

2022

BUDGET AND GRID MANAGEMENT CHARGE RATES

Prepared by the Financial Planning and Procurement Department
California Independent System Operator Corporation



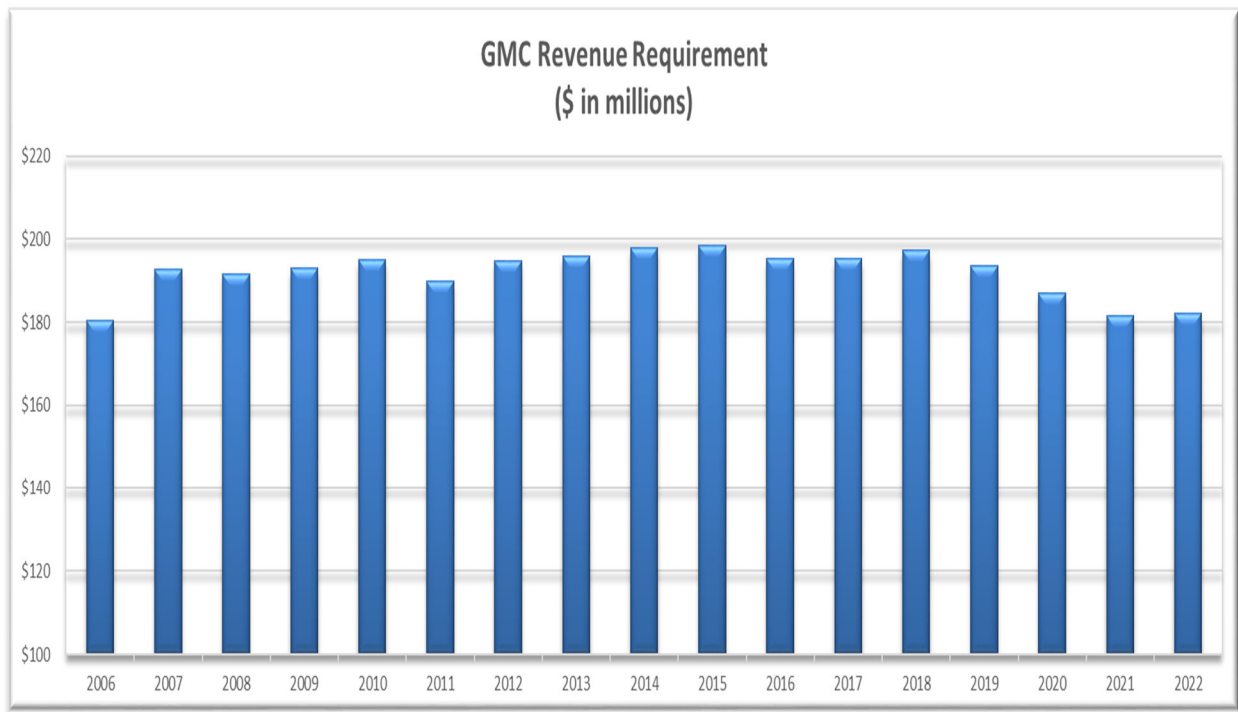
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I. 2022 GMC Revenue Requirement Summary

The proposed 2022 grid management charge (GMC) revenue requirement, the means in which the California Independent System Operator Corporation (ISO) recovers its net operating costs, is \$182.1 million. The operations and maintenance (O&M) component of the revenue requirement is 4% higher than 2021 primarily due to higher labor costs. Approximately half of the increase represents funding for 22 additional positions intended to address strain points within the organization in response to feedback from stakeholders. Additionally, the merit and promotion budget represents the remainder of the increase. Despite the increases in the O&M budget, the net revenue requirement remains relatively flat due to a combination of lower expenses and greater revenue in the other components as detailed later in this document.



Fiscal discipline remains a priority for the ISO, as evidenced by the continued reasonable stability of the GMC revenue requirement. The ISO has absorbed several major initiatives over the recent years with no material impact to the GMC revenue requirement. The initiatives include launching the market redesign and technology upgrade (MRTU), constructing its secure primary and secondary locations, implementing the energy management system (EMS), as well as launching the Western Energy Imbalance Market (EIM) and reliability coordinator services (also known as RC West).

The recent declining trend in the net revenue requirement is a function of other offsetting revenue growing at a pace faster than expense inflation. While the ISO does not expect that trend to continue, it is committed to continued disciplined growth of the revenue requirement in the future.

Components of 2022 GMC Revenue Requirement

A summary of the 2022 GMC revenue requirement compared to 2021 follows.

GMC Revenue Requirement (\$ in millions)	2022 Budget	2021 Budget	Change \$	Change %
Operations & Maintenance Budget	\$209.8	\$200.8	\$9.0	4%
Debt Service (including 25% reserve)	14.7	16.9	(2.2)	-13%
Cash Funded Capital	30.0	28.0	2.0	7%
Other Costs and Revenues	(53.2)	(50.5)	(2.7)	5%
Operating Cost Reserve Adjustment	(19.2)	(13.6)	(5.6)	41%
Total GMC Revenue Requirement	\$182.1	\$181.6	\$0.5	0%
Transmission Volume Estimate in TWh	233.5	237.3	(3.8)	-2%
Pro-forma bundled cost per MWh	\$0.7799	\$0.7653	\$0.0146	2%

The operations and maintenance (O&M) budget is the largest component of the GMC revenue requirement; therefore, managing it is critical to keeping a stable revenue requirement. The \$9.0 million projected increase in the O&M budget is primarily due to budgeted merit and other compensation increases, additional headcount, additional consultant and contract staff as well as higher insurance premiums. The budgeted headcount will increase by 22 to 691.

Despite the increases in the O&M budget, the overall GMC revenue requirement will see a nominal increase of \$0.5 million over 2021 as the operating cost reserve adjustment credit will increase by \$5.6 million. In addition, other revenue is budgeted to increase by approximately \$2.7 million and debt service will decrease by \$2.2 million in 2022.

The ISO projects that the 2022 transmission volumes will be 233.5 TWh, which is a decrease from projected 2021 volumes. The projected volumes are based on the three-year average of actual measured demand volumes as well as year-to-date 2021 volumes. Dividing the GMC revenue requirement by the projected volumes results in a pro-forma bundled cost per megawatt-hour (MWh) of \$0.7799, or a 2% increase over 2021.

The pro-forma bundled cost per MWh does not represent a single charge that the ISO uses, but is intended rather to represent a combination of charges a market participant could expect to pay if they utilized all of our grid management services, including: market services, system operations, and congestion revenue rights services. See Section X at the end of this document for the actual calculation of the rates.

II. Budget Overview

This budget package consists of the following items:

- O&M budget (Sections III thru V)
- Debt service costs (Section VI)
- Capital / project funding and cash-funded capital (Section VII)
- Other costs and revenues (Section VIII)
- Operating cost reserve adjustment (Section IX)
- Grid management charge components (Section X).

The O&M budget, the primary focus of this report, is the largest of these components and consists of the costs incurred for annual operations. The 2022 O&M budget of \$209.8 million is \$9.0 million greater than the 2021 O&M budget of \$200.8 million. The O&M budget is presented in three separate views as noted below:

- By process — e.g., support customers and stakeholders (Section III)
- By resource — e.g., salaries and benefits (Section IV)
- By function — e.g., operational services (Section V).

Debt service costs are the principal and interest payments related to the 2021 bonds, and the collection of a 25% debt service reserve. The 2021 bonds refinanced the 2013 bonds which the ISO issued to build a new headquarters facility in Folsom, California and funded

other capital expenditures. The total debt service to collect in the 2022 GMC revenue requirement will be \$14.7 million, a reduction of \$2.2 million.

Cash-funded capital included in the GMC revenue requirement is \$30 million with any unencumbered amounts carried over to fund future years' capital requirements. Collecting capital as a component of the GMC revenue requirement avoids the additional costs associated with debt financing, including issuance costs, interest expense, and debt service reserves. The capital / project requirements for 2022 are projected to be between \$18 million and \$20 million.

Other costs and revenues are net revenues received from sources other than the GMC and reduce the overall GMC revenue requirement. They are budgeted to increase \$2.7 million in 2022 to \$53.2 million. These other revenues include items such as EIM administrative charges, reliability coordinator funding requirement, intermittent resource forecasting fees, interest earnings, California-Oregon intertie path operator fees, generator interconnection fees, and the nodal pricing model fee.

The operating cost reserve adjustment is a credit of \$19.2 million in 2022; the credit is primarily due to favorable operations in 2020. In any year that the ISO operating reserve account exceeds 15% of the prospective year's O&M budget, the excess reduces the GMC revenue requirement for the following year. This adjustment also includes the 25% debt service reserve collected in 2021 and the difference between the budgeted and actual revenues and expenses from 2020.

Budget Guidance

The ISO's budget is collaboratively developed using feedback from its stakeholders and leadership team. The ISO held its initial 2022 stakeholder meeting in July 2021 to allow for stakeholder input prior to developing the 2022 budget; a follow up meeting is scheduled for November 2021. Notes from both meetings will be made available on the ISO website¹.

The 2022 GMC revenue requirement will be brought to the Board of Governors for decision during the December 2021 board meeting.

¹ The 2022 Budget and Grid Management Charge documentation and stakeholder feedback is available on the ISO website at <https://stakeholdercenter.caiso.com/RecurringStakeholderProcesses/Budget-grid-management-charge-process--2022>

Following its firm commitment to fiscal responsibility, the ISO utilizes the Zero-Based Budgeting (ZBB) method to develop its O&M budget. ZBB confronts conventional thinking and resource allocations by challenging every line item and assumption. Budget requests under the ZBB method require justification, which helps us avoid over-budgeting, double counting, and automatic budget increases. The result is a well-justified and balanced budget, which is strategically aligned with the ISO's focus going into the year.

The combined efforts contributed to the 2022 GMC revenue requirement to come in at \$182.1 million, approximately \$19.9 million less than the FERC approved \$202 million cap. The budget funds operations and initiatives that are set forth in the ISO vision as described below.

Strategic Outlook

The ISO's strategic objectives include reliably operating the grid, efficiently operating ISO markets, and continuing the pursuit of organizational excellence.

Our top priority remains managing a highly reliable electric grid in an efficient, non-discriminatory way, using our market to provide customers with the best value from transmission and generation resources. As the grid continues to evolve and the Western energy market expands, it is crucial that we continue to maintain and grow the confidence of stakeholders, participants and policy makers in the performance, quality and integrity of the ISO market.

Aligning with the ISO's Vision

The ISO remains committed to supporting growth and change while carefully managing its operating costs. Over the past several years, the ISO has enhanced the grid to become more flexible and adaptable, as very low and zero-carbon resources are added to the system to meet state clean air and water goals.

The budget aligns with the ISO's Strategic Vision, which is a guide to meet organizational and operational goals. The plan contains the following strategies:

1. Reliable management of the grid,
2. Efficient operation of the ISO markets, and

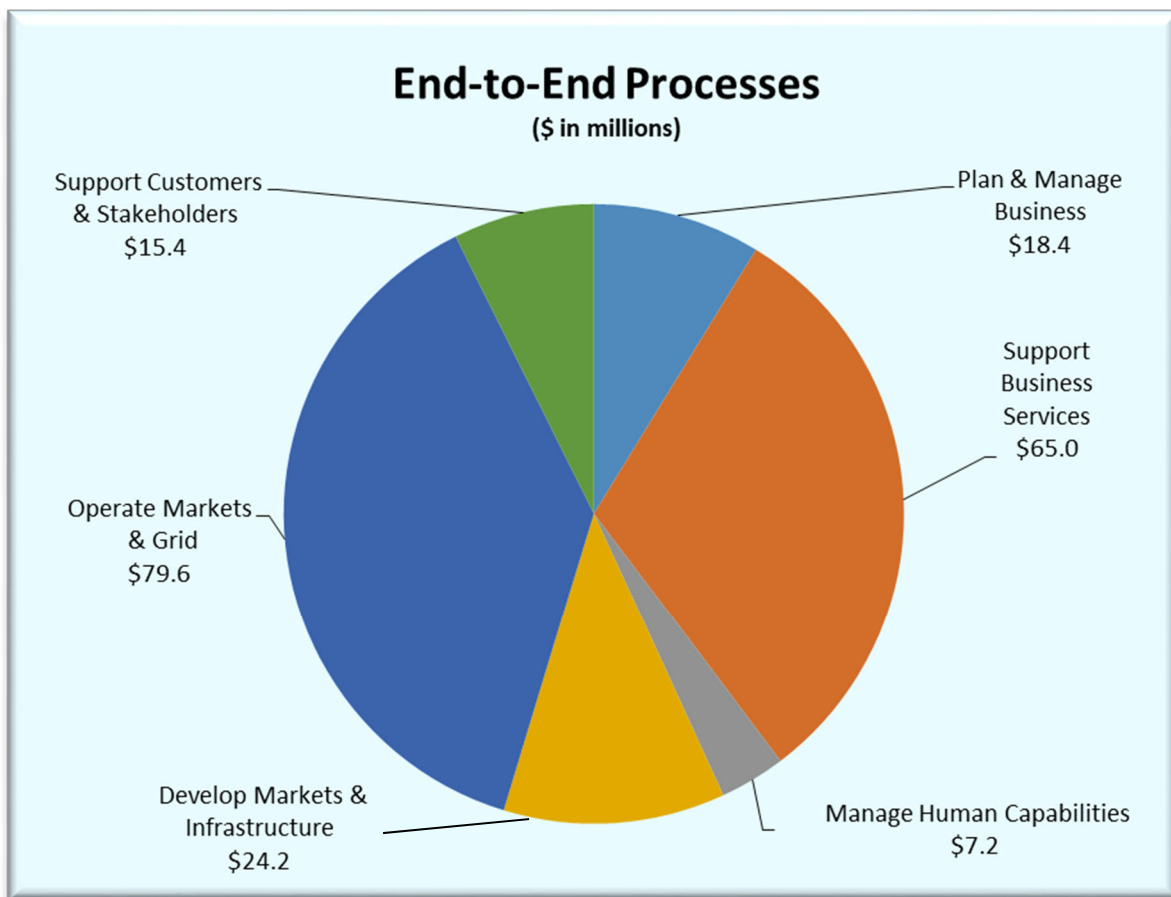
3. Continued pursuit of operational excellence.

The Strategic Vision provides employees and managers our common goals while the budget explains how the corporation funds and allocates its resources to support its business plans. The budget is built upon a balanced mix of staffing, skills and financial resources.

Aligning the strategic planning process with budget planning provides greater transparency into the ISO's resources and business and operation costs. The ISO remains steadfast in its efforts to manage costs and utilize corporate resources in a smart and prudent manner.

III. O&M Budget - Process View

The ISO uses an activity-based costing system to provide greater transparency and granularity in how the budget supports corporate efforts. In support of this system, all employees record time worked each week to activities that roll-up to the six primary processes described below. Aggregating the time reported by employees results in percentages for



each of the processes that represent the percentage of total resources spent on that process. Using the hours from the first nine months of 2021, the resulting percentages are then applied to the 2022 O&M budget. The results represent the costs for the six processes as shown below.

Plan and Manage Business

The **plan and manage business** process amounts to 9% of the O&M budget, and consists primarily of the activities related to strategic planning, governance, financial planning and project management.

Support Business Services

The **support business services** process amounts to 31% of the O&M budget, and is comprised primarily of the activities related to information technology, financial, legal and compliance support services.

Manage Human Capabilities

The **manage human capabilities** process amounts to 3% of the O&M budget, and consists of five primary end-to-end processes that combine to ensure the ISO attracts and retains the skills and talent necessary to achieve business objectives. The processes are compensation, benefits, recruitment, training and development, and employee relations.

Develop Markets and Infrastructure

The **develop markets and infrastructure** process group amounts to 12% of the O&M budget, and includes two separate processes that support the creation of value-added enhancements to the market design, as well as to proactively plan and facilitate grid upgrades. Activities in these processes include the review and analysis of the efficiency and quality of market results, identifying needed market design improvements, and transmission and generation interconnection planning.

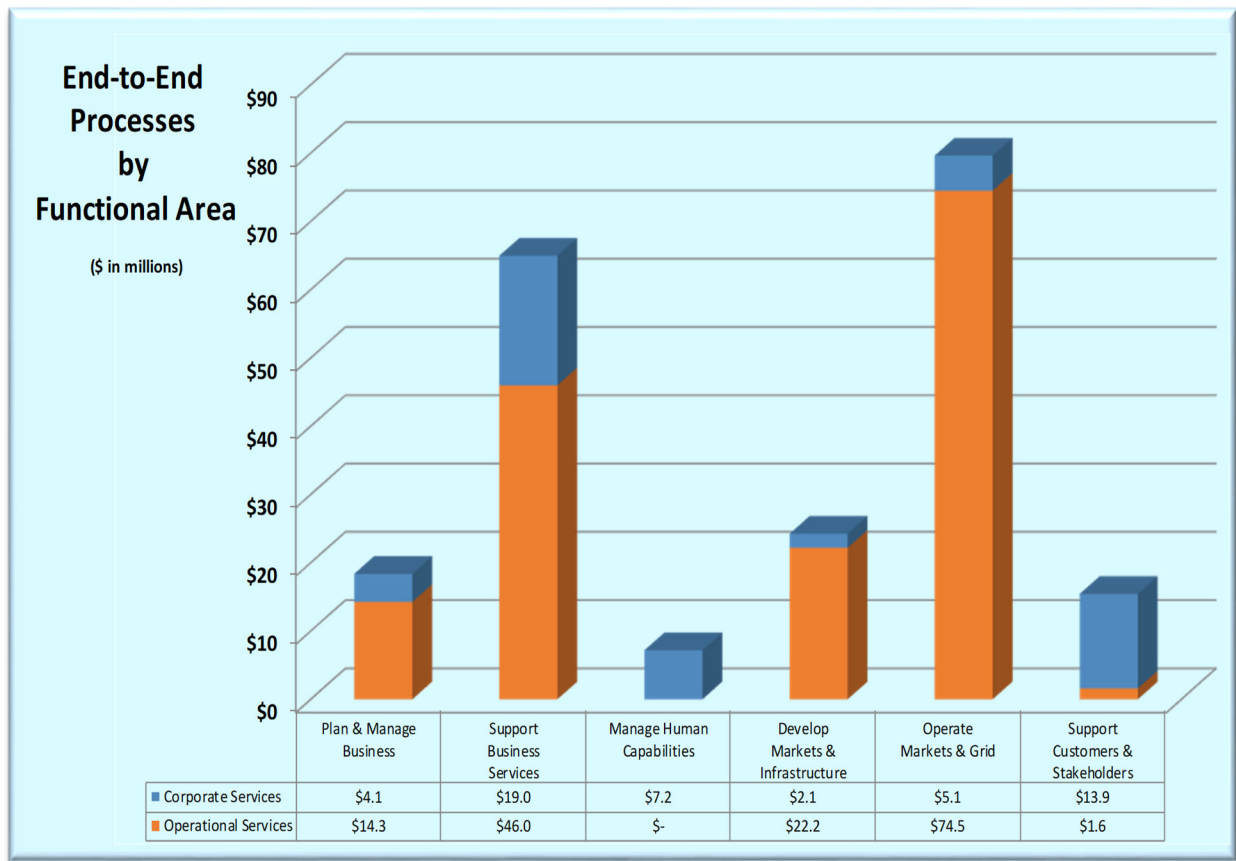
Operate Markets and Grid

The **operate markets and grid** process group amounts to 38% of the O&M budget, and includes three separate processes: 1) manage market and reliability data and modeling; 2) manage markets and grid; and 3) manage operations support and settlements.

Support Customers and Stakeholders

The **support customers and stakeholders** process amounts to 7% of the O&M budget, and consists primarily of the activities related to client and account management, stakeholder processes, government and regional affairs, and communications.

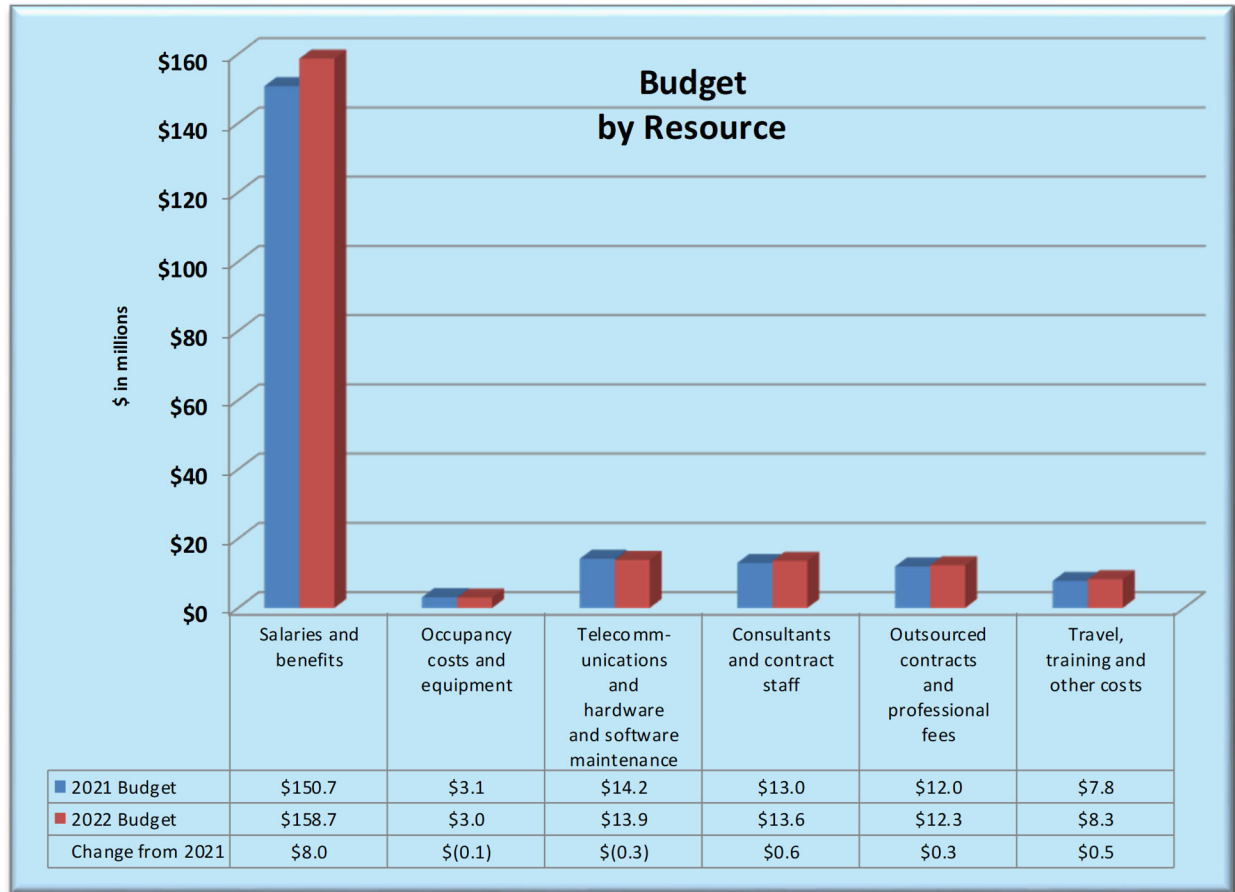
A look at how the process costs are allocated by function follows.



IV. O&M Budget - Resource View

This section views the O&M budget in the traditional resource categories in which expenses are classified. The 2021 budget reflects reclassifications in order for it to be comparable to the 2022 budget presentation.

The chart below shows the major resource components.



Salaries and Benefits

The ISO depends on its highly educated and experienced employees to operate the grid and support market functions, which makes staff a critically important resource. To that end, the salaries and benefits category comprises 76% of the 2022 and 75% of the 2021 budgets.

The staffing plan concentrates on attracting and retaining the best and brightest individuals in the industry. At times, the ISO revises the organizational structure to help keep pace with

changing resource needs. The ISO also makes periodic organizational changes to align resources to focus on the important matters identified in the company's Strategic Vision, and better reflect end-to-end business processes.

The budgeted staffing level for 2022 is 691 employees, which is an increase of 22 positions over the 2021 budgeted staffing level. The 2022 staffing level increase addresses the needs for additional assistance communicated by ISO Management and Stakeholders in multiple divisions (as illustrated in the projected staffing levels chart below).

A summary of the budgeted headcount for 2022 and 2021 is as follows.

Projected Staffing Levels*	2022 Budget	2021 Budget	Change
Corporate Services			
Chief Executive Officer	20	18	2
Finance	21	21	-
Human Resources	17	17	-
General Counsel	36	35	1
External Affairs	18	18	-
Stakeholder Engagement and Customer Experience	25	23	2
Sub-Total	137	132	5
Operational Services			
Chief Operating Officer	84	118	(34)
Infrastructure and Operations Planning	109	106	3
Power Systems and Market Technology	138	100	38
System Operations	171	168	3
Market Policy and Performance	52	45	7
Sub-Total	554	537	17
Gross Headcount	691	669	22
Less Program Office Staff Included in Capital	(5)	(5)	-
Net Headcount	686	664	22

*For permanent and temporary positions.

The 2022 budget includes a 1% vacancy factor discount in the salary budget for selected divisions that experience higher vacancies throughout the year.

Staffing Related to Capital

As in past years, the O&M budget does not include the costs of full-time equivalent (FTE) staff dedicated to capital projects, which are included in the capital budget. The capitalizable expense related to the FTE is equivalent to five full-time staff in the Chief Operating Officer (COO) division's Enterprise Program Management Office. The cost of other staff engaged in capital projects is budgeted in their respective cost centers; however, the financial statements that are prepared in accordance with generally accepted accounting principles include the capitalization of this labor.

Compensation Structure

The compensation budget includes funding for employee base salaries, payroll taxes, and healthcare benefits; as well as other compensation elements, such as overtime, performance compensation, relocation reimbursement and tuition reimbursement. The budget also includes funds for salary adjustments for merit, equity and market adjustments. These costs have been budgeted for each position.

In setting the annual merit, equity and market adjustments budget, the Human Resources department participates in salary surveys administered by qualified third-party vendors. These vendors confidentially gather information related to competitive market pay rates. The ISO's ability to attract and retain talent with the necessary skills and knowledge directly links to our ability to maintain competitive pay practices.

The total compensation packages provided to employees include performance compensation with payouts in the subsequent year based on individual and corporate performance.

A summary of the compensation components is as follows.

Compensation Components With Benefit Burden (\$ in millions)	2022 Budget	2021 Budget	Change
Base Compensation	\$129.5	\$122.7	\$6.8
Overtime (includes structured overtime for grid operators)	\$8.1	8.0	0.1
Performance Compensation	\$19.1	18.0	1.1
Other	\$2.0	2.0	0.0
Total Personnel Expense	\$158.7	\$150.7	\$8.0

The 2022 employee benefits burden will reduce from 36% to 34.5% of salary costs as summarized in the table below. There are a few drivers helping the ISO to achieve a lower overall benefit burden rate. These drivers include improved claims history, improved cost controls achieved thru the self-funded insurance program, minimal premium increases offered through some benefit providers, and leveraging the self-funded healthcare reserve to help offset some premium costs. The ISO will continue to manage contracts, prudently, to ensure these benefits are available to eligible employees with the costs primarily depending on employee population levels and participation.

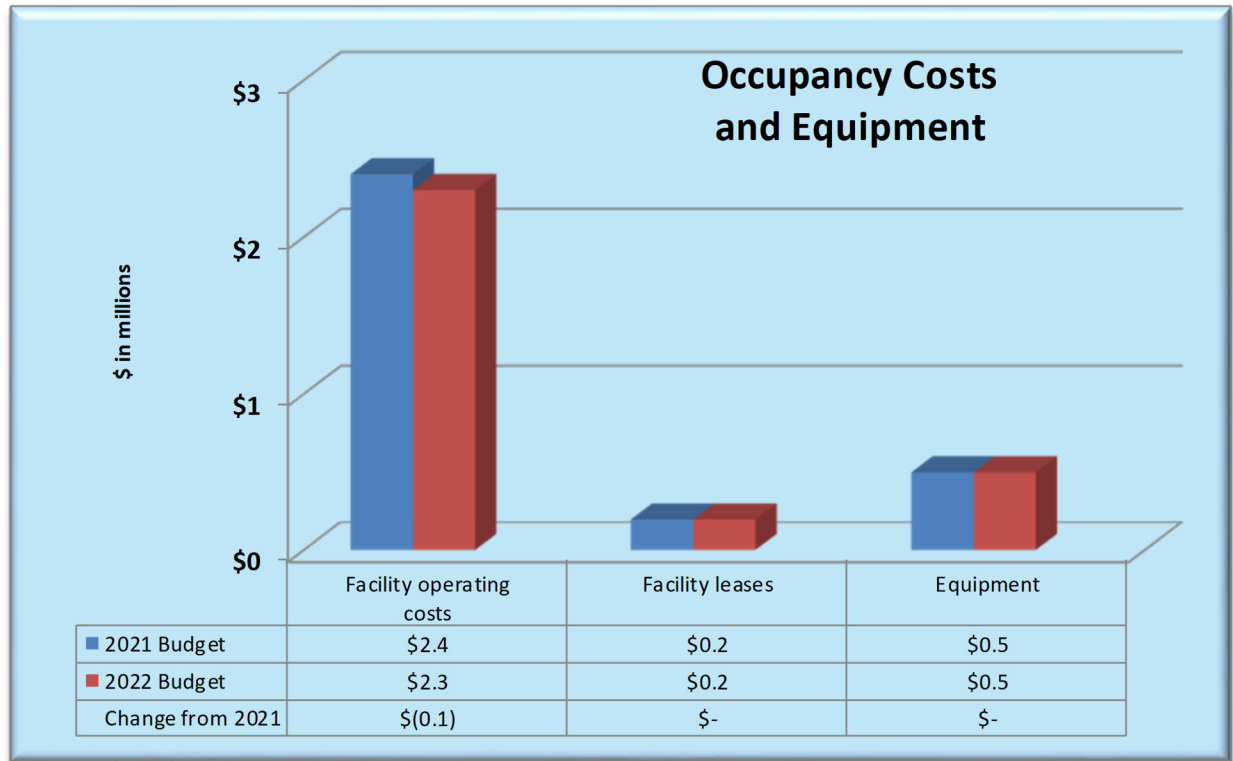
The benefits burden is broken down as follows.

Benefit	Components	Rate
Health, Welfare, and Other Plans	Medical, dental and vision insurances. Also includes employee assistance program, life insurance, accidental death insurance, long-term disability insurance, and worker’s compensation.	11.5%
Payroll Taxes	Social security, medicare, unemployment insurance, employment training and disability insurance.	9.0%
Retirement Benefit Plans	Retirement savings benefit plan (401(k)) and executive retirement plans.	14.0%
Benefit Burden Rate		34.5%

Occupancy and Equipment

Occupancy and equipment costs will decrease by \$0.1 million to \$3.0 million for 2022. These costs represent 1% of the 2022 and 2% of the 2021 budgets.

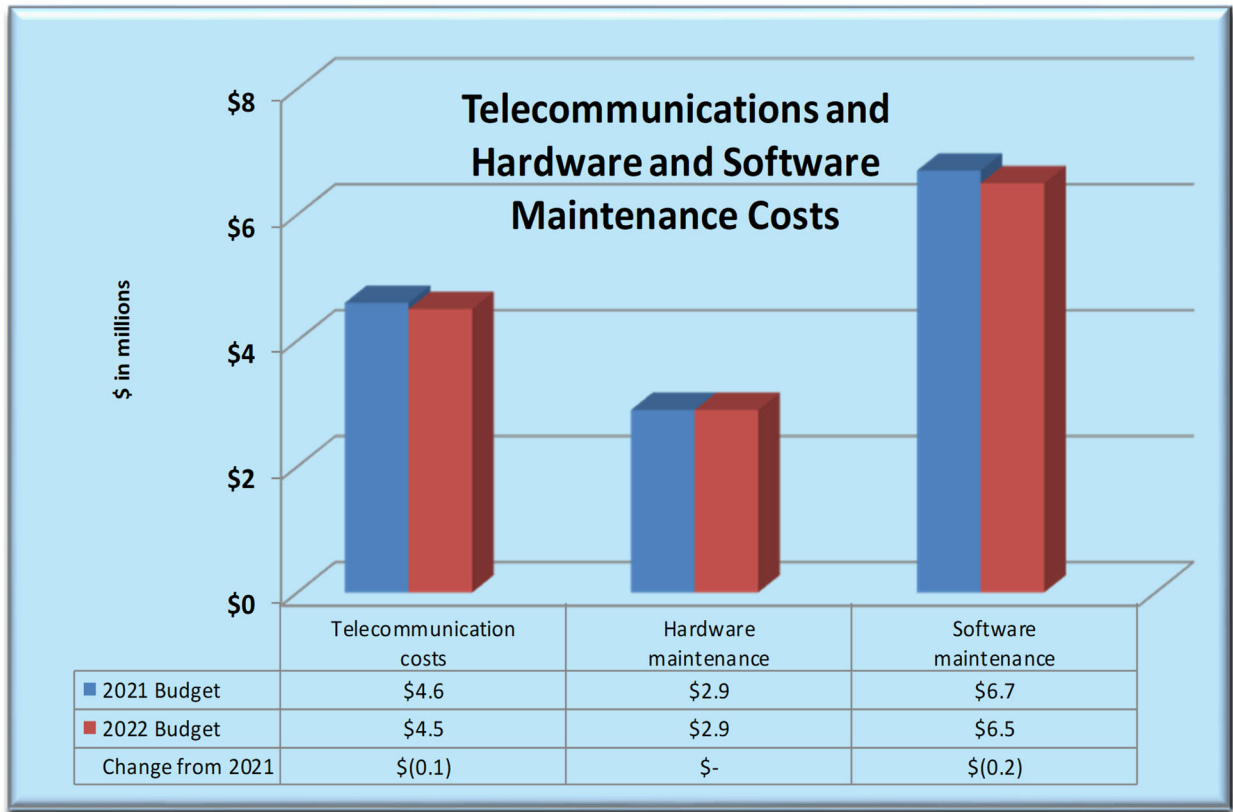
This resource category consists of the various ongoing costs to operate the facilities and related equipment.



The nominal decrease in facility operating costs is due to reduced negotiated rates with service vendors.

Telecommunications and Maintenance

Telecommunications and maintenance costs will decrease by \$0.3 million to \$13.9 million for 2022. These costs represent 7% of the 2022 and 2021 budgets.

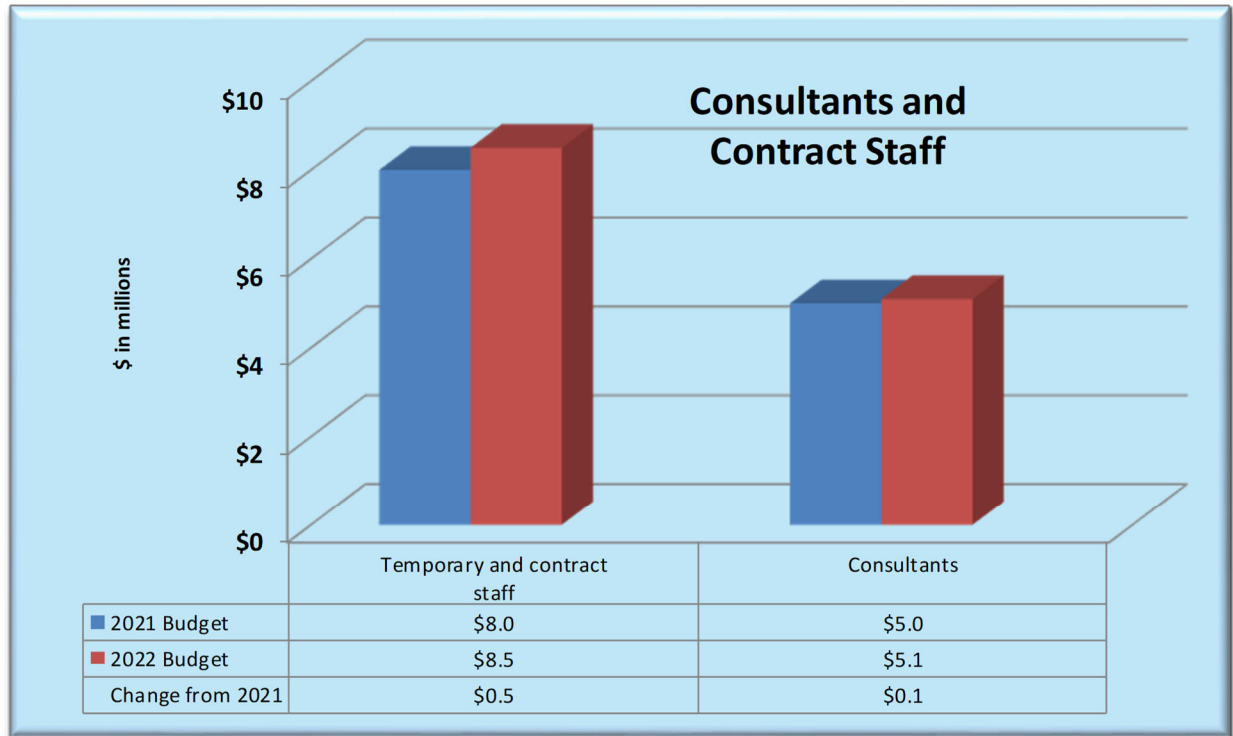


Telecommunication costs, which include wired and wireless services, will decrease nominally for 2022. The decrease is primarily due to reduced negotiated rates for services. Hardware maintenance costs will remain unchanged for 2022.

Software maintenance costs, which are primarily licensing fees, will decrease \$0.2 million for 2022. The decrease is primarily due to transition to subscription-based licenses.

Consultants and Contract Staff

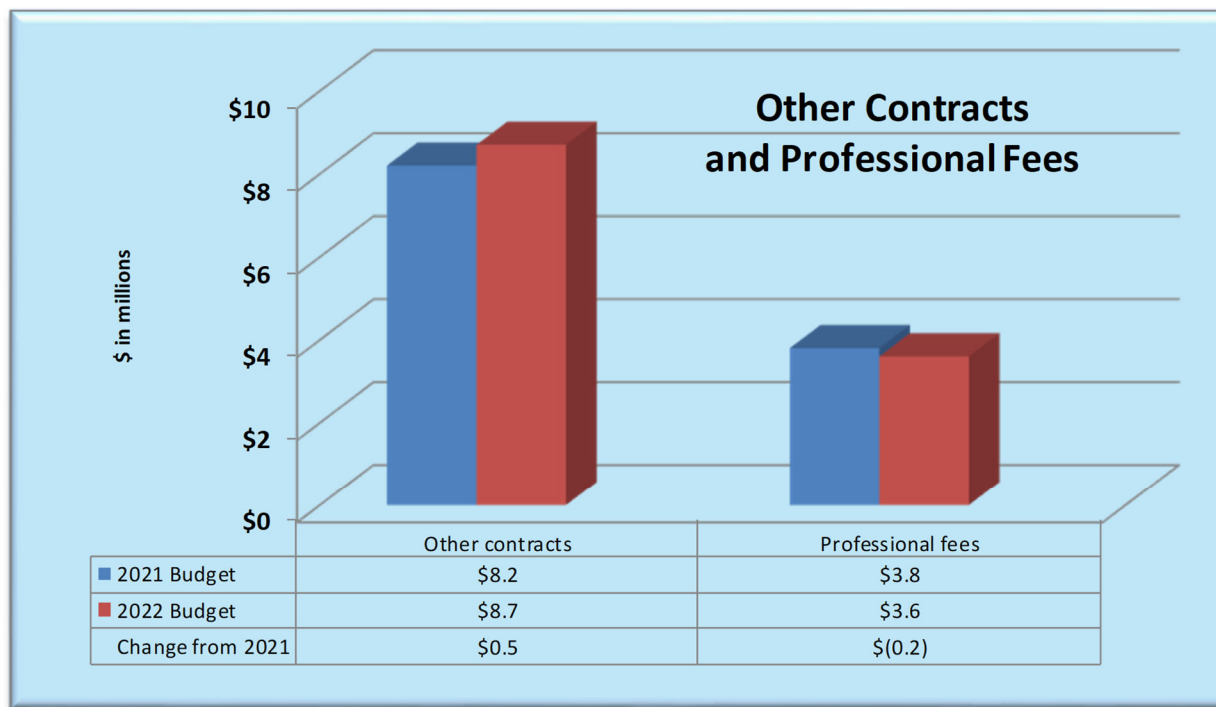
Consulting and contract staff costs will increase by \$0.6 million to \$13.6 million for 2022. The consulting and contract staff budgets represent 6% of the 2022 and 2021 budgets.



The ISO regularly evaluates how to meet its responsibilities while remaining cost-effective and providing the highest service quality whether through hiring full-time employees or using outside resources (e.g., contractors, consultants or temporary staff). At times, the ISO may bring contractor work in-house when it is of an ongoing nature and lowers the overall cost with the same or better service quality. Examples of efforts requiring budget in 2022 include resource adequacy studies, process assessments, training, day-ahead-market studies, technology and operations applications maintenance, and the need for subject matter experts in various fields such as renewable integration.

Other Contracts and Professional Fees

Outsourced contracts and professional fees will increase by \$0.3 million to \$12.3 million for 2022. The budget category represents 6% of the 2022 and 2021 budgets.



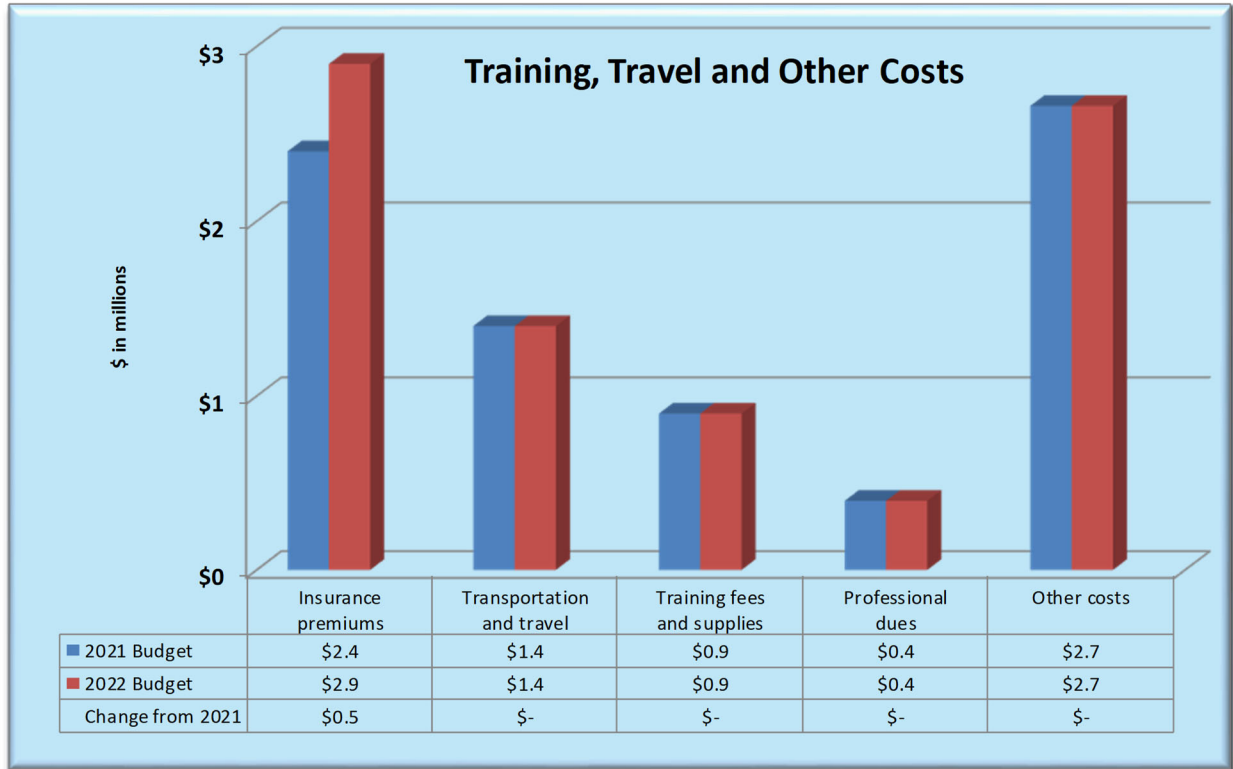
Other contracts, which represent contracts with third-party vendors for services, will increase by \$0.5 million in 2022. One driver being the addition of tools needed to support RC functions. Another driver is transition to subscription-based licenses for applications.

A large component of the other contracts resource category is our forecasting costs. Intermittent resources pay a forecasting fee to the ISO of \$0.10 per megawatt hour of generation. These fees, collected from the variable resources, are included in the other costs and revenues component of the GMC revenue requirement to offset the related forecasting costs. Such fees are projected to bring in \$4.5 million in revenue in 2022.

Professional fees, which are largely outside legal and audit costs, will decrease by \$0.2 million for 2022. The decrease is primarily due to reduced need for outside legal counsel.

Training, Travel and Other Expenses

Training, travel and other costs will increase \$0.5 million to \$8.3 million for 2022. These budgets represent 4% of the 2022 and 2021 budgets.



Insurance premiums, which include all of the corporate liability and property policies, will increase \$0.5 million for 2022.

Transportation and travel along with training fees and supplies remain unchanged for 2022.

Professional dues and other costs (primarily bank fees, conference fees, office supplies and Board and stakeholder meeting costs) when combined remain unchanged for 2022.

Reconciliation of 2022 O&M Budget

The O&M budget will increase by \$9.0 million, or 4%, to \$209.8 million in 2022 compared to \$200.8 million in 2021.

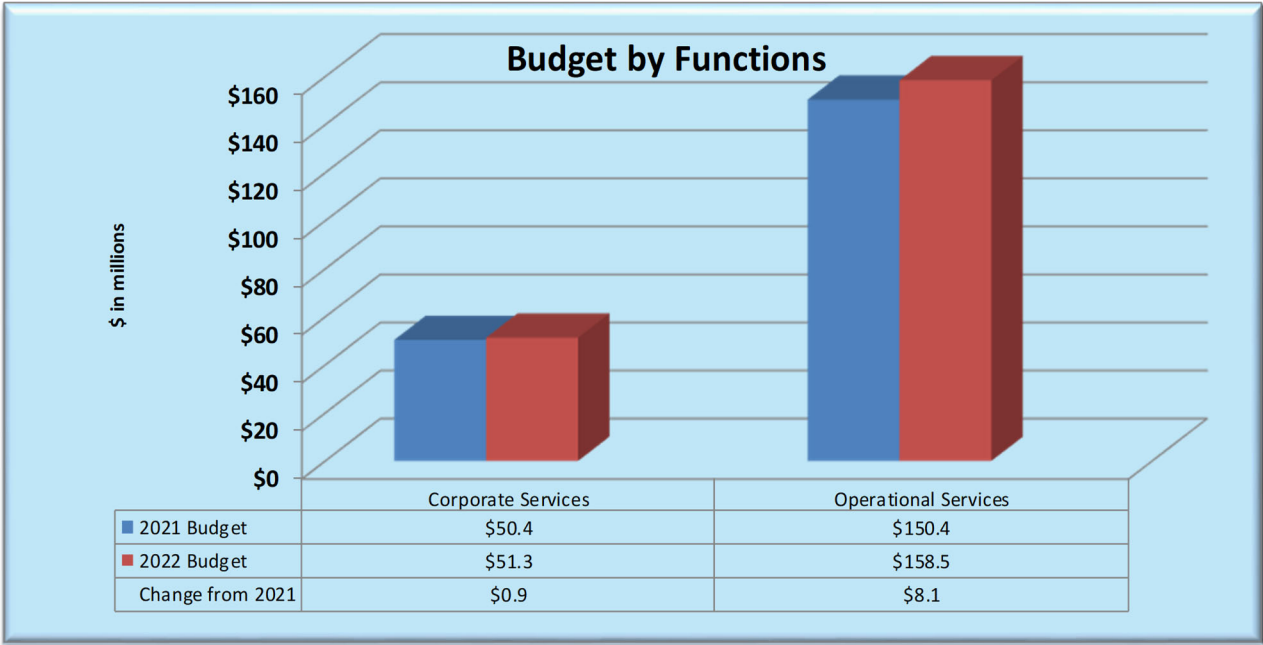
A reconciliation of the change follows (\$ in millions).

2021 O&M Budget	\$200.8
Increases in the Budget	
Merit and other compensation increases	7.9
Increase in overtime	0.1
Increase in other contracts and services	0.5
Increase in temporary staff	0.4
Increase in consultants	0.1
Increase in insurance	0.5
Total Increases	9.5
Decreases in the Budget	
Reduction in professional fees	(0.2)
Reduction in telephone & network maintenance	(0.3)
Total Decreases	(0.5)
Net Change in Budget	9.0
2022 O&M Budget	\$209.8

V. O&M Budget – Functional View

The ISO divisions represent two high-level functions in the organization – Corporate Services and Operational Services. This section will present the O&M budget broken into the functions. The 2021 budget reflects classifications in order for it to be comparable to the 2022 budget presentation.

The budget by functions is as follows.



The divisions contributing to the Operational functions account for a combined 76% of the O&M budget. Whereas the divisions contributing to the Corporate Services functions account for a combined 24% of the O&M budget. In all divisions, with the exception of the Technology related groups, the typical driver of year-over-year changes are labor related costs. While labor costs are also a main driver in the technology related groups, many of the other resource categories can have an impact on their budget as well (e.g., hardware and software maintenance costs). A detailed description of the divisions grouped by the functions follows.

Corporate Services

The divisions that contribute to the **Corporate Services** functions include the office of the Chief Executive Officer, the Finance division, the Human Resources division, the General Counsel division, the External and Customer Affairs division, and the Stakeholder Engagement and Customer Experience division.

The office of the **Chief Executive Officer** (CEO) division collaborates with the executive leadership team in developing the ISO's strategic goals and organizational priorities. The division also leads in the crafting and articulation of the ISO's mission, vision, and values, and serves as a convener and catalyst in carrying out a host of institutional initiatives. The CEO is the primary contact to the Board of Governors, Western Energy Imbalance Market Governing Body, key elected officials, stakeholders, and the general public, while also representing the ISO with a variety of regional and national energy related organizations.

The **Department of Market Monitoring** (DMM) proactively undertakes sophisticated analysis to enhance market efficiencies and mitigate market power. This effort is especially important as the ISO implements new market features and services to support renewable resource development. The department actively monitors the wholesale energy markets to prevent non-competitive behavior and ensure participants follow the rules. The DMM also reviews market results to confirm the activity produces effective and efficient outcomes. The department continues to review and provide feedback on the effectiveness of the 15-minute/5-minute markets and the Western Energy Imbalance Market (EIM). The DMM offers timely input on major market design initiatives, as well as products and requirements to ensure sufficient flexible capacity is available to integrate increasing amounts of variable renewable energy. The DMM Oversight Committee and the Board of Governors separately review and approve the DMM budget. The budget is included in the CEO division.

The **Finance** division is comprised of various financial functions including treasury, credit, accounting, financial planning and procurement. Finance professionals in the division perform typical corporate finance processes such as balance sheet optimization, credit and collateral management, clearing of the ISO market, general accounting, financial reporting, financial planning, budgeting, rate design, and procurement of goods and services for the corporation.

The **Human Resources** division uses established policies, programs and people strategies to attract and retain the uniquely talented professionals needed to reliably operate the electric grid and meet corporate strategic objectives and goals. The division also supports

efforts to create and maintain an intentional culture; cultivate technical experts and leaders; and create and implement the ISO's learning and development programs.

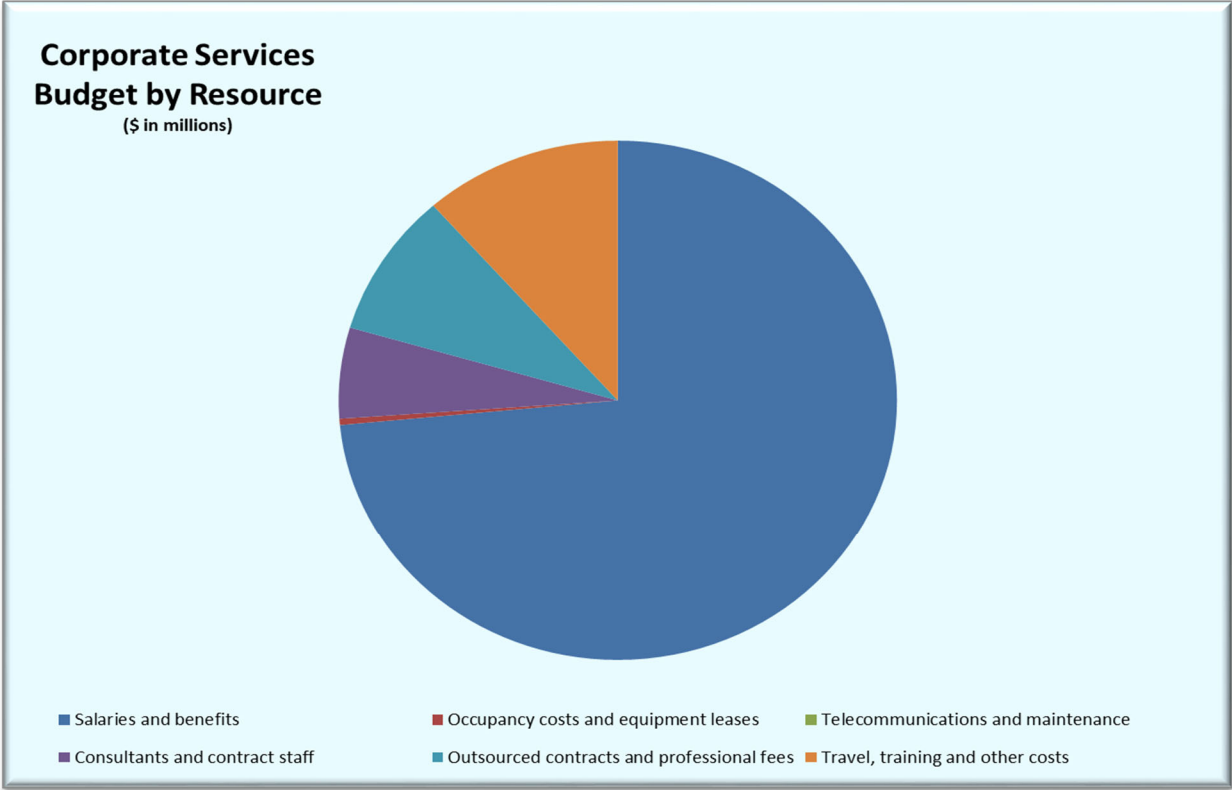
Comprised of four departments, the **General Counsel** division provides legal and regulatory advice to the Company; promotes a culture of compliance in support of all laws, regulations and corporate policies; develops the ISO's Strategic Vision; produces and implements the annual audit plan; and coordinates corporate governance matters. The General Counsel division also supports Board of Governors, Board committees, and Western Energy Imbalance Market Governing Body meetings and materials.

The **External Affairs** division is comprised of external facing business groups including state, regional, federal affairs as well as communications and public relations. It interacts with elected state officials, regional entities, regulators, and industry organizations in the West, federal lawmakers, and international delegations to enhance their understanding of grid operations and other services provided by the ISO. The division supports the EIM governance structure and committees, monitors western state and federal regulations, legislation, initiatives and activities. In doing so, it promotes the benefits of regional coordination throughout the Western Interconnection. Additionally, the communications and public relations department oversees media relations, and uses printed, digital, online, and video materials to communicate to external and internal audiences. This group maintains the ISO's internal and external websites, and develops all communication materials, to promote transparent and accessible information.

The **Stakeholder Engagement and Customer Experience** division is the primary business contact between the ISO, its customers, and industry stakeholders. The division provides customer bid-to-bill support, new participant onboarding and training and oversees the stakeholder process in the development of policy initiatives.

Summary of Budget

Labor costs represent the largest budget driver for each division. Highlights of the key non-labor budget components within the Corporate Services divisions are as follows.



The primary non-labor cost drivers in each division are:

- **CEO** division: corporate memberships, association fees, and consulting
- **Finance** division: insurance premiums, financial audit, and bank fees
- **Human Resources** division: corporate training, recruitment, and payroll services
- **General Counsel** division: outside legal and board expenses
- **External Affairs** division: corporate subscriptions, travel, and legislative and public relations support
- **Stakeholder Engagement and Customer Experience** division: stakeholder meetings and customer training

Operational Services

The divisions that contribute to the **Operational Services** functions include the office of the Chief Operating Officer division, the Infrastructure and Operations Planning division, the Power Systems Market Technology division, the System Operations division, and the Market Policy and Performance division. The functions also include the Enterprise Systems and Campus Operations department and the Program and Applications Management department.

The over-arching **Chief Operating Officer (COO)** division is a compilation of the office of the Chief Operating Officer (including the Enterprise Support and Campus Operations and Program and Application Management departments), Infrastructure and Operations Planning, Power System and Market Technology, System Operations and Market Policy and Performance divisions. The combination of these divisions and departments under the COO's leadership enables greater integration and coordination across these functions to support the ISO's efforts to meet organizational goals.

The **Infrastructure and Operations Planning** division is responsible for long term and operational grid planning activities to support the growth in renewable resources and maintaining and strengthening grid reliability. These activities include conducting the annual assessment of summer conditions. The division leads the generation interconnection application and contracting process, performs studies for resources seeking to interconnect to the grid, and manages all regulated contracts on behalf of the organization. The division promotes timely and efficient infrastructure development and service-focused maintenance program oversight. It is responsible for complying with NERC standards and WECC regional criteria for the planning coordinator functional entity and the operational planning requirements for the Reliability Coordinator functional entity.

The **Power System and Market Technology** division consists of the Power System Technology Development, Power System Technology Operations, and IT Infrastructure, Architecture and Information Security departments. The Power System Technology Development department develops and implements market and reliability software applications to manage and operate the high-voltage electricity grid and wholesale energy market. The Power System Technology Operations department provides technology support for reliability systems, market systems, enterprise model management system, interchange scheduling and tagging systems, and forecasting systems. This group also provides monitoring and first level support to all of the ISO's bid-to-bill critical systems. The IT Infrastructure, Architecture and Information Security department protects the ISO's

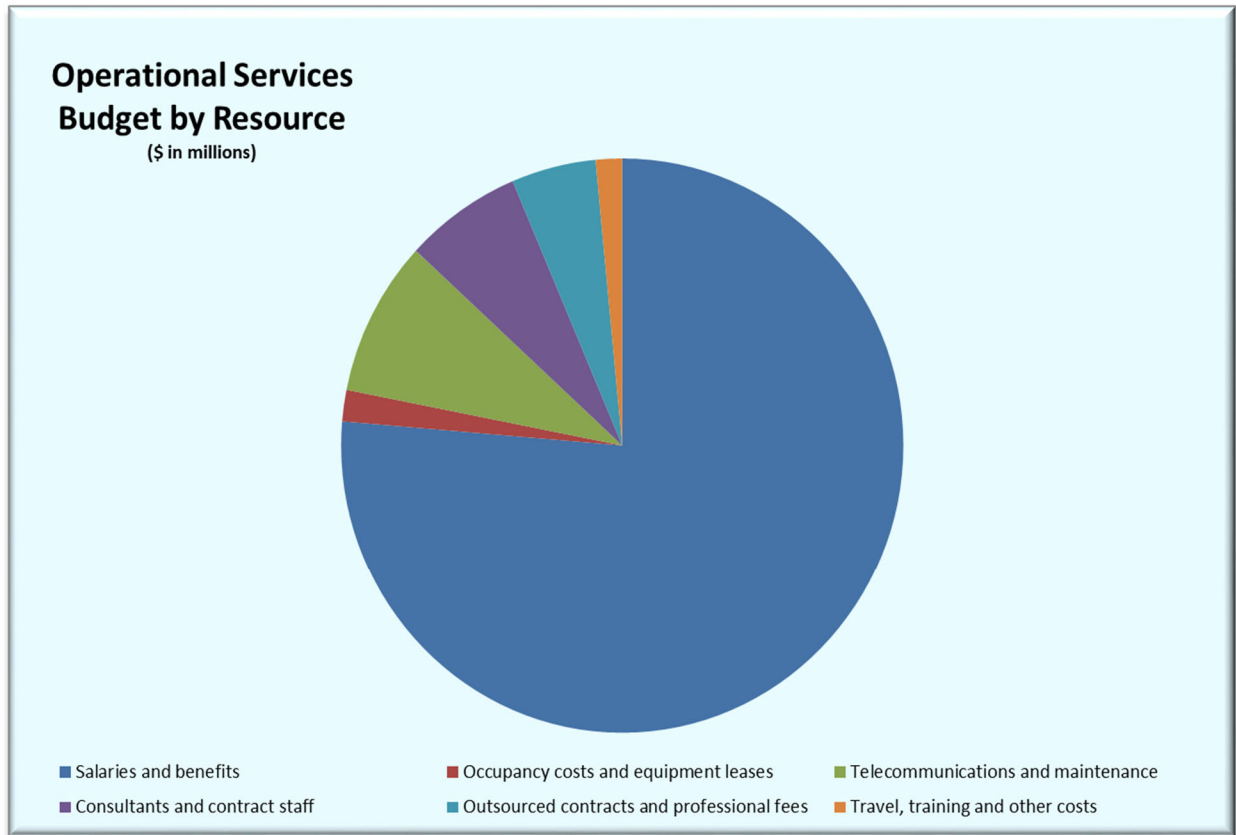
physical and cyber assets, designs new and emerging technology architecture guidelines for IT, engineers new integration technical solutions following architecture roadmap, manages IT infrastructure hardware, software, database, storage, and IT network and communications.

The **System Operations** division prepares for and manages the reliable operation of the high voltage electric system as well as managing after-the-fact settlement. The Operational Readiness department prepares for the reliable operation by coordinating the integration of all new resources and transmission facilities into the network model used by the System Operators as well as providing training to them. The System Operators oversee the day-to-day operations of the grid in compliance with federal and regional reliability standards; prevent or mitigate system emergencies in the day-ahead or real-time operations; and coordinate with adjacent reliability coordinators. After the operating date, the Operations Services, Compliance and Analysis department produces daily settlement statements; provides data validations; resolves settlements; performs reporting price corrections; and provides compliance analysis.

The **Market Policy and Performance** division is composed of three departments: Market and Infrastructure Policy, Market Analysis and Forecasting, and California Regulatory Affairs. The division is responsible for developing market and infrastructure policy; tracking and reporting on market performance; pricing analysis and validation; validation of market inputs and market enhancements; short-term load, wind, and solar forecasting; evaluating the benefits of the Western EIM; commitment costs and cost adder calculation and adders; and managing relationships with and participating in regulatory matters with the California Public Utilities Commission, the California Energy Commission, and the California Air Resources Board.

Summary of Budget

Labor costs represent the largest budget driver for each division. Highlights of the key non-labor budget components within the Operational Services divisions are as follows.



The primary non-labor cost drivers in each division are:

- **COO** division: program management support, facility operating and maintenance expense, and campus security
- **Infrastructure and Operations Planning** division: transmission planning and contracts support
- **Power Systems and Market Technology** division: hardware, software, and application maintenance support, telecommunication expense, and forecasting data subscriptions
- **System Operations** division: operations training programs and energy system data support
- **Market Policy and Performance** division: market surveillance committee expense, policy and meteorological support, and energy data subscriptions

VI. Debt Service

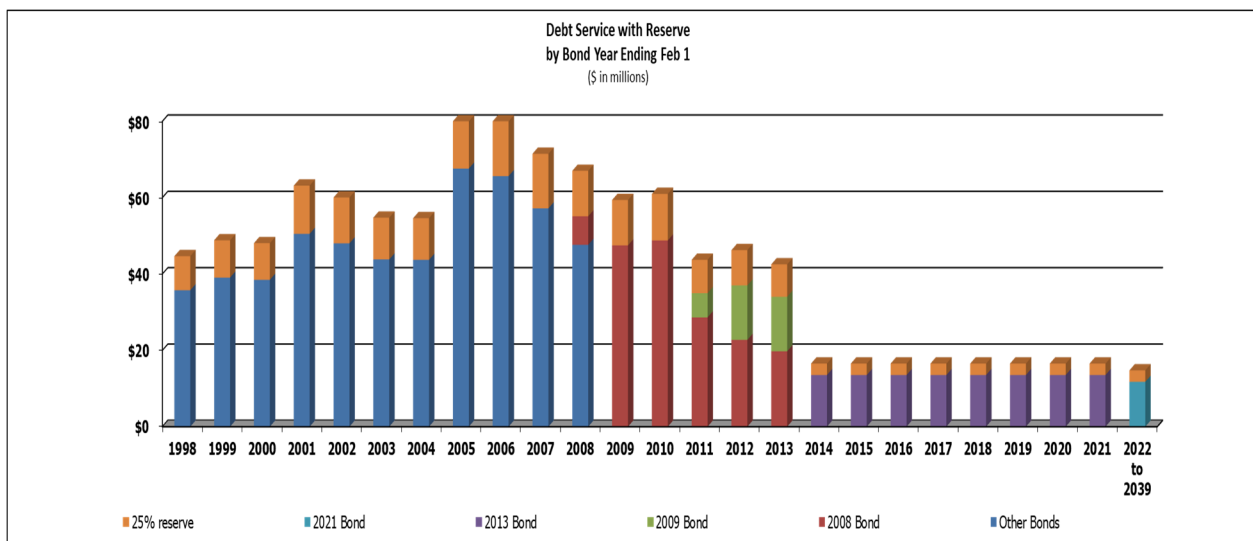
The debt service amount included in the 2022 GMC revenue requirement is \$14.7 million, which is a \$2.2 million reduction from 2021. The amount includes the principal and interest payments due on the Series 2021 bonds and the 25% debt service reserve. The total equals the sum of the semi-annual interest payment due in August of the budget year, the principal and semi-annual interest payment due in February of the ensuing year, and the 25% debt service reserve amount required by the tariff and bond documents.

A summary of the debt service components is as follows.

Debt Service (\$ in millions)	2022 Budget	2021 Budget	Change
Principal payments	\$8.7	\$5.6	\$3.1
Interest payments	3.0	7.9	(4.9)
Subtotal	11.7	13.5	(1.8)
25% debt service reserve	3.0	3.4	(0.4)
Total Debt Service	\$14.7	\$16.9	(\$2.2)

The Series 2021 bonds were issued in January 2021 to refinance the 2013 bonds. The refinancing of the 2013 bonds will save the ISO approximately \$30 million in principal and interest over the life of the bonds. The 2013 bonds were issued to finance the ISO's headquarters facility in Folsom, California and to fund other capital expenditures. Below is the future amortization schedule for the 2021 bonds. Note: The bonds are callable on February 1, 2031.

The graph below provides a summary of the historical and future debt service.



VII. Capital / Project Budget and Cash-Funded Capital

The cash-funded capital component of the 2022 GMC revenue requirement is \$30 million. This component has been critical to the ISO's goal of maintaining a stable GMC revenue requirement. Historically, capital projects had largely been funded by debt financing. Beginning in 2010, the ISO converted debt service savings in the GMC revenue requirement to the cash-funded capital component. Using these collections as a way to finance capital projects removed the inefficiencies and costs associated with debt financing.

From the 2022 cash-funded capital component, the ISO is proposing a capital / project budget of \$18 million to \$20 million to fund projects such as those detailed on the following pages. The Board of Governors approval of the 2022 GMC revenue requirement will include this capital/project budget; the budget will be managed separately from the GMC revenue requirement.

The Corporate Management Committee (CMC) authorizes individual projects within the approved budget throughout the year. The CMC includes the Chief Executive Officer, VP - Chief Financial Officer and Treasurer, and VP - General Counsel and Chief Compliance Officer. The Board of Governors must approve any increases above the current year's approved budget.

Future annual capital / project budgets are estimated to be approximately \$20 million per year and are funded through the cash-funded capital component of the GMC revenue requirement and its related reserves. Excess amounts in any given year are set aside for future projects, which enables the ISO to maintain a stable revenue requirement for an extended period.

Supplemental Projects

Several entities have signed EIM agreements for planned implementations in 2022 and 2023. The entities with planned implementations in 2022 include Avista, Bonneville Power Administration, Tacoma Power, and Tucson Electric Power. The entities with planned implementation in 2023 include Avangrid, El Paso Electric, Public Service of Colorado, and WAPA Desert Southwest Region. As outlined in the agreements, the EIM entities must reimburse the ISO for costs incurred for their implementation. As the entities provide

funding for their implementations, these implementation projects are not included in the annual capital / project budget.

Capital / Project Budget Development Process

The 2022 project prioritization process runs from July 2021 through November 2021. The Enterprise Program Management Office collaborates with the internal business units to update a list of projects throughout the year. The list aligns with the corporate vision, the information technology roadmap, and the market initiatives roadmap. On a periodic basis, strategic initiative owners and managers review the progress of active projects, identify issues and risks, and propose changes to the master project list.

The project list is updated as part of the annual budgeting process to align the strategic projects scheduled for the following year. The projects are ranked to help determine the most important items, which results in an initial master list. The rating of each project is based on the criteria listed below. The ISO website contains additional project and release information².

Ranking Criteria		
Strategy	Strategic Initiative	Weight
Compliance	Establish a culture of compliance	15%
Grid reliability	Enhances reliability of the grid by addressing and existing or potential operational issue	15%
Contributes to increased customer service		10%
Ensure continued reliability during grid transformation (capacity on the system)	Evolve the market	10%
	Markets and performance (MAP)	
	Develop infrastructure and tools	
Explore opportunities for regional collaboration and technological innovation	Incorporate renewable resources	10%
	Improve forecasting capabilities	
	MAP	

² The latest ISO release planning and project information is available on the ISO website at <http://www.caiso.com/informed/Pages/ReleasePlanning/Default.aspx>

Ranking Criteria		
Strategy	Strategic Initiative	Weight
ISO process improvement	Process and quality	10%
Market efficiency	Addresses a current or potential market inefficiency	10%
Strengthen California’s global leadership commitment to renewable, responsible and reliable energy (regulatory coordination)	Advance state energy and environmental initiatives	10%
Development of staff / talent pipeline	People strategies	5%
Information Technology system qualities	System and tools	5%
Total Ranking Weight		100%

The business and financial case criteria follows:

- Does the project require development by market participants?
- Does the project deliver cost savings?
- How much are the project implementation costs?
- Does the project reduce operations and maintenance costs?
- Does the project mitigate any corporate risk?
- A factor for executive discretion is included.

Proposed Project List

The following list provides an indication of the final projects proposed for initiation during 2022 within the \$18 million to \$20 million project budget.

This year’s list includes the following four areas and initiatives:

- Market and operational excellence,
- Enhancement of the technology foundation,
- Focus on customer service and other costs, and
- Grid evolution readiness and regional innovation opportunities.

All projects that are ready for funding are presented to the CMC for consideration and approval. Items that the CMC consider include business case and cost-benefit to the company and market participants. The CMC approves and monitors projects on a monthly basis.

The 2022 priorities may change depending on developments during the remainder of 2021 and into 2022. The actual projects completed during 2022 will vary, including the potential addition of projects currently not on the following list, the deferral of projects on this list to future years, or the elimination of projects deemed to be unnecessary.

Project costs are categorized as follows: small projects are under \$500,000, medium projects are from \$500,000 up to \$1 million, and large projects are over \$1 million.

Proposed Projects for 2022	Amount
Market and Operational Excellence	
Energy management system (EMS) enhancements ,infrastructure and software upgrades	Large
Extended day ahead market	Large
Operations & market services system improvements 2022	Large
Day ahead market (DAM) enhancements	Medium
End of life technology & vulnerability remediation	Medium
Expanded operations training center	Medium
Forecast improvements and automation	Medium
Pump storage with multiple pumping levels	Medium
FERC NOPR - managing transmission line ratings	Medium
Enterprise model management system (EMMS) phase 4	Medium
Existing transmission contract calculator (ETCC) path limit calculator enhancements	Medium
Renewable and load forecasts enhancements	Medium
Resource adequacy enhancements phase 2	Medium
Optimal multi-stage generation (MSG) transitioning profile	Medium
Market quality system (MQS) redesign	Medium
Operations training environment improvements	Small
Incorporation of operations non-core tools into final destination	Small
Multi-stage generation (MSG) grouping constraints	Small
Reliability coordinator dynamic stability analysis (DSA) enhancements	Small
Reliability coordinator enhancements phase 2	Small
Advanced curtailment tool	Small

Proposed Projects for 2022	Amount
Maximum Import Capability (MIC) enhancements 2022	Small
WebSDK user interface improvements	Small
Voltage stability analysis (VSA) enhancements 2022	Small
Operations transparency by use of IT system management tool (ITSM)	Small
CAISO energy transfer system resources (ETSR) improvements	Small
Energy storage enhancements - expedited components	Small
Pump storage - MPL POC	Small
Market analysis enhancements 2022	Small
EIM base schedule submission deadline phase 1 (startup energy)	Small
Transmission access charge (TAC) structure enhancements	Small
Resource sufficiency evaluation redesign	Small
FERC 2222 - distributed energy resources	Small
Generator contingency and remedial action model (GCARM) remedial action schemes (RAS) enhancements	Small
Day ahead reliability tool phase 2	Small
Imbalance conformance enhancements – user interface (UI)	Small
Constraint parameter enhancement	Small
Replace vision tool with quality training database (QTD)	Small
External plant information (PI) displays	Small
Total Market and Operational Excellence	\$20,850,000
Enhance the Technology Foundation	
Miscellaneous hardware & software purchases	Large
Market & grid integrated information (MAGII) with analytics data base -	Large
Program office internal labor	Medium
Technology systems improvements for production 2021	Medium
Real time application improvements	Medium
Customer ISO resource adequacy (CIRA)-technical enhancements	Medium
Model synchronization and activation (MSAA) Phase 2	Medium
Topology state estimator phase 2	Medium
Masterfile service oriented architecture (SOA) phase 3	Medium
Transmission register (TR) replacement phase 1	Medium
Price performance enhancements	Medium
Energy cost and indices calculator (ECIC)- Phase 2b	Medium
Market software performance and robustness 2022	Small
Web service standardization	Small

Proposed Projects for 2022	Amount
Compliance automation backlog (CENTRIC)	Small
Logging replacement	Small
Ancillary services (AS) procurement from variable energy resources (VER)	Small
Data persistence market software	Small
Initialization funding for capital projects	Small
Salesforce upgrades & stabilization	Small
FERC 831 - energy storage/demand response (DR) bids above the cap	Small
Project server 2019 upgrade	Small
Vendor portal for accounting	Small
Total Enhance the Technology Foundation	\$15,418,200
Focus on Customer Service and Other Costs	
Facilities replacement reserve	Large
Campus operations annual funding	Small
BA Customer Enhancements 2022	Small
Customer service improvement projects	Small
Business Process Framework Program	Small
Access and identity management (AIM) Enhancements	Small
Making meeting matter	Small
Centralized customer contacts	Small
Total Focus on Customer Service and Other Costs	\$2,320,000
Grid Evolution Readiness and Regional Innovation Opportunities	
Resource interconnection management system (RIMS) and Interconnection process improvements 2022	Medium
Nodal Pricing Model Plus	Medium
External Load Forward Scheduling Rights Process	Small
Energy imbalance market (EIM) enhancements 2022	Small
RC Portal Enhancements	Small
Total Grid Evolution Readiness and Regional Innovation Opportunities	\$2,200,000
Total Proposed Projects for 2022	\$40,788,200

VIII. Other Costs and Revenue

Other costs and revenue will increase by \$2.7 million to \$53.2 million primarily due to additional revenues from the entities joining EIM in 2022. This component, representing net revenues received outside of the GMC, lowers the overall GMC revenue requirement. By diversifying its revenue streams, the ISO is able to maintain a favorable revenue requirement (and ultimately favorable rates) while still developing well-rounded O&M and capital budgets that serves its needs.

The details of this category are as follows.

Other Costs and Revenue (\$ in millions)	2022 Budget	2021 Budget	Change
Reliability Coordinator Funding Requirement	\$18.0	\$18.0	\$0.0
Energy Imbalance Market Administrative Charges	14.1	11.4	2.7
Nodal Pricing Model Fee	8.4	8.4	-
Intermittent Resource (wind and solar) Forecasting Fees	4.5	4.5	-
Interest Earnings	3.8	4.2	(0.4)
Generation Interconnection Project Fees	2.0	1.6	0.4
HANA Administrative Fees	0.9	0.9	-
Scheduling Coordinator Application and Other Fees	0.8	0.8	-
California-Oregon Intertie Path Operator Fees	0.7	0.7	-
Total Other Costs and Revenue	\$53.2	\$50.5	\$2.7

The 2022 RC funding requirement, calculated at \$18 million, represents the amount of revenue the ISO requires to offset the costs it will incur to provide RC services. The RC funding requirement is calculated as a percentage, known as the RC funding percentage, of the revenue requirement. The RC funding percentage is one of the cost category percentages analyzed in the triennial cost of service study. The results of the 2019 cost of service study indicated no change to the RC funding percentage was necessary; the funding percentage remains unchanged at 9%.

The 2022 RC funding requirement as a component of the total revenue requirement is shown below.

Revenue Requirement (\$ in millions)	RC %	2022 Budget
Operations and Maintenance Budget		\$ 209.8
Debt Service (including 25% reserve)		14.7
Cash Funded Capital		30.0
Other Costs and Revenues		(35.2)
Operating Cost Reserve Adjustment		(19.2)
Revenue Requirement (prior to RC Funding Requirement)		200.1
RC Funding Requirement for January - December 2022	9%	(18.0)
Total Revenue Requirement		\$ 182.1

EIM administrative charges are projected to increase to \$14.1 million in 2022 due to increased participation in the market. The Western EIM currently has fifteen participating members in eight western states and produced over \$1.4 billion dollars in gross benefits since its launch in November 2014. New participants scheduled for 2022 include Avista, Bonneville Power Administration, Tacoma Power, and Tucson Electric Power.

Interest earnings are projected to decrease to \$3.8 million due to an anticipated rising interest rate environment in 2022, which could lead to lower overall returns for the year.

Fees for conducting generator interconnection project studies are expected to increase to \$2 million to reflect increase in project requests.

All other components of this category are projected to remain unchanged.

IX. Operating Cost Reserve Adjustment

The operating cost reserve adjustment for 2022 will be a \$19.2 million credit. This amount will reduce the GMC revenue requirement. This component typically includes the following adjustments:

- An adjustment related to a change in O&M budget to ensure that the 15% reserve margin is maintained per the tariff.
- The return of the 25% debt service reserve collection from the prior year.
- The true-up of budget-to-actual revenues and expenses from the preceding audited year.³

A summary of the adjustment is below.

Operating Cost Reserve Adjustment (\$ in millions)	2022 Budget	2021 Budget	Change
Change in the 15% reserve for O&M budget	(\$1.4)	(\$0.9)	(\$0.5)
25% debt service collection from prior year	3.4	3.4	(0.0)
True-up of budget to actual revenues and expenses	17.2	11.1	6.1
Total Operating Cost Reserve Credit / (Debit)	\$19.2	\$13.6	\$5.6

The calculation of the 15% reserve adjustment is below.

Change in 15% Operating Reserve (\$ in millions)	2022 Budget	2021 Budget	Change
O&M budget	\$209.8	\$200.8	\$9.0
Operating Reserve percentage	15%		
Total Operating Reserve	\$31.5	\$30.1	\$1.4

³ See Attachment A, Calculation of Operating Cost Reserve Adjustment, for detailed calculation information.

X. Grid Management Charge and Other Calculations

The ISO recovers its GMC revenue requirement through unbundled grid management charges (GMC). Each unbundled service has a corresponding rate, which is paid by service users. Rates are calculated by dividing each service cost by its forecasted billing determinant volume. The result is a rate per unit of use. The current design, implemented in 2012, provides for three volumetric charges and five associated fees and charges. The cost categories consist of market services, system operations, and congestion revenue rights (CRR). The design was updated in 2015, 2018, and 2021 as a result of cost of service studies.

The ISO completed its most recent cost of service study in 2020; the study used activity based costing to analyze cost and time data from 2019. The new percentage allocations and fee changes as a result of the study became effective January 1, 2021 and will remain in effect through the development of the 2023 GMC revenue requirement and resulting charges.

Components of GMC and Billing Determinants

The three service categories, five associated fees and charges, and their billing determinants are as follows:

Type	Bill Determinant	Charge Code
Grid Management Charges		
Market Service Charge	Awards in MWh or MW of supply and demand excluding Transmission Ownership Rights (TORs)	4560
Systems Operations Charge	Metered flows in MWh of supply and demand in the ISO balancing authority with the following two exceptions, TORs and qualifying grandfathered supply contracts	4561
CRR Service Charge	MWh of congestion	4562
Miscellaneous Fixed Fees		
Bid Segment Fee	Number of bid segments in the ISO market for supply or demand	4515
Inter-SC Trades Fee	Number of trades by scheduling coordinator (SC)	4512
SCID Fee	Monthly charge if statement produced for an SC	4575
TOR Charge	Minimum of metered supply or demand in MWh on TORs	4563
CRR Auction Bid Fee	Number of accepted bids in CRR auctions	4516

Rate Calculation

There are eight steps to calculate rates, as noted below:

1. Estimate billing determinant volumes for fees and charges;
2. Multiply volumes by rates to derive revenues for individual fees and charges;
3. Allocate over or under collection of GMC revenue to the three service categories;
4. Allocate remaining GMC revenue requirement into three service categories;
5. Deduct fee and charge revenue from associated service category costs;
6. Estimate billing determinant volumes for three service categories;
7. Deduct grandfathered supply volumes from system operations charge; and
8. Divide residual GMC revenue requirement from step 4 by adjusted billing determinant volumes from steps 6 and 7 to derive individual service category rates⁴.

⁴ See Attachment B, Actual and Estimated Volumes, for detailed information.

Calculation of Service Category Rates

Component	Market Services	System Operations	CRR Services	Total
Allocation of Revenue Requirement (\$ in thousands)				
Total Revenue Requirement				\$182,086
Adjust for (over) / under collection of 2020 rates	(\$1,323)	(\$2,649)	(\$374)	(4,346)
Remaining to allocate				186,432
Percentages	49%	49%	2%	100%
% allocation of costs	91,352	91,352	3,728	186,432
Combined costs	90,029	88,703	3,354	182,086
Deduct Fee Revenue				
Bid Segment Fees	416	-	-	416
Inter-SC Trade Fees	2,647	-	-	2,647
SCID Fees	7,965	-	-	7,965
TOR Fees	-	520	-	520
CRR Auction Bid Fees	-	-	1,033	1,033
Total Fees	11,028	520	1,033	12,581
Calculation of Recoverable Costs				
Costs Less Fees	\$79,001	\$88,183	\$2,321	\$169,505
Projected MWh Volumes				
MWh Volumes	535,400,363	441,865,875	418,177,317	
Less grandfathered supply	-	0	-	
Adjusted MWh Volumes	535,400,363	441,865,875	418,177,317	
Resulting Rates / MWh	\$0.1476	\$0.1996	\$0.0056	

Calculation of Fee Revenue

Fee	Rate	Estimated Volumes	Estimated Revenue (\$ in thousands)
Bid Segment Fees	\$0.0050	83,101,786	\$416
Inter-SC Trade	1.00	2,647,259	2,647
SCID Fees	1,500	443	7,965
TOR Fees	0.1800	2,887,595	520
CRR Auction Bid	1.00	1,032,895	1,033
Total			\$12,581

Summary of Rates

Comparison of GMC Revenue Requirements by Service Category

(\$ in millions)

Charge Code	Service Category or Fee	2022 Budget	2021 Budget	\$ Variance
4560	Market Service Charge	\$79.0	\$79.0	\$0.0
4561	Systems Operations	88.2	88.9	(0.7)
4562	CRR Services Charge	2.3	2.1	0.2
4515	Bid Segment Fees	0.4	0.5	(0.1)
4512	Inter-SC Trades Fees	2.7	2.6	0.1
4575	SCID Fees	8.0	6.7	1.3
4563	TOR Charges	0.5	0.7	(0.2)
4516	CRR Auction Bid Fees	1.0	1.1	(0.1)
Total		\$182.1	\$181.6	\$0.5

Comparison of Grid Management Charge Rates

(\$ per unit)

Charge Code	Service Category	2022 Rate	2021 Rate	\$ Variance	Comments
4560	Market Service Charge	\$0.1476	\$0.1485	(\$0.0009)	Rate decreased compared to the 2021 rate primarily due to higher projected volumes.
4561	Systems Operations Charge	\$0.1996	\$0.2043	(\$0.0047)	Rate decreased compared to the 2021 rate due to the lower amount of GMC Revenue Requirement to collect for the System Operations cost category and higher projected volumes.
4562	CRR Services Charge	\$0.0056	\$0.0048	\$0.0008	Rate increased compared to the 2021 rate due to the higher amount of GMC Revenue Requirement to collect for the CRR Services cost category offset slightly by higher projected volumes.

Comparison of EIM Administrative Rates

(\$ per unit)

Grid Management Charge	EIM Portion	2022		2021		\$ Variance
		% of GMC Service Charge	EIM Administrative Rates	% of GMC Service Charge	EIM Administrative Rates	
Market Services	Real Time Market	63%	\$ 0.0930	63%	\$ 0.0936	\$ (0.0006)
System Operations	Real Time Dispatch	50%	\$ 0.0998	50%	\$ 0.1022	\$ (0.0024)

Reliability Coordinator Service Rates

(\$ per unit)

Reliability Coordinator Service Rate	
RC Funding Requirement (\$ in millions)	\$ 18.0
Projected Volumes in TWh	639.8
Projected RC Service Rate per MWh	\$ 0.0281

Summary of Charges, Fees, and Supplemental Rates

(\$ per unit)

Charge Code	Summary of Charges, Fees, and Rates	2022 Rate	2021 Rate	Change \$	Billing Unit
Grid Management Charges					
4560	Market Service Charge	\$0.1476	\$0.1485	(\$0.0009)	per MWh
4561	Systems Operations Charge	\$0.1996	\$0.2043	(\$0.0047)	per MWh
4562	CRR Services Charge	\$0.0056	\$0.0048	\$0.0008	per MWh
Miscellaneous Fixed Fees					
701	EIR Forecast Fee	\$0.1000	\$0.1000	\$0.0000	per MWh
4512	Inter-SC Trade Fees	\$1.00	\$1.00	\$0	per # of trades
4515	Bid Segment Fees	\$0.0050	\$0.0050	\$0.0000	per # of bid segments
4516	CRR Auction Bid Fees	\$1.00	\$1.00	\$0.0000	per # of nominations and bids
4563	TOR Fees	\$0.1800	\$0.1800	\$0.0000	per MWh
4575	SCID Fees (monthly)	\$1,500	\$1,500	\$0	per # of SCID
Supplemental Services Rates					
4564	EIM Market Service	\$0.0930	\$0.0936	(\$0.0006)	per MWh
4564	EIM System Operations	\$0.0998	\$0.1022	(\$0.0024)	per MWh
5701	RC Service Rate	\$0.0281	\$0.0278	\$0.0003	per MWh

Calculation of Operating Cost Reserve Adjustment

(\$ in millions)

There are four factors that affect the calculation of the reserve adjustment:

- Prior year's 25% debt service reserve
- 2020 true-up
- 2021 estimates
- Change in the 15% operating cost reserve

Summary of Operating Cost Reserve Adjustment	If no changes to last years plan (a)	Budget to Actual (b)	Difference
Prior year's 25% debt service reserve collected	\$ 3,381	\$ 3,381	\$ -
2020 true-up	-	17,196	17,196
2021 estimates	-	-	-
Change in the 15% operating cost reserve	(1,350)	(1,350)	-
2022 Reserve credit / (debit) from 2020 operations	\$ 2,031	\$ 19,227	\$ 17,196
(a) Plan assumes prior year expenses and revenues were equal to budgeted amounts.			
(b) Revised reflects the true -up of prior year activities.			

Calculation of Operating Cost Reserve Adjustment

(\$ in millions)

2020 True Up			
Description	Budget	Actual	Difference
<u>Revenue</u>			
GMC revenue	\$ 186,943	\$ 191,749	\$ 4,806
Other income	41,245	44,707	3,462
Realized gain on investments	-	2,411	2,411
Total revenue	228,188	238,866	10,678
<u>Expenses</u>			
Expenses	(194,951)	(185,292)	9,659
Debt service: principal	(5,395)	(5,395)	-
Debt service: interest	(8,128)	(8,147)	(19)
Debt service: reserve	(3,381)	(3,381)	-
Cash funded capital	(28,000)	(28,000)	-
Capital funded by EIM fees adjustment	-	(2,340)	(2,340)
Self-funded healthcare adjustment	-	(2,178)	(2,178)
2021 Debt service over-collection	-	1,395	1,395
Total expenses	(239,855)	(233,337)	6,518
<u>Impact to Operating Reserve</u>			
Net change in prior year true-up	\$ (11,667)	\$ 5,529	\$ 17,196

Calculation of Operating Cost Reserve Adjustment

(\$ in millions)

2021 Estimates			
Description	Budget	Estimate	Difference
<u>Revenue</u>			
GMC revenue	\$ 181,680	\$ 181,680	\$ -
Other income	50,457	50,457	-
Total revenue	232,137	232,137	-
<u>Expenses</u>			
Operations and maintenance	(200,810)	(200,810)	-
Debt service: principal	(5,395)	(5,395)	-
Debt service: interest	(8,128)	(8,128)	-
Debt service: reserve	(3,381)	(3,381)	-
Cash funded capital	(28,000)	(28,000)	-
Total expenses	(245,714)	(245,714)	-
<u>Impact to Operating Reserve</u>			
Net change current year estimates	\$ (13,576)	\$ (13,576)	\$ -

Change in 15% Operating Cost Reserve			
Description	2021 Budget	2022 Budget	Change
Change in operations and maintenance budget from prior year	\$ 200,810	\$ 209,809	\$ 8,999
Change in the 15% operating cost reserve	\$ 30,121	\$ 31,471	\$ 1,350



California ISO

Actual and Estimated Volumes

Attachment B

Note: Actual data may vary between reporting cycles due to recalculation of settlement statements.

Charge Type:	Market Services	System Operations	CRR Services	Inter-SC Trades	Bid Segment Fees	CRR Auction Bid Fees	TOR Fees	SCID Fees
Charge Code:	4560	4561	4562	4512	4515	4516	4563	4575
Unit:	MWh & MW	MWh	MWh	# of trades	# of bid segments	# of nominations & bids	Minimum of TOR supply & demand	# of SCID's

2018 Actual Units								
Jan-18	40,581,592	35,192,541	72,836,487	167,642	5,198,750	62,160	297,144	305
Feb-18	37,830,207	31,764,777	65,488,442	160,956	4,732,582	60,184	242,274	305
Mar-18	41,075,082	34,080,015	66,888,589	174,284	5,325,110	60,474	346,503	306
Apr-18	39,788,145	32,922,961	62,889,737	180,400	5,380,146	51,408	373,257	319
May-18	43,252,938	35,822,906	65,177,511	183,256	5,829,922	54,667	476,912	324
Jun-18	46,113,917	38,477,306	63,726,392	197,328	6,018,982	64,826	479,127	328
Jul-18	58,033,966	48,359,845	70,844,513	224,344	6,601,730	70,021	485,326	334
Aug-18	55,628,359	47,219,514	71,015,782	239,172	7,025,780	70,173	470,235	334
Sep-18	46,514,497	39,259,889	67,344,750	231,184	6,618,150	70,794	477,184	335
Oct-18	44,179,301	36,183,360	69,093,395	206,436	6,468,862	82,796	386,458	335
Nov-18	42,433,053	35,404,785	68,835,029	192,364	6,198,378	83,752	369,025	338
Dec-18	44,263,464	37,000,915	71,712,289	199,664	6,525,552	242,686	353,231	337
Total	539,694,522	451,688,814	815,852,916	2,357,030	71,923,944	973,941	4,756,675	3,900

2019 Actual Units								
Jan-19	41,815,480	34,655,055	30,711,450	199,888	6,631,928	48,219	392,081	333
Feb-19	39,653,349	32,824,285	28,479,230	182,352	5,904,408	45,923	280,273	340
Mar-19	41,464,915	34,246,402	32,135,302	215,758	6,364,278	48,944	319,007	336
Apr-19	41,038,111	33,537,971	30,801,634	218,624	6,336,702	49,792	391,675	341
May-19	42,656,660	34,572,893	32,270,261	238,124	6,739,848	49,674	375,021	341
Jun-19	44,829,460	37,986,834	34,142,961	247,422	6,823,450	61,827	425,206	347
Jul-19	51,704,118	43,890,820	34,755,542	266,350	7,264,290	65,050	449,136	347
Aug-19	52,126,205	45,428,668	35,838,863	266,286	7,301,898	64,480	442,601	347
Sep-19	48,703,414	40,939,510	35,267,279	245,008	7,449,976	63,156	402,080	352
Oct-19	43,277,367	35,280,487	35,282,066	231,452	7,538,132	76,363	315,697	353
Nov-19	39,898,532	33,323,945	34,562,683	209,116	7,050,626	113,734	208,144	354
Dec-19	42,031,831	35,851,485	35,274,639	219,260	7,317,016	250,670	312,996	351
Total	529,199,442	442,538,356	399,521,910	2,739,640	82,722,552	937,832	4,313,917	4,142



Actual and Estimated Volumes

Note: Actual data may vary between reporting cycles due to recalculation of settlement statements.

Charge Type:	Market Services	System Operations	CRR Services	Inter-SC Trades	Bid Segment Fees	CRR Auction Bid Fees	TOR Fees	SCID Fees
Charge Code:	4560	4561	4562	4512	4515	4516	4563	4575
Unit:	MWh & MW	MWh	MWh	# of trades	# of bid segments	# of nominations & bids	Minimum of TOR supply & demand	# of SCID's

2020 Actual Units								
Jan-20	40,933,378	34,402,326	34,139,627	203,592	7,127,726	57,321	262,412	347
Feb-20	38,685,078	31,809,518	33,113,372	195,080	6,681,572	59,891	235,599	347
Mar-20	40,113,370	32,594,076	37,559,372	212,542	6,949,844	66,811	304,062	345
Apr-20	37,940,957	30,524,197	36,615,491	223,346	7,079,984	71,004	344,993	351
May-20	42,271,518	35,117,665	37,206,301	230,566	7,597,150	77,359	429,483	357
Jun-20	45,361,026	37,715,544	41,018,642	231,626	7,850,368	82,039	462,135	359
Jul-20	51,758,418	43,528,995	40,238,159	247,282	8,171,918	77,179	447,785	357
Aug-20	55,638,144	47,332,284	39,573,606	247,266	7,316,208	75,999	402,614	366
Sep-20	50,029,391	41,228,529	38,026,171	231,544	6,780,340	77,539	373,728	370
Oct-20	45,384,149	37,674,306	35,299,599	222,458	6,790,348	94,395	326,938	371
Nov-20	39,607,135	32,802,326	34,666,938	205,740	6,129,128	130,494	294,850	374
Dec-20	42,442,621	34,902,139	36,999,923	216,882	6,469,474	268,252	300,208	372
Total	530,165,183	439,631,905	444,457,201	2,667,924	84,944,060	1,138,283	4,184,806	4,316

2021 Actual Units from January to August & Estimate from September to December.								
Jan-21	40,630,367	33,275,188	32,434,554	195,948	6,337,954	49,543	265,133	366
Feb-21	37,656,582	30,228,071	31,185,981	176,966	5,726,748	53,265	161,593	375
Mar-21	41,362,779	33,374,714	34,856,656	205,174	6,451,154	57,982	292,168	378
Apr-21	40,390,040	32,445,292	30,298,140	210,594	6,767,498	62,480	273,964	384
May-21	44,255,970	35,616,728	33,098,452	222,608	7,129,804	64,850	312,933	393
Jun-21	50,272,706	40,639,910	35,383,485	231,136	7,359,174	79,020	336,064	401
Jul-21	56,906,662	47,047,824	40,250,313	256,576	8,270,814	83,260	330,038	420
Aug-21	55,219,545	45,576,455	38,735,216	255,544	8,473,857	75,999	277,678	420
Sep-21	51,192,326	41,297,159	35,072,906	240,719	6,506,286	71,547	295,884	401
Oct-21	46,434,794	37,578,455	32,558,091	224,600	6,515,889	87,100	260,453	403
Nov-21	38,867,774	31,173,652	32,017,568	206,124	5,852,757	81,991	238,995	403
Dec-21	43,618,134	35,173,915	34,661,477	221,270	6,246,812	255,532	216,328	403
Total	546,807,678	443,427,363	410,552,839	2,647,259	81,638,747	1,022,569	3,261,231	4,746



California ISO

Actual and Estimated Volumes

Note: Actual data may vary between reporting cycles due to recalculation of settlement statements.

Charge Type:	Market Services	System Operations	CRR Services	Inter-SC Trades	Bid Segment Fees	CRR Auction Bid Fees	TOR Fees	SCID Fees
Charge Code:	4560	4561	4562	4512	4515	4516	4563	4575
Unit:	MWh & MW	MWh	MWh	# of trades	# of bid segments	# of nominations & bids	Minimum of TOR supply & demand	# of SCID's

2022 Estimated Units								
Jan-22	41,126,408	34,110,857	32,428,544	195,948	6,699,203	51,694	234,757	435
Feb-22	38,665,003	31,620,624	30,926,194	176,966	6,104,243	53,026	143,079	435
Mar-22	40,980,355	33,405,064	34,850,443	205,174	6,588,425	57,912	258,695	435
Apr-22	39,789,703	32,169,153	32,571,755	210,594	6,728,061	61,092	242,576	440
May-22	43,070,978	35,102,429	34,191,671	222,608	7,155,601	63,961	277,080	440
Jun-22	46,821,064	38,780,763	36,848,363	231,136	7,344,331	74,295	297,561	440
Jul-22	53,456,399	44,822,546	38,414,671	256,576	7,902,341	75,163	292,226	445
Aug-22	54,327,965	46,112,469	38,049,228	255,544	7,697,321	72,159	245,865	445
Sep-22	49,975,043	41,155,066	36,122,119	240,719	6,912,201	70,747	261,985	445
Oct-22	45,032,103	36,844,416	34,379,919	224,600	6,948,123	85,953	230,613	450
Nov-22	39,457,814	32,433,308	33,749,063	206,124	6,344,170	108,740	211,613	450
Dec-22	42,697,528	35,309,180	35,645,346	221,270	6,677,767	258,151	191,544	450
Total	535,400,363	441,865,875	418,177,317	2,647,259	83,101,786	1,032,895	2,887,595	5,310

Change from 2018 Actual	-0.8%	-2.2%	-48.7%	12.3%	15.5%	6.1%	-39.3%	36.2%
Change from 2019 Actual	1.2%	-0.2%	4.7%	-3.4%	0.5%	10.1%	-33.1%	28.2%
Change from 2020 Actual	1.0%	0.5%	-5.9%	-0.8%	-2.2%	-9.3%	-31.0%	23.0%
Change from 2021 Actual + Estimate	-2.1%	-0.4%	1.9%	0.0%	1.8%	1.0%	-11.5%	11.9%

[The latest GMC rates as well as a history of the rates is available on the Grid Management Charge page on the CAISO public site.](#)