSPS impact reduction programs to locations that may experience a high frequency of PSPS events or where a PSPS event would have a greater customer impact.

*PG&E has recently modified its 2021 WMP to reflect an estimate of five PSPS events per year.

The required testimony is provided in Chapter 3 of Exhibit (PG&E-4), starting on page 3-25.

Exhibit (PG&E-5)
Energy Supply

Greg Bosscawen

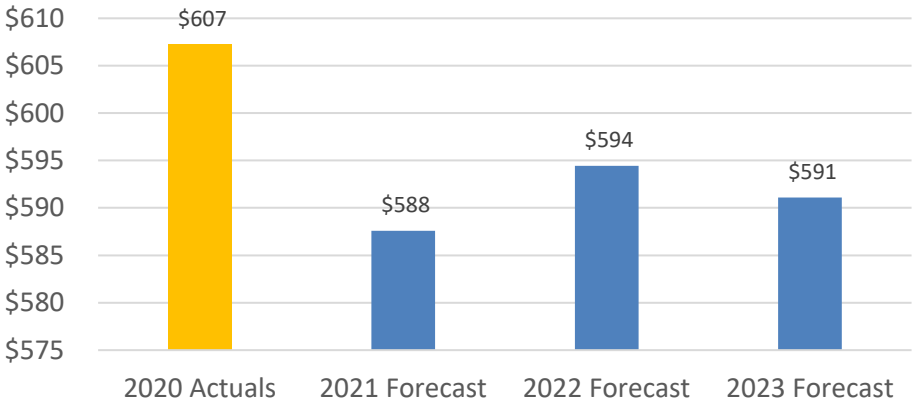
GRC Case Manager,
Energy Supply

Energy Supply – Exhibit Structure

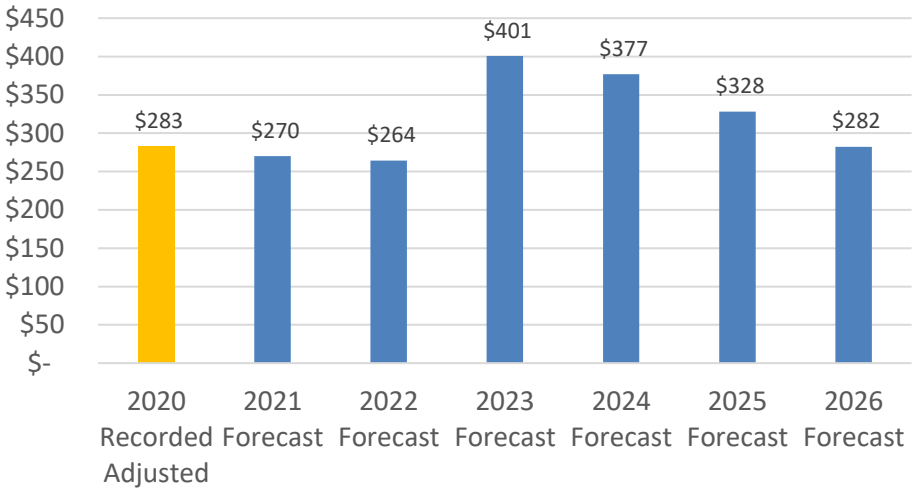
Chapter No.	Chapter Name	Witness
1	Energy Supply Summary	Greg B. Bosscawen
2	Energy Supply Risk Management	Eric Van Deuren/Russ Prentice
3	Nuclear Operations Costs	Thomas Baldwin
4	Hydro Operations Costs	Eric Van Deuren
5	Natural Gas and Solar Generation Operations Costs	Steve Royall
6	Energy Procurement Administration Costs	Candice Chan
7	Energy Supply Technology Programs	Dana Longmire
8	Energy Supply Ratemaking	Rebecca Doidge

Summary of Energy Supply Forecast Expense and Capital Expenditures

Expense
(millions of nominal dollars)

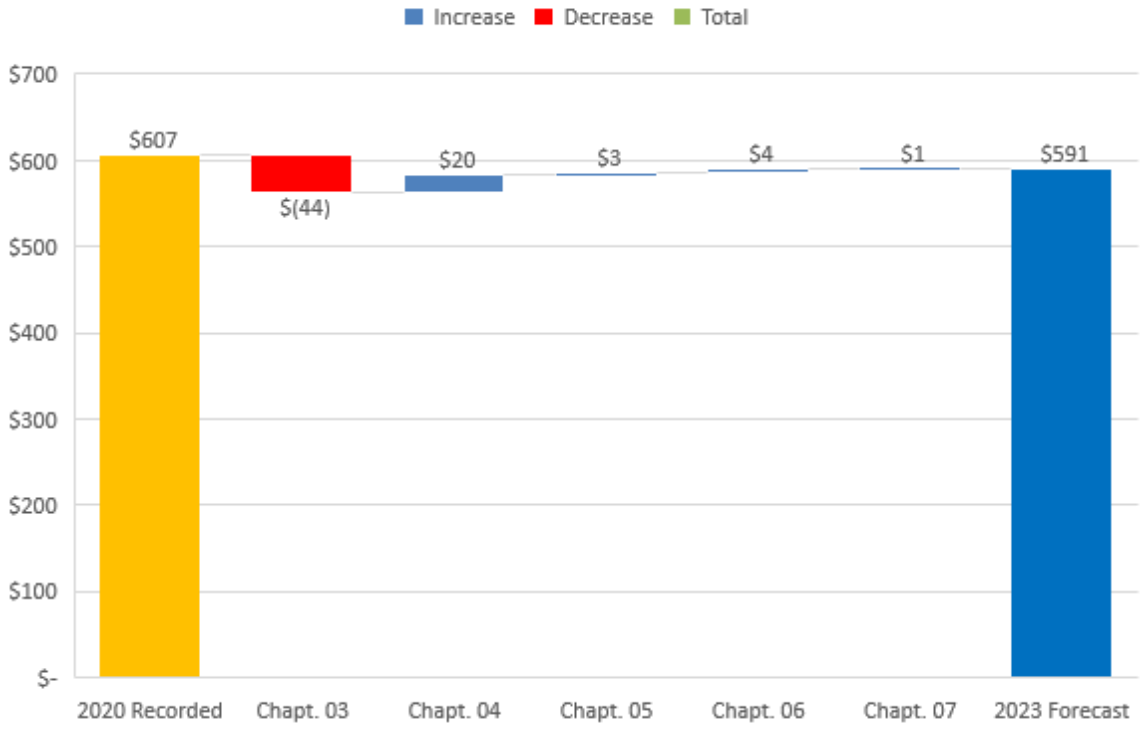


Capital
(million of nominal dollars)



Energy Supply Expense Walk
(Millions of Nominal Dollars)

Chapter 3 – Nuclear Operations Costs ($)
Chapter 4 – Hydro Operations Costs ($)
Chapter 5 – Natural Gas and Solar Generation Operations ($)
Chapter 6 – Energy Procurement Administration Costs ($)
Chapter 7 - Energy Supply Technology Programs ($)



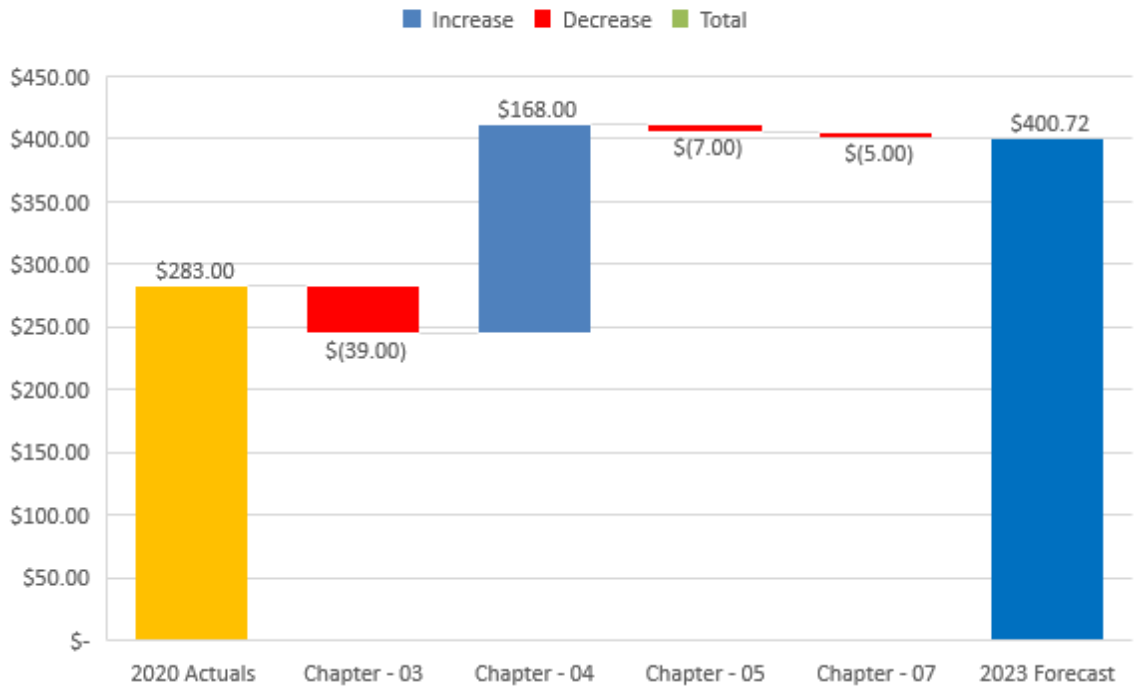
Key Cost Changes from 2020 Recorded Expenses

2020 Recorded – $607M; 2023 Forecast – $591M; Decrease = $16M

- $(44M) – Nuclear generation employee attrition at completion of four-year retention plan and 2023 outage work scope and duration reductions compared to 2020 and completion of other projects (Ch.3)
- $20M – Hydroelectric escalation and regulatory compliance activities (Ch.4)
- $3M – Natural gas generation engine overhauls at Humboldt Bay Generating Station offset by long term service agreement cost savings at Gateway and Colusa and the forecasted retirement of the fuel cells (Ch. 5)
- $4M - Energy Procurement Administration escalation (Ch. 6)
- $1M - Energy Supply Technology Programs upgrade of software applications that support data analysis, field work management and risk mitigation capabilities (Ch. 7)

Energy Supply Capital Walk
(Millions of Nominal Dollars)

Chapter 3 – Nuclear Operations Costs
Chapter 4 – Hydro Operations Costs
Chapter 5 – Natural Gas and Solar Generation Operations
Chapter 6 – Energy Procurement Administration Costs
Chapter 7 - Energy Supply Technology Programs



Key Cost Changes from 2020 Recorded Capital Expenditures

2020 Recorded – $283M; 2023 Forecast – $401M; Increase = $118M

- $168M – Hydroelectric licensing and risk mitigations associated with the Large Uncontrolled Water Release risk (Ch.4)
- $(39M) – Nuclear generation reduction due to DCPP retirement (Ch.3)
- $(7M) – Natural gas generation completion of one-time projects in 2020 or projects that are expected to be completed before 2023 (Ch.5)
- $(5M) – Decrease in IT projects due to DCPP retirement (Ch.7)

RAMP Risks in 2023 GRC

RAMP Risk	2023 TY Baseline Risk Score	2026 Mitigated Risk score	2023-2026 GRC Forecast – Cap	2023-2026 GRC Forecast – Exp	Total
LGUWR	73	59	$388.1M	$42.3M	$430.4M

*Forecasts represent total cost of both mitigations and controls used to calculate the RSEs in the risk models.

Comparison of RAMP and GRC Mitigation Forecasts

RAMP Risk	2020-2026 RAMP Estimate – Cap	2020-2026 GRC Forecast – Cap	Difference – Cap	2020-2026 RAMP Estimate – Exp	2020-2026 GRC Forecast – Exp	Difference – Exp
LGUWR	$481.6M	$506.7M	$25.1M	$16.6M	$24.4M	$7.8M

Differences Between RAMP and GRC

- PG&E is forecasting the same mitigation categories in the GRC as it included in the 2020 RAMP Report. However, the scope and pace of certain individual projects within the overall mitigation category has changed.

Incorporating Feedback from RAMP

In the GRC PG&E provides more RSEs for mitigations and controls.

RAMP Risk	RAMP Mitigations w/ RSE	GRC Mitigations w/ RSE	RAMP Controls w/ RSE	GRC Controls w/ RSE	RAMP Tranches	GRC Tranches
LGUWR	4	4	0	1	61	61

SPD found that the tranches used in PG&E's LGUWR model are appropriately granular given that each of PG&E's 61 dams classified as high or significant is its own unique tranche.

Other Requests

Hydro

- Expand use of two-way Hydro Licensing Balancing Account (HLBA)
- An update to the hydro decommissioning reserve
- Establish a new memorandum account to track the costs of a capacity uprate at the Helms Pumped Storage Facility

Natural Gas and Solar

- An update to the Natural Gas and Solar decommissioning reserve
- Levelization of long-term service agreement combined cycle outages

Nuclear

- 2021-2026 forecast provided for attrition purposes
- An update to the project cancellation amounts
- An update to the Credits for Department of Energy Litigation proceeds
- An update of the end-of-life DCPP materials surplus inventory balance, proposed changes in the treatment of the salvage activity, and an increase in the amortization period for the materials surplus inventory.

Exhibit (PG&E-6) Customer and Communications

Bill Chen
GRC Case Manager,
Customer and Communications

Customer and Communications Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Customer and Communications Summary	Meghan Dewey
1A	Regional Vice Presidents	Matt Plummer
2	Customer Engagement	Vic Baker
3	Pricing Products and Income-Qualified Programs	Emily Bartman and Claire Coughlan
4	Contact Centers, Customer Technology and Digital Strategy	Matt Briel and David Graham
5	Customer Service Offices	Trish Williams
6	Billing, Revenue and Credit	Lorenzo Hagos

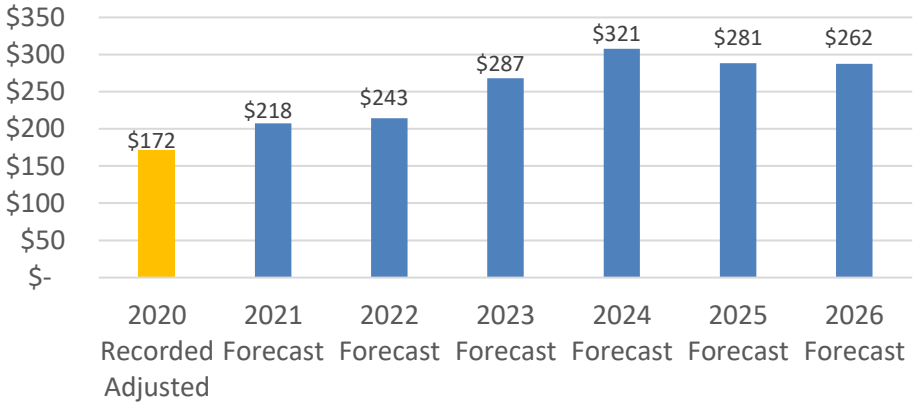
Customer and Communications Exhibit Structure

Chapter No.	Chapter Name	Witness
7	Metering Services and Engineering	Earle Davis
8	Compliance and Regulatory Strategy	Megan Ardell
9	Gas AMI Module Replacement	David Console
10	Customer Care Technology Projects	Matt Hedges
11	Communications	Susie Martinez

Summary of Customer and Communications Forecast Expense and Capital Expenditures

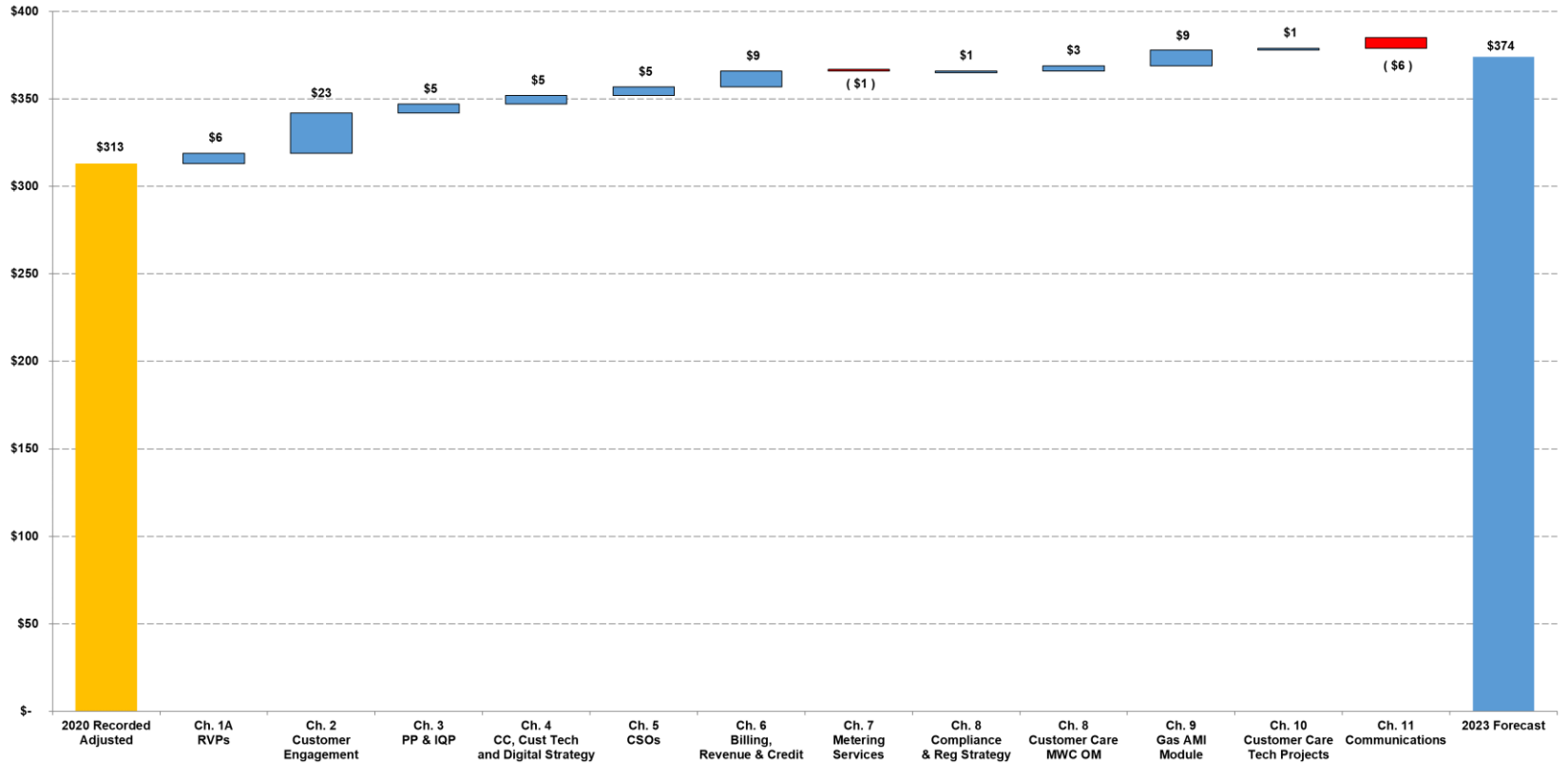
Expense
(millions of nominal dollars)

Capital
(millions of nominal dollars)



Customer and Communications Expense Walk

(millions of nominal dollars)



Key Cost Changes from 2020 Recorded Expenses

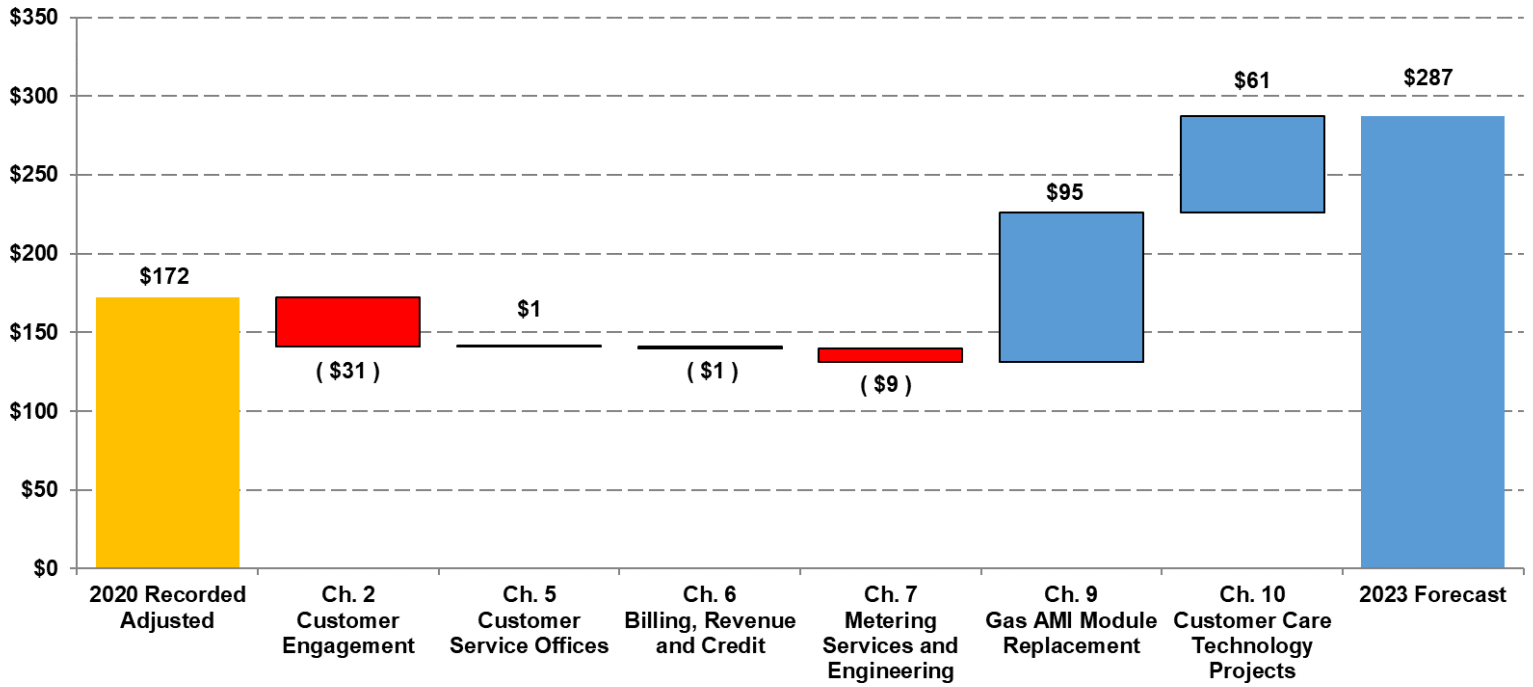
2020 Recorded – $313M; 2023 Forecast – $374M; Increase = $61M

Key Expense Drivers

- $13M – Resumption of Operations Post-COVID
  - $4M – Customer Service Offices (CSOs) staff (Ch. 5)
  - $9M – Billing and credit activities (Ch. 6)
- $9M – Gas AMI Module Replacement labor and program activities (Ch. 9)
- $9M – Greater demand for non-tariffed products and services (Ch. 2)
- $8M – PSPS planning and readiness (Ch. 2)
- $6M – Regional Vice Presidents and staff (Ch. 1A)

Customer and Communications Capital Walk

(millions of nominal dollars)



Key Cost Changes from 2020 Recorded Capital Expenditures

2020 Recorded – $172M; 2023 Forecast – $287M; Increase = $115M

Key Capital Drivers

- $95M – Gas AMI Module Replacement Project (Ch. 9)
- $61M – Customer Care Technology Projects (Ch.10)
  - Billing System Upgrade
  - PGE.com Web Upgrade
  - California Consumer Privacy Act of 2018 (CCPA) and California Privacy Rights and Enforcement Act of 2020 (CPRA) compliance

Other Requests

Memoranda of Understanding

- Center for Accessible Technology (CforAT) – Enhancing the accessibility of services for customers with disabilities.
- National Diversity Coalition (NDC) – Delivering programs to support the needs of underserved communities, including communities of color.
- Small Business Utility Advocates (SBUA) – Advancing the interests of small businesses and including a new initiative focusing on Environmental and Social Justice (ESJ) concerns.

Memorandum Accounts

- California Distributed Generation Statistics Website Memorandum Account (CDGSWMA) – Proposal to close and cost recovery of the recorded balance.
- Wildfire Mitigation Plan Memorandum Account (WMPMA) – Cost recovery for 2020 recorded wildfire communications costs.

Exhibit (PG&E-7) Shared Services and Information Technology

Geri Callejas
GRC Case Manager,
Shared Services and Information Technology

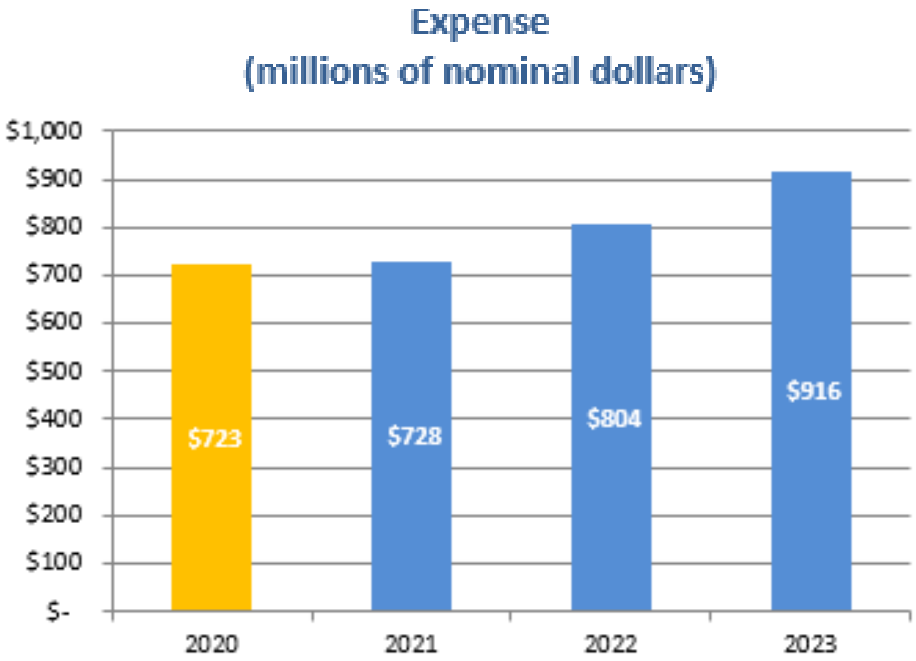
Shared Services and Information Technology – Exhibit Structure

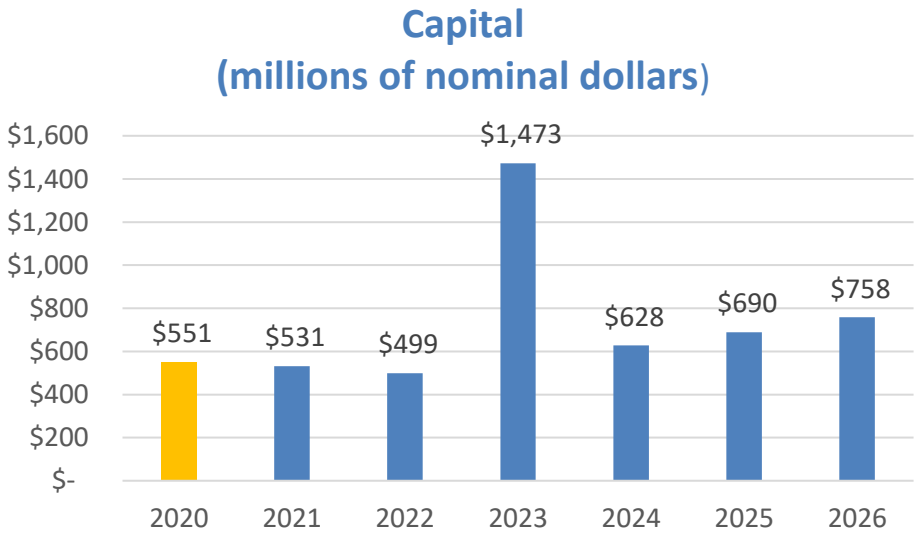
Chapter No.	Chapter Name	Witness
1	Enterprise Health and Safety	James Darnell
1a	Occupational Health	Heather Hornbrook
2	Transportation and Aviation Services	Michael Glover/ Christopher Steeb
3	Materials	Lance C. Schultz
4	Sourcing	David Kevane
5	Real Estate	Tom Crowley
6	Land and Environmental Management	Andrew K. William
7	Enterprise Records and Information Management and Enterprise Data Governance	Erica Johnson/ Ling Huang/ Gail Engstrom

Shared Services and Information Technology – Exhibit Structure

Chapter No.	Chapter Name	Witness
8	Information Technology	Paul Nielsen/ Ajay Pathak
9	Cyber and Corporate Security	Martin Strasburger/ James Murphy
10	Geosciences	Jeffrey Bachhuber
11	Enterprise Risk Management	Rick Ito

Summary of Shared Services and Information Technology Forecast Expense





Key Cost Changes from 2020 Recorded Expenses

2020 Recorded – $723; 2023 Forecast – $916; Increase = $193M

Departments' Expenses

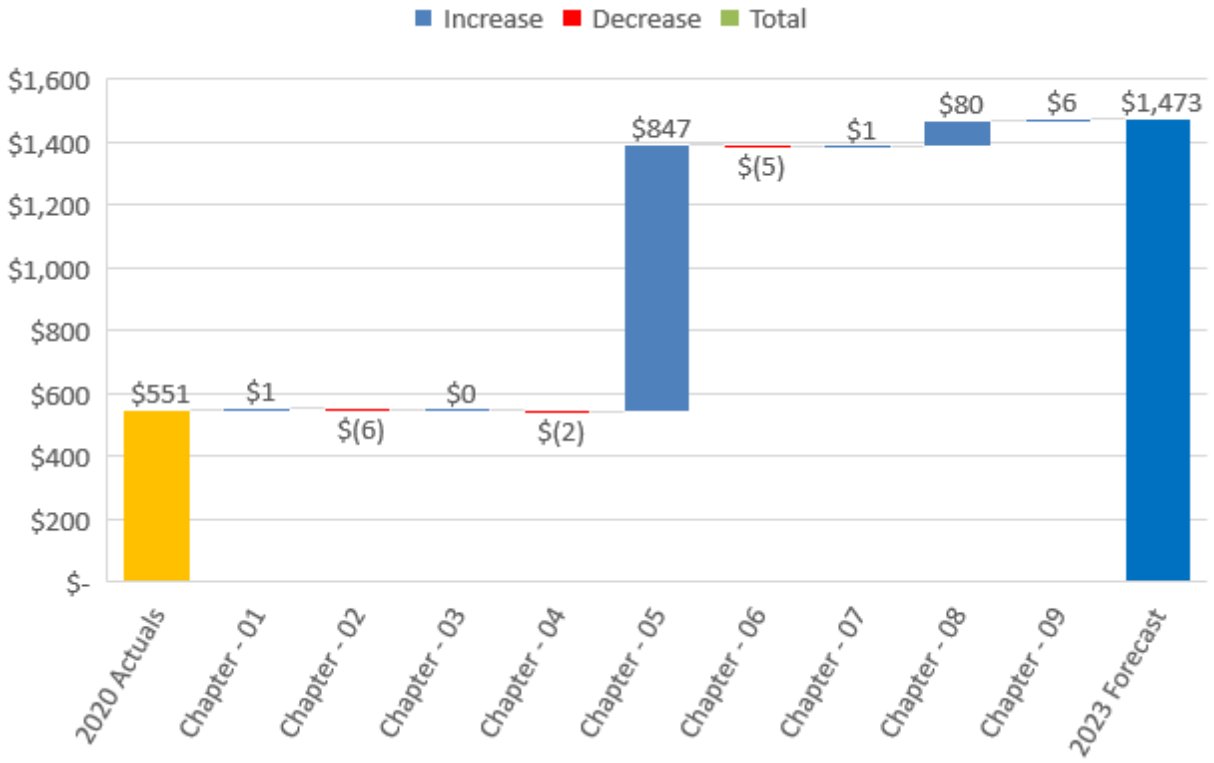
- **$102M –** IT transition from PG&E-owned platforms to commercial cloud services (Ch.8)
- **$15M –** Corporate Real Estate Oakland Lakeside Transition plan (HQ move) (Ch.5)
- **$13M –** Transportation and Aviation Services fleet operating costs (Ch.2)
- **$8M –** Enterprise Records and Information M and Enterprise Data Governance implementation of new Enterprise Data Governance department and enhancements to records mitigations (Ch.7)

<u>EHS Company-wide Expenses</u>

- **$30M –** Occupational Health increased use of long and short-term disability program services (Ch.1A)

Shared Services Capital Walk (Millions of nominal dollars)

Chapter 1 – Enterprise Health and Safety
Chapter 2 – Transportation and Aviation Services
Chapter 3 – Materials
Chapter 4 – Sourcing
Chapter 5 – Real Estate
Chapter 6 – Land and Environmental Management
Chapter 7 – ERIM and Enterprise Data Governance
Chapter 8 – Information Technology
Chapter 9 – Cyber and Corporate Security



Key Cost Changes from 2020 Recorded Capital Expenditures

2020 Recorded – $551M; 2023 Forecast – $1,473B; Increase = $992M

- **$847M –** Corporate Real Estate Oakland Lakeside Transition plan (HQ move)(Ch.5)

- **$80M –** IT Asset Failure Risk replacement or upgrade of end-of-life infrastructure and software, including telecommunication network assets and Geographic Information System (GIS) software (Ch.8)

RAMP Risks and Cross-Cutting Factors in 2023 GRC

RAMP Risk / Cross Cutting Factor	2023 TY Baseline Risk Score	2026 Mitigated Risk score	2023-2026 GRC Forecast – Cap(A)	2023-2026 GRC Forecast – Exp(A)	Total
CYBER (B)	142	123	$124.0M	$130.7M	$254.7M
ITAFL (B)	89	57	$754.4M	$141.1M	$895.4M
PHYSA	PG&E does not calculate risk scores for cross-cutting factors		$2.0M	$141.2M	$143.2M
RECIM	PG&E does not calculate risk scores for cross-cutting factors		$8.0M	$62.9M	$70.9M
REFFL	128	122	$459.7M	$4.2M	$463.9M

(A) Costs include both mitigation and control forecast costs.
(B) Cyber Attack and IT Asset Failure were considered cross-cutting factors in the 2020 RAMP. In the GRC they are considered both cross-cutting factors and risk events.

RAMP Risks and Cross-Cutting Factors in 2023 GRC

RAMP Risk / Cross Cutting Factor	2023 TY Baseline Risk Score	2026 Mitigated Risk score	2023-2026 GRC Forecast – Cap(A)	2023-2026 GRC Forecast – Exp(A)	Total
CNTSI	85	70	$0	$16.8M	$16.8M
EMPSI	94	82	$0	$757.9M	$757.9M
MTRSI	14	10	$0	$30.0M	$30.0M
TPTSI (B)	924	921	$0	$1.1M	$1.1M

(A) Costs include both mitigation and control forecast costs.
(B) Excludes forecast costs for mitigations and controls sponsored by other lines of business.

Comparison of RAMP and GRC Mitigation Forecasts for Risk Events

RAMP Risk	2020-2026 RAMP Estimate – Cap	2020-2026 GRC Forecast – Cap	Difference – Cap	2020-2026 RAMP Estimate – Exp	2020-2026 GRC Forecast – Exp	Difference – Exp
REFFL	$80M	$121.7M	$41.7M	$6.5M	$4.4M	$(2.1M)
CNTSI	$0	$0	$0	$38.3M	$15.7M	$(22.7M)
EMPSI	$0	$0	$0	$88.3M	$49.3M	$(39.0M)
MTRSI	$0	$0	$0	$18.2M	$18.2M	$0
TPTSI	$0	$0	$0	$5.2M	$4.6M	$(0.6M)

Differences Between RAMP and GRC

- REFFL - PG&E is forecasting the same mitigation in the GRC as it included in the 2020 RAMP Report. However, since filing the 2020 RAMP PG&E has revised the scope and pace of the mitigation work and subsequently increased the forecast costs.
- CNTSI – The Contractor Safety Field Inspections program that was included in the 2020 RAMP was removed from the GRC forecast.
- EMPSI - PG&E reduced the scope of the Office Ergonomics and Industrial Athlete Programs since filing the 2020 RAMP. The Mobile Medics program included in the 2020 RAMP is not included in the GRC forecast.

Incorporating Feedback from RAMP

In the GRC PG&E provides more RSEs for mitigations and controls and has also added additional tranches to its Enterprise Risk models.

RAMP Risk	RAMP Mitigations w/ RSE	GRC Mitigations w/ RSE	RAMP Controls w/ RSE	GRC Controls w/ RSE	RAMP Tranches	GRC Tranches
CYBER	1	4	0	4	N/A	2
ITAFL	0	1	0	0	N/A	2
PHYSA	1	2	0	0	N/A	N/A
RECIM	1	4	0	0	N/A	N/A
REFFL	1	2	0	4	50	48

- In response to SPD's feedback from SPD, PG&E updated its 2023 GRC risk model by including the new Oakland 300 Lakeside facility as its own tranche.
- PG&E calculated two RSEs for the REFFL Mitigation (Renovate or Relocate Facilities Other than SFGO): One RSE for Materials Racking and one for Structural and Non-Structure Building.

Incorporating Feedback from RAMP

In the GRC PG&E provides more RSEs for mitigations and controls and has also added additional tranches to its Enterprise Risk models.

RAMP Risk	RAMP Mitigations w/ RSE	GRC Mitigations w/ RSE	RAMP Controls w/ RSE	GRC Controls w/ RSE	RAMP Tranches	GRC Tranches
CNTSI	5	4	0	2	1	1
EMPSI	7	7	0	5	2	4
MTRSI	1	1	0	1	8	8
TPTSI	1	1	0	4	4	8

- TPTSI - Excludes RSEs for mitigations sponsored by other lines of business.

Other Requests

Memorandum Accounts

Wildfire Mitigation Plan Memorandum Account (WMPMA) Cost Recovery for 2020 recorded:

- Enterprise Health and Safety costs for specialized personal protective equipment
- Corporate Real Estate costs for facility emergency generation backup systems
- Land and Environmental Management costs for United States Forest Service hazardous fuel reduction work

Memoranda Of Understanding

- Support for the proposed MOUs with the National Diversity Coalition and the Small Business Utility Advocates groups through programs in our Supplier Diversity Initiative

Internal Accounting Policy Changes

- Commercial cloud services
- Hardware and software maintenance agreements
- Leased fiber-optic circuit implementation costs

Exhibit (PG&E-8)
Human Resources (HR)

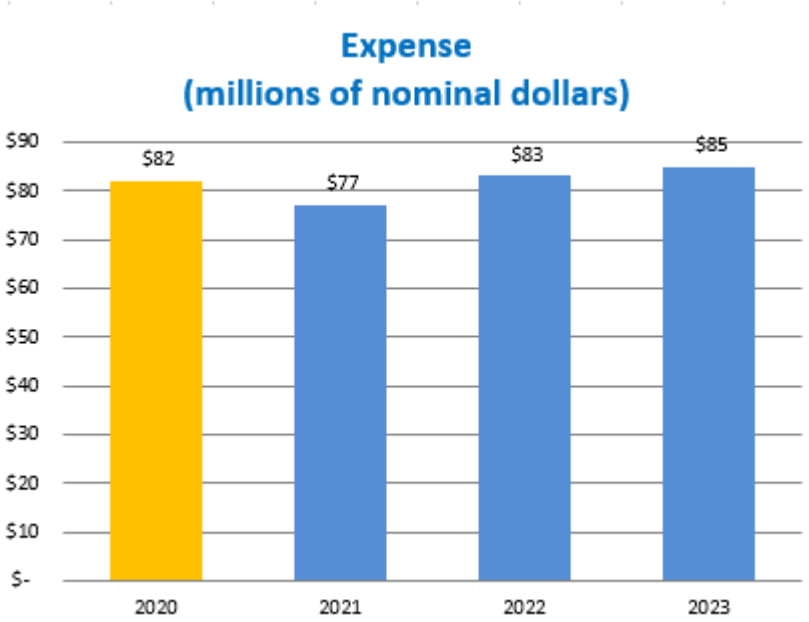
Judith Gutierrez

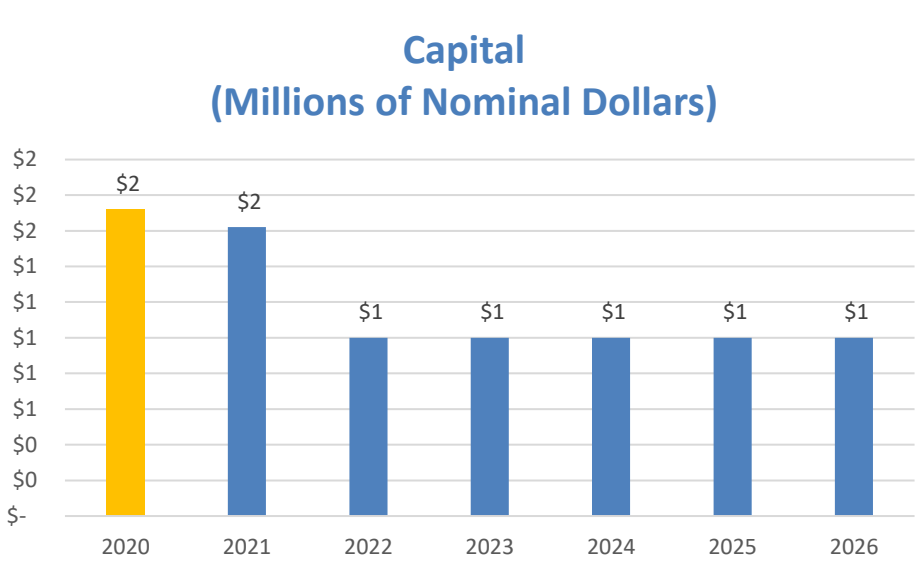
Human Resources,
GRC Case Manager

Human Resources – Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Human Resources Overview	Allison Neves
2	HR Solutions and Services	Bill Pate
3	HR Service Delivery and Inclusion	Glenda Scarbrough
3A	Report on Diversity and Inclusion	Glenda Scarbrough
4	Compensation: STIP, Non-Qualified Retirement and Labor Escalation	Lisa Laanisto
5	Employee Benefits	Allison Neves/Ted Huntley
6	PG&E Academy	Chris Pickett
7	Total Compensation Study	Willis Towers Watson

Summary of Human Resources Forecast Expenses and Capital Expenditures





Key Cost Changes from 2020 Recorded Expenses & Capital Expenditures

HR Organization

Expense: 2020 Recorded – $81.3M; 2023 Forecast - $85.4M; Increase = $4.1M

- Increase primarily due to wage escalation offset by a decrease in contract spend.

Capital: 2020 Recorded – $1.7M; 2023 Forecast - $1.0M; Decrease = $0.7M

- Decrease primarily due to reduction of IT related capital projects.

HR Company-wide Expense: 2020 Recorded – $680.7M; 2023 Forecast - $951.5M; Increase = $270.8M

Increases primarily in the following plans:

- $151M – Lower health care costs in 2020 due to COVID-19 The forecast for Health and Welfare includes escalation and includes an increase for forecast headcount changes.
- $94M – Short Term Incentive Plan (STIP) due to lower pay out in 2020 and headcount increase in 2023.
- $12M – Post Retirement Benefits due to labor escalation and the forecast headcount increase in 2023.
- $11M – Workforce Transition due to lower spending in 2020.

RAMP Risk Update:

- Skilled and Qualified Workforce is a cross-cutting factor in 16 risk models.
- Identified 5 mitigations and 7 controls.
- Mitigations are in planning stages. Scoping potential solutions, as a result the cost for these mitigations are not forecasted in the 2023 GRC.

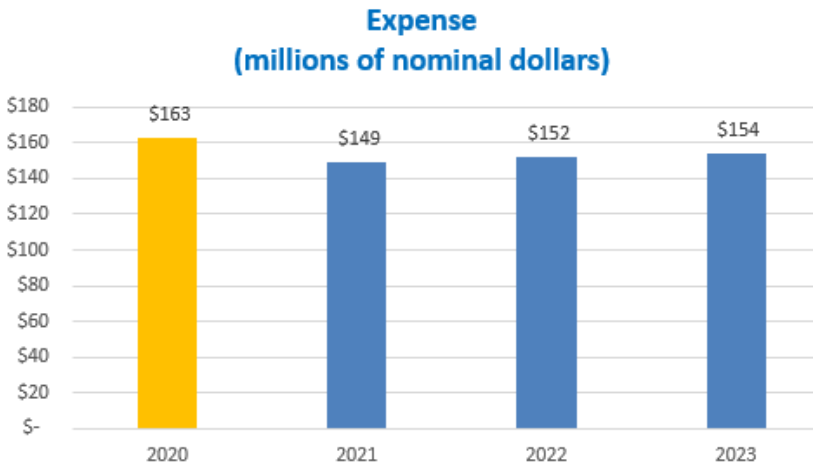
Exhibit (PG&E-9)
Administrative & General

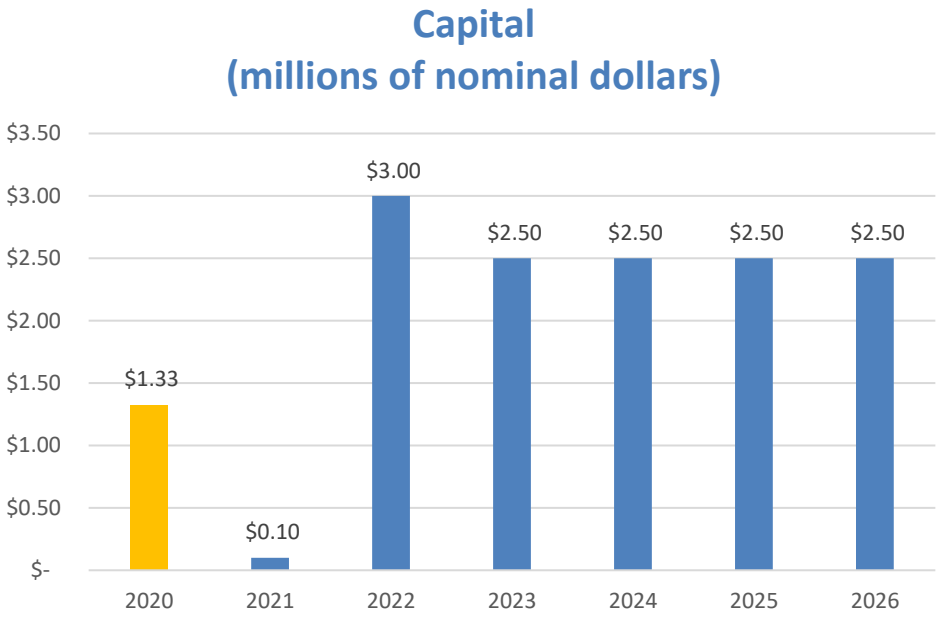
Lauren Hudson
Administrative & General, GRC Case

A&G – Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Introduction	Ivanna Tamburrino
2	Finance Organization Costs	Travis Britanik
3	Risk, Audit, and Insurance Departments	Stephen Cairns
4	Compliance and Ethics	Jennifer Andrews
5	Regulatory Affairs	Megan Lawson
6	Law Organization	Bill Manheim
7	PG&E Corporation and PG&E Executive Offices; and Corporate Secretary Department Costs	Bill Manheim
8	Corporate Affairs Costs	Susan Martinez
9	Administrative and General Ratemaking Adjustments	Ivana Tamburrino

Summary of A&G Forecast Expense and Capital Expenditures





Key Cost Changes from 2020 Recorded Expenses & Capital Expenditures

Expense:

2020 Recorded – $163.2M; 2023 Forecast – $154.2M; Decrease = $9.1M

The 5% decrease is primarily due to reductions in contract and staffing costs, offset by an increase for labor escalation. Total FTE reduction of 13.

Capital:

2020 Recorded – $1.3M; 2023 Forecast – $2.5M; Increase = $1.2M

Increase in Risk, Audit, & Insurance, Compliance & Ethics, and Regulatory Affairs department capital IT costs.

RAMP Risk Update:

- Climate Change is a cross-cutting factor in 13 risk models.
- PG&E's climate resilience work was described in the Company's 2017 and 2020 Risk Assessment Mitigation Phase (RAMP) Reports and will be further informed by the Climate Vulnerability Assessment (CVA) that will support PG&E's 2027 General Rate Case (GRC).

Key Cost Changes from 2020 Company Wide A&G Items

2020 Recorded – $996.5M; 2023 Forecast – $959.6M; Decrease = $36.9M

- The 2020 recorded costs include approximately $360 million of one-time insurance costs that are not expected to recur in 2023. When removed, there is an increase over 2020 Recorded adjusted.
- A primary driver of the corporate items forecast is the continuing high market cost of wildfire liability insurance along with cost increases for various other insurance types.
- PG&E's wildfire insurance forecast is based on the cost of its most recent renewal from April 2021, which is the most recent cost data available.
- Consistent with previous Commission guidance, PG&E has included only 50 percent of the forecast cost of Directors and Officers insurance in its 2023 forecast.

Liability Insurance Key Items

Key Changes from 2020 GRC

- Separate wildfire and non-wildfire liability insurance.
- Revision to Risk Transfer Balancing Account (RTBA) to align with the procurement changes to the Company's wildfire and non-wildfire liability insurance programs.
- Proposes to allocate wildfire liability insurance costs to the electric function (see illustrative table on next slide).

Wildfire Liability Insurance Forecast

- 2023 Forecast for wildfire coverage of up to $1 billion = $707 million, consistent with Wildfire Fund requirements.
- Self-insurance options:
  - (1) (Recommended) The $707 million wildfire liability revenue requirement would be bifurcated into two parts: (1) a $250 million revenue requirement to be used only for self-insurance; and (2) a separate $457 million revenue requirement for procurement of additional wildfire insurance up to an amount that would secure a total of $1 billion in wildfire coverage for the year including self-insurance.
  - (2) Continue 2020 GRC Settlement self-insurance mechanism whereby any unspent authorized wildfire liability insurance revenue requirements would be available for up to $1 billion in coverage

Liability Insurance Key Items - Continued

Liability Insurance Allocations Illustration

2023 and Beyond Non-Wildfire Liability Insurance		2023 Wildfire Liability Insurance Cost Allocation[1]		2024 and Beyond Wildfire Liability Insurance Cost Allocation[2]	
Electric Distribution	40%	Electric Distribution	83%	Electric Distribution	72%
Electric Transmission	16%	Electric Transmission	17%	Electric Transmission	28%
Generation	19%				
Gas Distribution	16%				
GT&S	10%				

1-Aligns with Transmission Owner Rate Case allocation that is effective through the end of 2023.
2-The allocation factors would be updated annually to align with the annual FERC formula update process. To the extent FERC adopts a different allocation than the one PG&E proposes here, PG&E would update the allocation it uses annually to be consistent with the one adopted by the FERC.

Exhibit (PG&E-10)
Results of Operations

Shetal Chaturvedi

GRC Case Manager,
Results of Operations

Results of Operations – Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Introduction	Divya Raman
1A	Cost Allocation	Bruce T. Smith
2	SAP FERC Translation	Bryan G. Wong
3	Electric Distribution O&M Expense	Bryan G. Wong
4	Gas Distribution O&M Expense	Bryan G. Wong
5	Customer Accounts Expense	Bryan G. Wong
6	Generation O&M Expense	Bryan G. Wong
7	Gas Transmission and Storage O&M Expense	Bryan G. Wong
8	Administrative and General Expenses	Ivana E. Tamburrino
9	Payroll and Other Taxes	Sanjay Solanki

Results of Operations – Exhibit Structure

Chapter No.	Chapter Name	Witness
10	Electric, Gas, and Common Plant	Pei Sue Ong
11	Depreciation Reserve and Expense	Beatrix Greenwell
12	Depreciation Study	Ned Allis
12A	Gas Throughput Data	David B. Sawaya
13	Income and Property Taxes	Jack A. Battin
14	Working Cash	Paul Hunt
15	Gas and Electric Distribution and Generation Rate Base	Pei Sue Ong
16	Other Operating Expenses	Jenny Garboden
17	Calculation of Revenue Requirement	Divya Raman

2023 GRC RO Model Data Flow

RO Inputs Supported by

Cost Witnesses
Exhibits (PG&E-3) - (PG&E-9)

Capital and Expense

Tax Witness
Exhibit (PG&E-10)

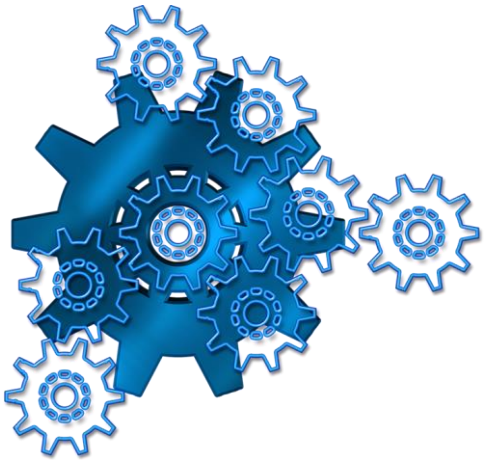
Global Items Witnesses
Exhibit (PG&E-10) & Exhibit (PG&E-12)

Escalation Rates, Depreciation Rates, Working Cash, Cost of Capital, etc.

Attrition Witness
Exhibit (PG&E-11)

Attrition Proposal and Methodology

RO Model
Exhibit (PG&E-10)



RO Output

Revenue Requirement

E + D +T + r(RB)

E = Expenses
D = Depreciation
T = Income Taxes
r = Return on Ratebase
RB = Ratebase

Test Year – 2023
Attrition Years – 2024, 2025 & 2026

Revenue Requirement – Lines of Business (LOB) Mapped to GRC Functional Areas

Line of Business		Direct Costs			Allocated & Direct-assigned Costs	Allocated Costs		
		(PG&E-3) Gas Operations	(PG&E-4) Electric Distribution	(PG&E-5) Energy Supply	(PG&E-6) Customer and Communications	(PG&E-7) Shared Services and Information Technology	(PG&E-8) Human Resources	(PG&E-9) Administrative and General
GRC Functional Area	Electric Distribution		✓		✓	✓	✓	✓
	Gas Distribution	✓			✓	✓	✓	✓
	Electric Generation			✓	✓	✓	✓	✓
	Gas Transmission & Storage	✓			✓	✓	✓	✓

- New testimony regarding allocation of costs to PG&E's functional areas is provided in Exhibit (PG&E-10) Chapter 1A

Summary of 2023 GRC Test Year Revenue Requirements

GRC Functional Areas	2022 GRC Adopted ($M)	2023 GRC Proposed ($M)	Difference from Adopted ($M)
Electric Distribution	$5,514	$8,171	$2,657
Gas Distribution	2,321	2,870	550
Electric Generation	2,404	2,431	26
Gas Transmission and Storage	1,662	1,989	327
Total GRC	$11,901	$15,461	$3,560

Exhibit (PG&E-11) Post Test-Year Ratemaking

Anthea Ma,

GRC Case Manager, Post Test-Year Ratemaking

Post Test-Year Ratemaking (PTYR) – Exhibit Structure

Chapter No.	Chapter Name	Witness
1	Post Test-Year Ratemaking Proposal	Pei Sue Ong
2	Attrition and Proposed Attrition Changes	Pei Sue Ong
3	Rate Base Growth in Attrition Years and Related Costs	Pei Sue Ong

Post Test-Year Ratemaking Proposal

EXPENSE

- Escalation of adopted test-year expenses
  - Wage escalation rates; materials and services (non-labor); medical plan cost; other
- Discrete adjustments (bottom-up forecast)
  1. Gas Storage costs
  2. Vegetation Management increase
  3. Nuclear Generation decrease
  4. Customer Care mandatory transition to revised Time-of-Use periods and Peak-Day Pricing hours costs
  5. Healthcare and other A&G corporate items decrease
  6. Wildfire excess liability insurance costs

CAPITAL

- Escalation of adopted test-year additions
- Discrete capital expenditures forecast adjustments (bottom-up forecast)
  1. Gas Storage
  2. Nuclear Generation decrease
  3. Hydroelectric Generation
  4. Corporate Real Estate
- Other rate base post test-year revenue adjustments in Gas Storage, Gas Distribution, and Nuclear Generation

Proposed 2023 GRC Post Test-Year Revenue Requirements

Estimated PTYR adjustments based on PG&E's test-year forecast:

2023 GRC Revenue Requirement Forecast	$15,461	million		
2024 Attrition Increase	930	million	→	6% increase
2024 GRC Revenue Requirement Forecast	$16,391	million		
2025 Attrition Increase	590	million	→	4% increase
2025 GRC Revenue Requirement Forecast	$16,981	million		
2026 Attrition Increase	381	million	→	2% increase
2026 GRC Revenue Requirement Forecast	$17,363	million		

Discovery Process

Propounding Data Requests

- Send all data requests to GRC@pge.com
- PG&E targets response within 10 business days

Internet Access for Data Requests

- Create an account and log-in at https://pgera.azurewebsites.net/account/login

Confidential Material

- To obtain a Non-Disclosure Agreement, contact GRC@pge.com (Once completed – request material through mailbox above)

Thank you

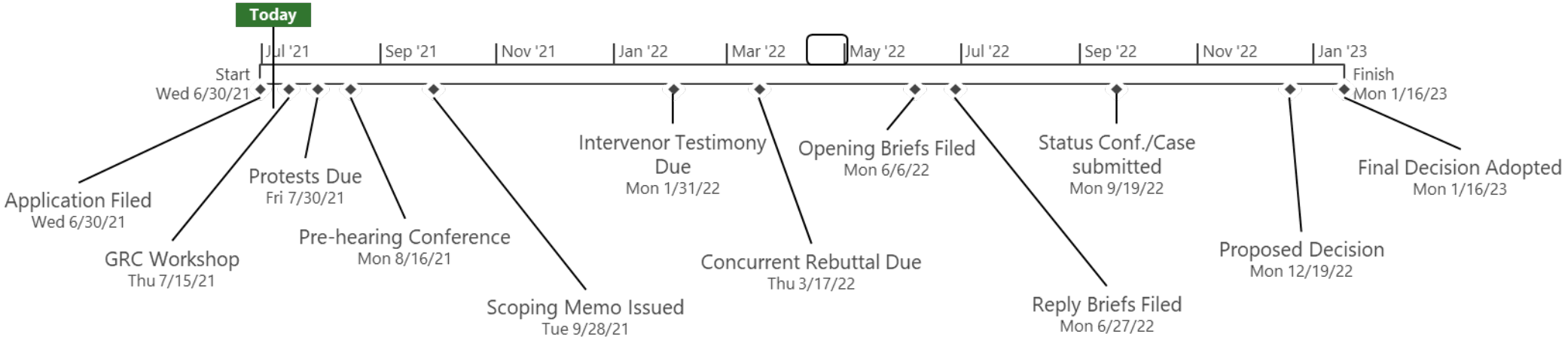
Shilpa Ramaiya
Shilpa.Ramaiya@pge.com

Mary Gandesbery
Mary.Gandesbery@pge.com

Conor Doyle
James.Doyle@pge.com

Next Steps

- Assigned Commissioner and Administrative Law Judge (ALJ) to be assigned
- Email CPUC at processoffice@cpuc.ca.gov to get on the A.21-06-021 service list
- Questions and issues not addressed today can be emailed to Tom Roberts, or submitted to PG&E via data request, GRC@PG&E.com
- Protests due approximately July 30, 2021
- Prehearing Conference approximately August 16, 2021
- Scoping Memo with final schedule due approximately September 28, 2021



Questions?

Tom Roberts, thomas.roberts@cpuc.ca.gov