



California ISO

---

# **2017 Budget and Grid Management Charge Rates**

---

**December 7, 2016  
FINAL**

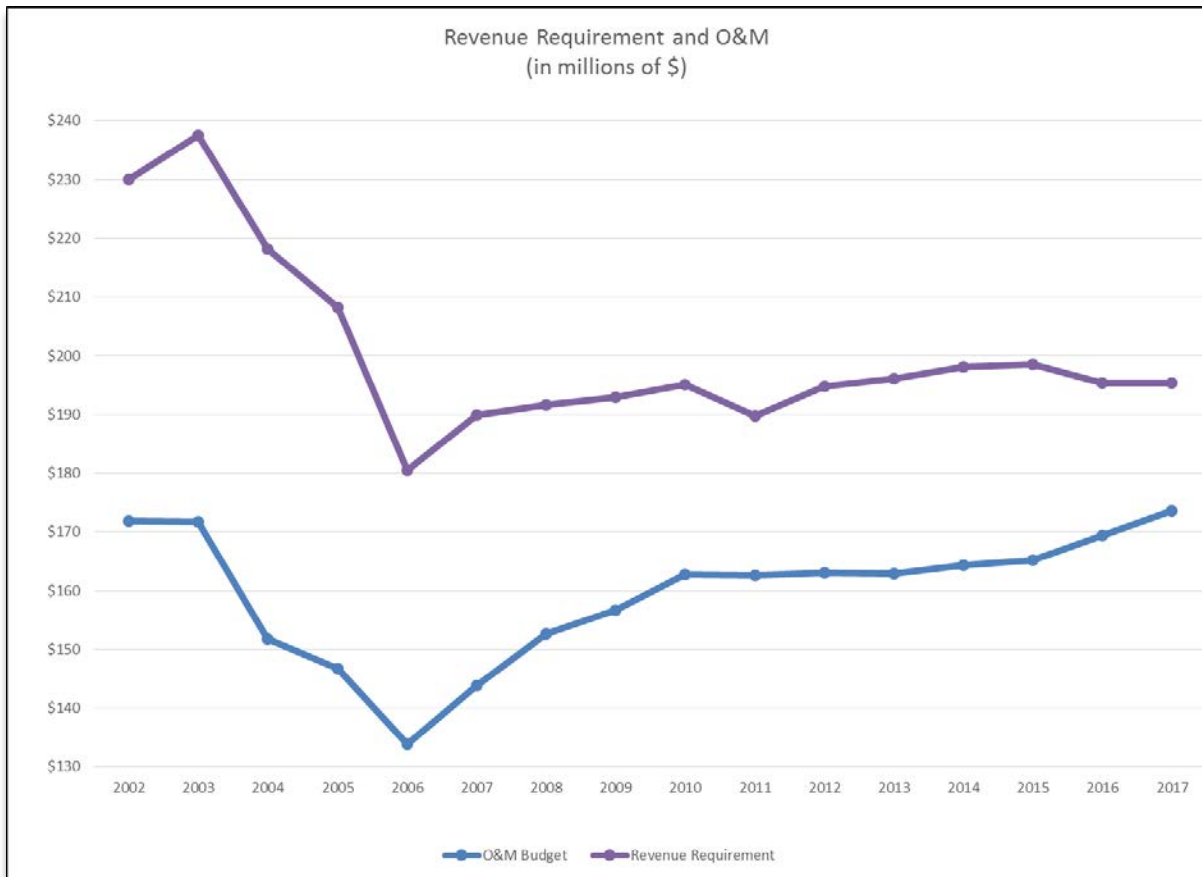
# 2017 Budget and GMC Rates

## TABLE OF CONTENTS

I.	2017 Revenue Requirement	3
	Components of 2017 Revenue Requirement.....	4
II.	Budget Overview	5
	Budget Guidance .....	6
	Strategic Outlook.....	6
	Aligning with the ISO's Strategic Plan .....	7
III.	Process View	8
	Support Customers and Stakeholders.....	10
	Develop Markets and Infrastructure.....	10
	Operate Markets and Grid .....	11
	Manage Human Capabilities .....	12
	Support Business Services .....	13
	Plan and Manage Business.....	14
IV.	ISO Resource Utilization	15
	Staffing .....	15
	Occupancy and Equipment Leases.....	18
	Telecommunications and Hardware and Software Maintenance Costs... 19	
	Consultants and Contract Staff .....	20
	Outsourced Contracts and Professional Fees .....	21
	Training, Travel and Other Costs .....	22
	Reconciliation of 2017 O&M Budget .....	23
V.	ISO Divisional Budget Overviews	24
	Chief Executive Officer Division.....	25
	Market and Infrastructure Development Division .....	27
	Technology Division.....	30
	Operations Division .....	33
	General Counsel Division .....	35
	Market Quality and Renewable Integration Division.....	38
	Customer and State Affairs Division.....	40
	Regional and Federal Affairs Division .....	43
VI.	Debt Service	46
VII.	Capital / Project Budget and Cash-Funded Capital	48
	Supplemental Board Approved Projects .....	48
	Capital / Project Budget Development Process .....	49
	Proposed Project List.....	50
VIII.	Other Costs and Revenue	52
IX.	Operating Cost Reserve Adjustment	53
X.	Unbundled Grid Management Charge Calculations	54
	Components of GMC and Billing Determinants .....	54
	Rate Calculation.....	54
	Summary of GMC Costs and Rates.....	56

# I. 2017 REVENUE REQUIREMENT

The 2017 budget provides for a revenue requirement of \$195.3 million, which represents no change from the 2016 revenue requirement. Fiscal discipline remains a priority for the California Independent System Operator Corporation as evidenced by the continued stability of the revenue requirement. Since 2007, the revenue requirement has averaged an annual increase of only 0.3%, and remains 18% lower than the peak in 2003. The ISO has absorbed several major initiatives during this time with no material impact to the revenue requirement, which include launching of the new market, construction of its secure primary and secondary locations, as well as the implementation of the western Energy Imbalance Market (EIM).



The Operations & Maintenance (O&M) budget is the major component of the revenue requirement, therefore, managing it is critical to keeping a stable revenue requirement. At \$173.6 million, this component makes up 89% of the 2017 revenue requirement, which is an increase of \$4.3 million from 2016.

While labor cost pressures have caused an increase to the O&M budget, higher other revenues and a larger operating cost reserve adjustment have allowed the revenue requirement to remain flat.

## Components of 2017 Revenue Requirement

A summary of the 2017 revenue requirement compared to 2016 follows:

Revenue Requirement Components (\$ in millions)	2017 Budget	2016 Budget	Change \$	Change %
Operations & Maintenance Budget	\$173.6	\$169.3	\$4.3	2.6%
Debt Service (including 25% reserve)	16.9	16.9	-	-
Cash Funded Capital	24.0	24.0	-	-
Other Costs and Revenues	(13.3)	(10.8)	(2.5)	23.1%
Operating Costs Reserve Adjustment	(5.9)	(4.1)	(1.8)	43.9%
<b>Total Revenue Requirement</b>	<b>\$195.3</b>	<b>\$195.3</b>	<b>\$ -</b>	<b>- %</b>
Transmission Volume in TWh	240.7	242.7	(2.0)	(0.5)%
Pro-forma bundled cost per MWh	<b>\$0.811</b>	\$0.805	\$0.006	0.8%

Projected 2017 volumes are based on the actual annual 2015 volumes and year-to-date 2016 volumes. The ISO projects that 2017 transmission volume will decrease to 240.7 TWh, which results in a bundled cost per megawatt-hour (MWh) of \$0.811, or an increase of \$0.006 per MWh from 2016.

The ISO recovers its 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. Section X of this document outlines the determination of GMC rates.

## II. BUDGET OVERVIEW

This budget package provides an overview of and detail for the 2017 cost of service and consists of the following items:

- O&M budget (Sections III thru V)
- debt service costs (Section VI)
- capital and 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 costs incurred for ongoing operations. The 2017 O&M budget of \$173.6 million is \$4.3 million greater than the 2016 O&M budget of \$169.3 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 (Section IV)
- by division — e.g., the Operations Division (Section V).

**Debt service costs** are the principal and interest payments related to the 2013 bonds, and collection of a 25% debt service reserve. The 2013 bonds refinanced the 2009 bonds (which the ISO issued to build a new headquarters facility in Folsom, California, and fund other capital expenditures). The total debt service to be collected in the 2017 revenue requirement (\$16.9 million) remains unchanged from 2016.

**Cash funded capital** included in the revenue requirement is \$24.0 million with any unencumbered amounts carried over to fund future years' capital requirements. Collecting capital as a component of the revenue requirement avoids additional costs with tax-exempt debt financing, which includes debt issuance costs, interest expense and the 25% debt service reserve.

**Capital and project requirements** for 2017 are budgeted for \$20 million. Significant work is anticipated for 2017, as shown on the proposed project list, and includes the need for systems development related to expanding market capabilities and integrating renewable resources.

**Other costs and revenues** that are offsets to the revenue requirement are budgeted to increase \$2.5 million in 2017 to \$13.3 million. These transactions include interest income, billings for generator interconnection studies, forecast fees collected from intermittent resources, path operator fees for the California-Oregon Intertie, and the EIM administrative charge.

The **operating cost reserve adjustment** is a credit of \$5.9 million in 2017. In any year that the ISO operating reserve account exceeds 15% of the prospective year's O&M budget, the excess reduces the revenue requirement for the following year. This adjustment also includes the 25% debt service reserve collected in 2016 and the difference between actual and budgeted revenues and expenses from 2015.

The **current GMC rate design** went into effect in 2012. The design provides for three volumetric charges and five transaction fees. The design was updated in 2014; the amendment was approved by FERC December 18, 2014 and was effective January 1, 2015. The amendment changed the percentages of the System Operations and Congestion Revenue Rights (CRR) service charges, the Transmission Ownership Rights (TOR) charge, and the revenue requirement maximum. The three volumetric charges are as follows:

- Market Services charge, which makes up 27% of the revenue requirement;
- Systems Operations charge, which comprises 70% of the revenue requirement; and
- CRR Services charge, which makes up 3% of the revenue requirement.

The **Market Services charge** applies to megawatt-hours (MWh) and megawatts (MW) of awarded supply and demand in the ISO market. The **Systems Operations charge** applies to MWh of metered supply and demand in the ISO controlled grid. The **CRR Services charge** applies to MWh of congestion.

## Budget Guidance

The ISO held its budget kick-off meeting with stakeholders in June 2016 with the clear intent to consider stakeholder input when building the 2017 budget. Notes from that discussion and subsequent stakeholder questions are available on the ISO website. In addition, with a firm commitment to fiscal responsibility, the ISO leadership required each division to develop an O&M budget consistent with the corporate Strategic Plan.

The combined efforts lead to the 2017 revenue requirement to come in at \$195.3 million, which is approximately \$7 million less than the FERC approved \$202 million cap. The budget achieves the goals outlined above and funds operations and initiatives as set forth in the company's Strategic Plan.

In August 2016, the ISO Board of Governors provided feedback on the preliminary budget. The ISO posted the preliminary budget along with accompanying exhibits to the ISO website for stakeholder review. Stakeholders had an opportunity to provide feedback during the budget workshop held on September 29, 2016. Discussion notes gathered during the budget workshop as well as responses to written questions submitted by stakeholders were posted on the ISO website.

## Strategic Outlook

The ISO is steadfast in its mission to maintain the reliability of the high voltage grid that serves California and market participants throughout the West. In recent years, the ISO has been leading the effort to create power markets and grid infrastructure that efficiently uses renewable generation resources while strengthening system resiliency, all to the benefit of consumers.

At this time, the ISO grid has over 19,000 megawatts (MW) renewable generation connected to the grid, including nearly 9,000 MW of solar and 6,000 MW of wind-powered capacity.

In close coordination and collaboration with generators, utilities, transmission owners, energy regulators and diverse stakeholder groups, the ISO is busy envisioning and implementing a grid and market structure that encourages Distributed Energy Resources (DERs). With regulatory approval gained in the fall of 2016, demand response electric vehicles, rooftop solar and energy storage can now be bundled together, or aggregated, into a single resource by entrepreneurs or utilities so that any extra energy they have can participate in the ISO wholesale market just like a utility-scale generator. This enhancement provides supply and liquidity to the market, as well as contributes to a more secure and sustainable electric generation and power delivery system. In addition, DERs will help reduce carbon emissions so the West can breathe cleaner air.

## **Aligning with the ISO's Strategic Plan**

The historic transition underway means the grid is becoming a flexible and adaptable system that will support a society and economy experiencing rapid technological advancement. The ISO is uniquely positioned to lead the transformation to improve services and enhance grid reliability. The ISO is committed to promoting growth and change while staunchly managing its own operating costs.

The 2017 budget aligns with the ISO's Strategic Plan, which is a guide to meet organizational and operational goals. The plan contains the following three strategies:

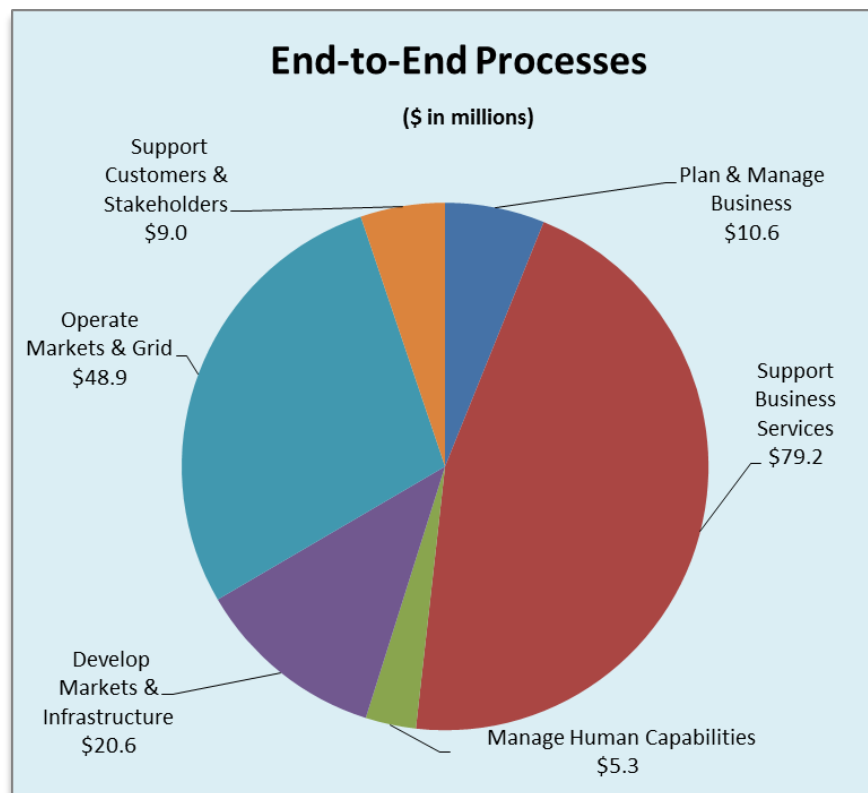
1. evolving market structures to encourage the participation of new clean energy resources, including demand response and storage;
2. ensuring that the resource fleet has the capability and flexibility to reliably meet electricity needs of our homes and businesses; and
3. taking a leadership role within the state and throughout the West to ensure we use our infrastructure investments to their fullest potential to benefit consumers and the future.

The Strategic Plan articulates to staff and management our common goals while the budget explains how the corporation funds and allocates its resources to support its business plans. The 2017 budget supports the Strategic Plan goals with just the right mix of staffing, skills and financial resources to be effective and successful.

Aligning the strategic planning process more closely with budget planning provides greater transparency into the ISO's resources and associated costs for business and operational activities. Not only is the ISO vigilant in containing costs, it also places a high emphasis on managing corporate resources in a smart and prudent manner that results in increased productivity.

### III. PROCESS VIEW

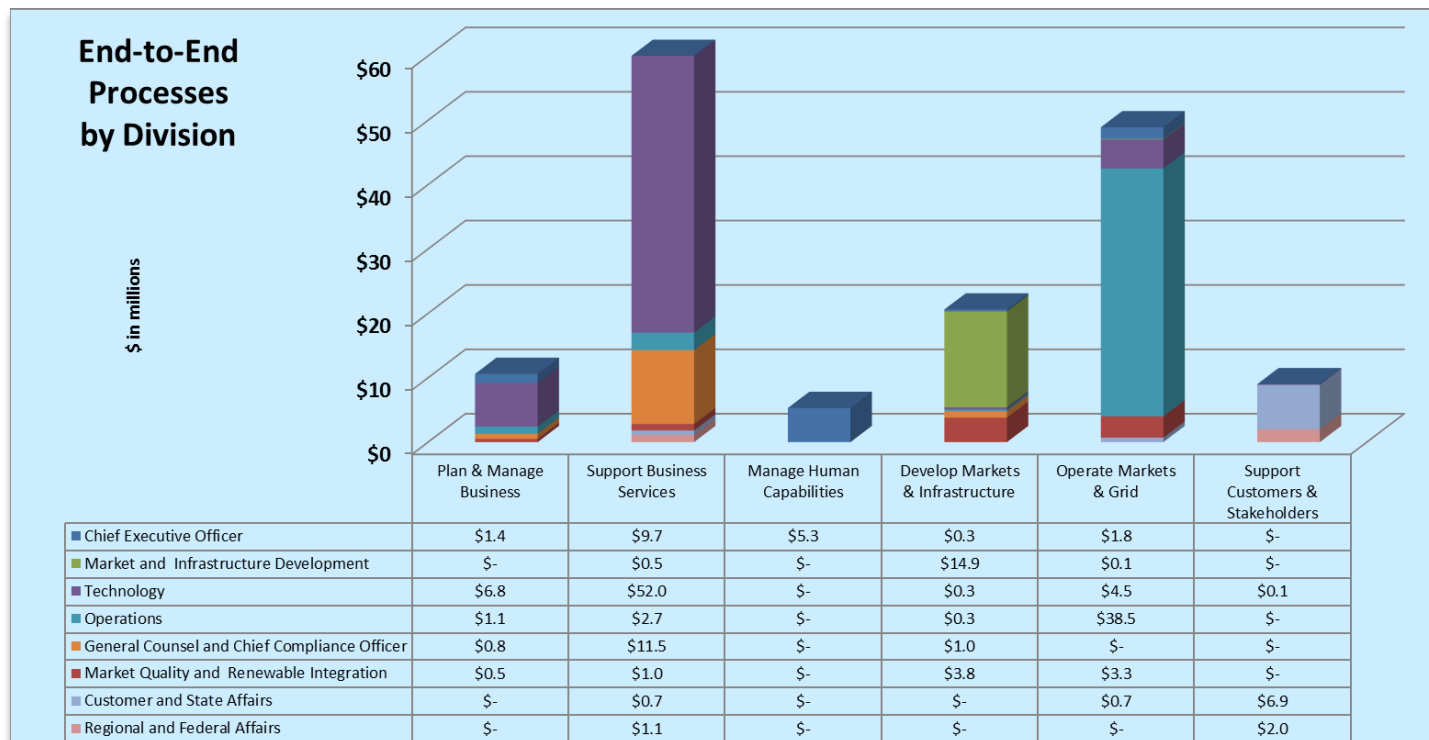
The ISO has leveraged the activity-based costing system to provide greater transparency and granularity in how the budget supports corporate business plans. In support of this system all employees record time worked to second level activities under nine primary processes. For purposes of this presentation, the nine processes were grouped into six processes. Aggregating the time reported by employees results in percentages for each of the processes (the hours from the first six months of 2016 were used). Applying these hours to the 2017 budget results in costs for the six processes as shown below.



- **Support customers and stakeholders** — client, account and stakeholder processes, government affairs and communications;
- **Develop markets and infrastructure** — regulatory, market, policy and product design and transmission planning, grid asset reviews and interconnection studies;
- **Operate markets and grid** — manage and operate the markets including modeling, setup, and settlements;
- **Manage human capabilities** — employee lifecycle, training and organizational development;
- **Support business services** — general, information technology, financial, legal and compliance support services; and
- **Plan and manage business** — strategic planning, governance, budgeting and project management.



Division costs are allocated into the end-to-end processes as follows.



The ISO Board has approved the following seven formal corporate goals.

**1. Sustain improved reliability and compliance levels:**

- continue to improve compliance with North American Electric Reliability Corporation and Western Electricity Coordinating Council reliability standards, and the ISO tariff by encouraging continuous self-monitoring; and
- manage federal performance standards to levels that ensure system reliability and optimal system costs.

**2. Advance the clean grid agenda:**

- enhance the participation of storage and aggregations of energy storage and other distributed energy;
- continue to advance demand shaping by designing a new system; and
- develop a vision of the grid to achieve 50% renewable energy resources in concert with the state’s energy agencies.

**3. Expand regional collaboration:**

- work with industry partners and stakeholders to extend the ISO’s real-time Energy Imbalance Market to non-ISO entities throughout the West.

**4. Enhance market performance:**

- reduce the number of price corrections and real-time congestion offset costs; and
- continue to improve the accuracy of the peak hour load forecast.

**5. Improve the ISO customer experience:**

- enhance customer transparency and improve overall inquiry resolution times.

**6. Advance corporate leadership capabilities and employee engagement:**

- improve employee engagement.

**7. Demonstrate fiscal responsibility:**

- efficiently manage the revenue requirement and its growth.

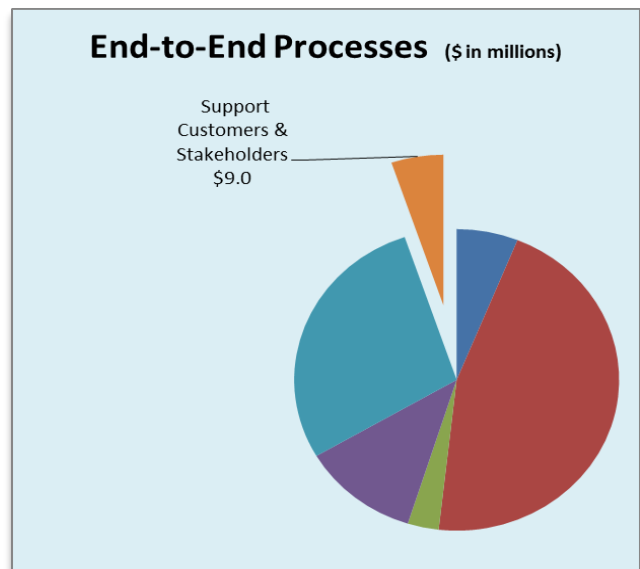
## Support Customers and Stakeholders

*Support Customers and Stakeholders*, amounting to \$9.0 million and 33 staff, consists primarily of the efforts of the Customer and State Affair division as well as the Regional and Federal Affair division along with elements of the Technology division.

The ISO remains firm in its commitment to provide the highest quality of service to its customers, market participants and stakeholders. This includes resolving customer issues in a timely manner and streamlining access to market information when possible.

### Primary Activities

This process improves the overall business experience stakeholders and market participants have with the ISO, as well as sharing clear and consistent corporate information. Besides surpassing previous goals to resolve inquiries quickly and encouraging quality dialogue between the ISO and its key customers, this activity provides the framework to make improvements in the stakeholder processes as well as build proactive outreach to new market participants that, in turn, encourages their active participation in the ISO market.



Another effort includes improving government affairs activities to more effectively share ISO technical expertise and communicate advice to government and regulatory bodies to advance policies and mandates that also protect grid reliability.

## Develop Markets and Infrastructure

*Develop Markets and Infrastructure* includes two separate processes that cover ISO activities designed to create value-added enhancements to the market design as well as

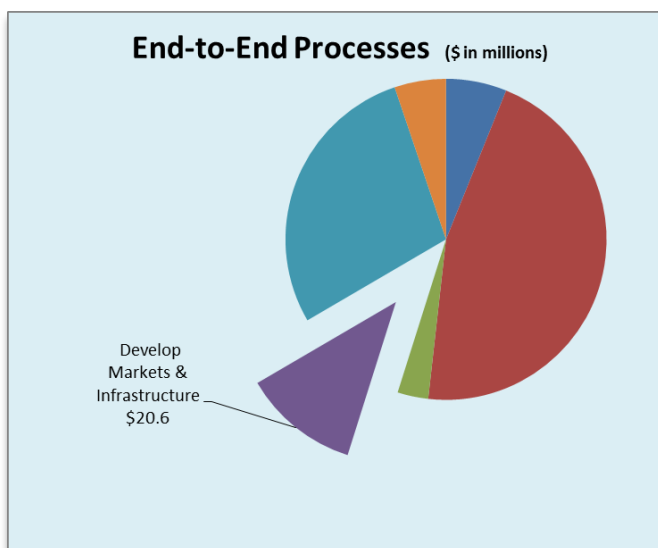
proactively plan and facilitate grid upgrades, such as those needed to reliably integrate renewable resources.

### **Develop Markets**

Develop markets, amounting to \$8.9 million and 29 staff, consists primarily of the efforts of the Market Infrastructure and Development, Market Quality and Renewable Integration and General Counsel and Chief Compliance Officer divisions with elements from the Technology and Operations divisions.

This activity includes improving our abilities to review and analyze the efficiency and quality of market results, as well as identifying needed market design enhancements to increase efficiencies and transparency.

Initiatives under this banner include building the business and operational framework to accommodate demand response and renewable resources in the ISO market, distributed generation, energy efficiency and storage technologies participation.



### **Develop Infrastructure**

Develop infrastructure, amounting to \$11.5 million and 44 staff, consists primarily of the efforts of the Market Infrastructure and Development division and elements of the Market Quality and Renewable Integration, Chief Executive Officer, Technology, Operations and General Counsel and Chief Compliance Officer divisions. The budget supports a comprehensive approach to transmission and generation interconnection planning that considers reliability and public policy needs.

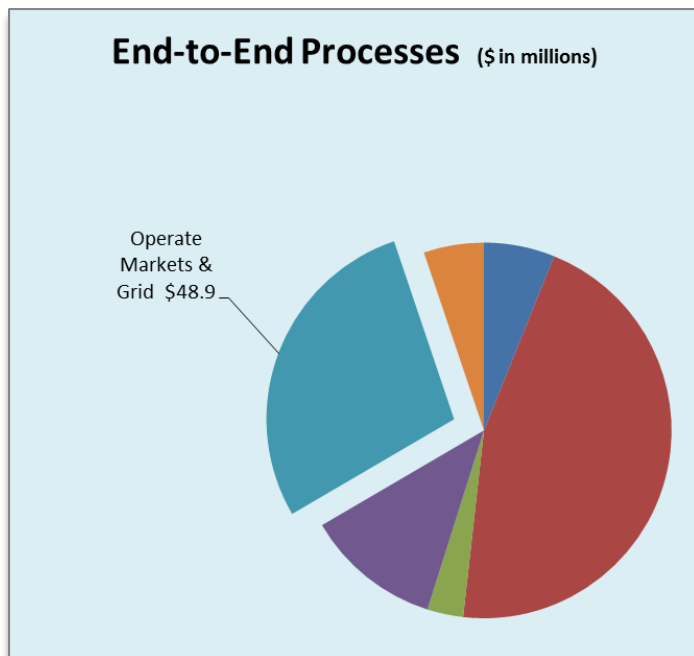
## **Operate Markets and Grid**

Three end-to-end processes make up *Operate Markets and Grid*: 1) Manage Market and Reliability Data and Modeling; 2) Manage Markets and Grid; and 3) Manage Operations Support and Settlements.

### **Manage Market and Reliability Data and Modeling**

Manage Market and Reliability Data and Modeling, amounting to \$13.4 million and 54 staff, is primarily comprised of functionalities of the Operations, Technology, and Chief Executive Officer divisions with elements of the Customer and State Affairs, Market and Infrastructure Development, and Market Quality and Renewable Integration divisions.

The ISO diligently rechecks its network modeling policies and protocols to reduce out-of-market energy dispatches, assure models reflect all grid constraints and produce timely and accurate prices.



### **Manage Markets and Grid**

Manage Markets and Grid, amounting to \$24.0 million and 109 staff, is primarily comprised of functionalities of the Operations, Technology and Market Quality and Renewable Integration divisions with elements of the Chief Executive Officer division. A challenging ISO responsibility is to manage transmission and generation outages, especially those that are unplanned, as it takes well-honed grid expertise to ensure continuous flow of power to all customers. Managing the market includes executing the day-ahead market and interchange scheduling that meets all local

energy needs and delivers the power at the most reasonable cost.

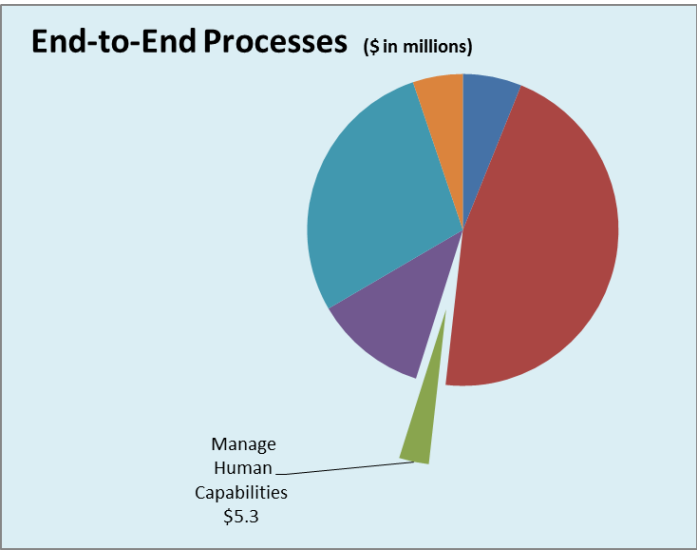
### **Manage Operations Support and Settlements**

Manage Operations Support and Settlements, amounting to \$11.7 million and 49 staff, is mostly comprised of functionalities of the Operations and Market Quality and Renewable Integration divisions along with elements of the Technology, Chief Executive Officer, General Counsel and Chief Compliance Officer and Regional and Federal Affairs divisions. The budget provides the resources that result in creating new market efficiencies. This effort includes lowering the financial risk of participating in the wholesale market that in turn lowers the cost of doing business with the ISO. The lower cost translates into less overhead for ISO customers who can pass the savings on to ratepayers.

## **Manage Human Capabilities**

*Manage Human Capabilities*, amounting to \$5.3 million and 15 staff, consists of the efforts of the Chief Executive Officer division. It 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.

The budget provides resources to support the ISO's ability to attract and retain uniquely skilled and highly sought-after professionals by continually assessing the quality of compensation and benefit packages offered. The benefits menu reflects cost



containment measures while at the same time preserving the competitive options needed to meet the needs of a diverse employee population.

Developing the next ISO generation equipped with the knowledge, skills and expertise to meet the increasingly complex challenges of today and the future remains a top corporate priority. The budget provides resources to ensure employees not only grow in their jobs but also increase their value to the corporation.

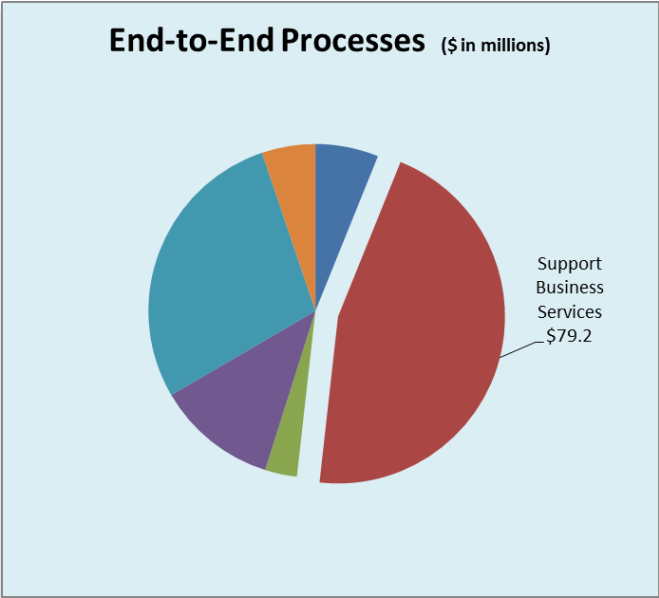
In addition, the budget provides resources to support management and employees in maintaining a high-performance and respectful workplace environment where employees are highly engaged in pursuing their highest potential as well as contributing to the corporation’s success.

**Support Business Services**

*Support Business Services*, amounting to \$79.2 million and 235 staff, is comprised primarily of functionalities of the Technology, General Counsel and Chief Compliance Officer, Chief Executive Officer, and Operations divisions with elements of all other divisions.

This process provides the resources to improve the ISO’s ability to carry out its business duties by developing well defined, measured and controlled processes (workflow and information technology), as well as nurturing disciplined business decision making, maintaining quality assurance and efficiently implementing enhancements.

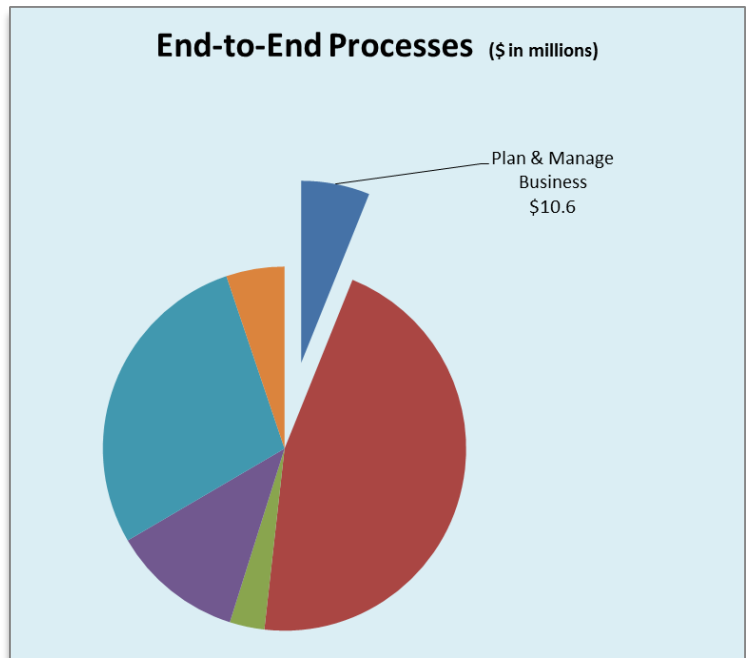
In addition, this process supports the initiatives that improve and maintain a responsive and effective compliance culture.



## Plan and Manage Business

The *Plan and Manage Business* process, amounting to \$10.6 million and 32 staff, consists primarily of the efforts of the Technology, Chief Executive Officer, and Operations divisions with elements of the General Counsel and Chief Compliance Officer, Market Quality and Renewable Integration, and Regional and Federal Affairs divisions.

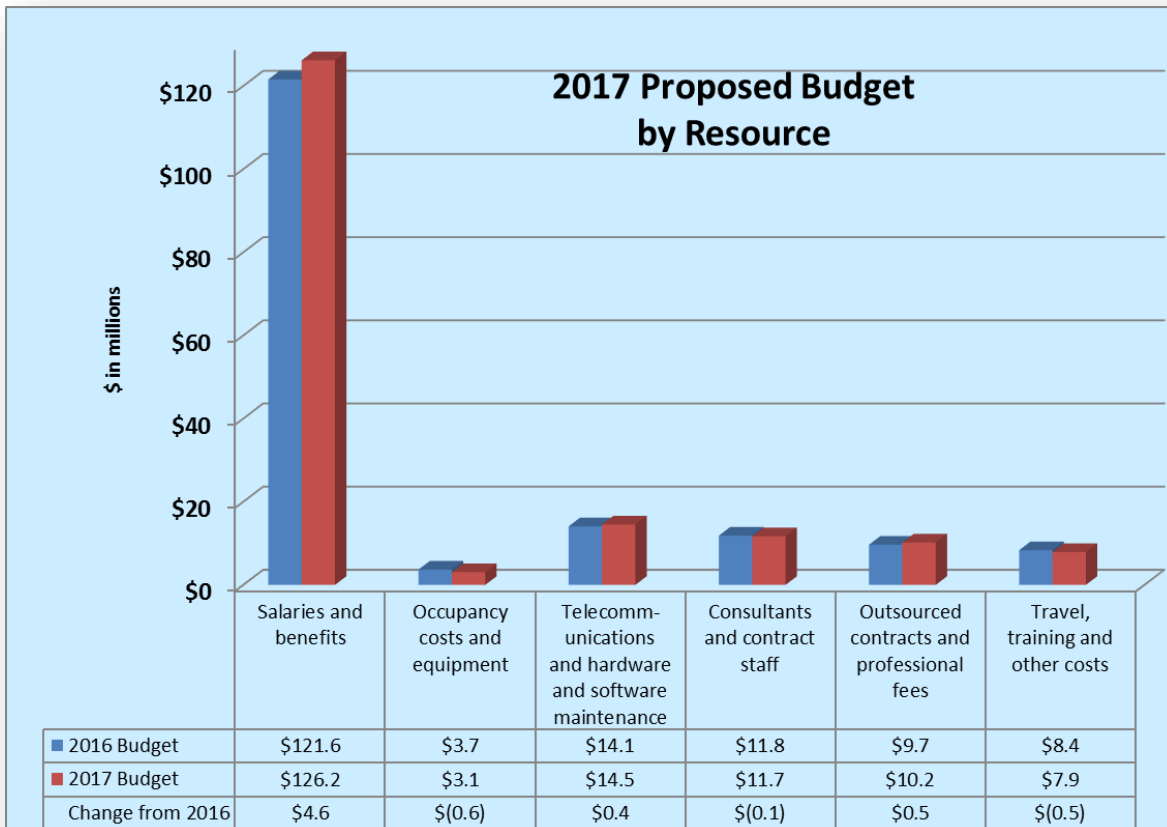
The ISO measures every process, project or policy against identified benefits. This activity finds support in part by aligning the strategic planning process with budget planning, as outlined in Section II: Aligning with the ISO's Strategic Plan.



It is the budget process that drives revenue requirement needs, which then translates into the rates charged to scheduling coordinators and other market participants.

## IV. ISO RESOURCE UTILIZATION

This section deals with the resources used in the O&M budget to accomplish strategic objectives and goals. The 2016 budget reflects reclassifications in order for it to be comparable to the 2017 budget presentation. The chart below shows the major resource components.



### Staffing

The ISO depends on its highly educated employees to operate the grid, which makes staff a critically important resource with salaries and benefits comprising 73% of the 2017 O&M budget and 72% of the 2016 O&M budget.

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 ISO's Strategic Plan, and better reflect end-to-end business processes.

The budgeted staffing level for 2017 is 600 employees (which includes eight operators in training); the staffing level has increased by 7 from the budgeted 2016 staffing level to address growth needs.

As of the beginning of December 2016, there are 596 full time employees. As that equals 99% of the 2017 budgeted staffing level, the 2017 budget makes no provision for vacancies. A summary of the budgeted headcount for 2017 and 2016 is as follows.

Projected Staffing Levels	2017 Budget	2016 Budget	Change
Chief Executive Officer	51	51	-
Market and Infrastructure Development	60	58	2
Technology	191	190	1
Operations	200	196	4
General Counsel and Chief Compliance Officer	32	32	-
Market Quality and Renewable Integration	24	24	-
Customer and State Affairs	34	34	-
Regional and Federal Affairs	8	8	-
<b>Gross Headcount</b>	<b>600</b>	<b>593</b>	<b>7</b>
Less Program Office Staff Included in Capital	(5)	(5)	-
<b>Net Headcount</b>	<b>595</b>	<b>588</b>	<b>7</b>

Staffing costs for 2017 are budgeted at \$126.2 million, which is an increase of \$4.6 million, or 4%, over \$121.6 million in 2016.

### Staffing Related to Capital

As in past years, the O&M budget does not include the costs of ISO staff dedicated full-time to capital projects, which are components of a separate capital budget. The capitalized staff amounted to five full-time staff in the Program Management Office of the Technology division. 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 2017 compensation budget includes funding for employee base salaries, benefits and payroll taxes, as well as other compensation elements, such as overtime and performance compensation, and related costs such as relocation and tuition reimbursement. The budget also includes funds for 2017 salary adjustments for merit, equity and market adjustments, as well as for increased healthcare costs. 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 that qualified third-party vendors confidentially administer to gather information on competitive market pay rates. The ISO's ability to attract and retain talent with the necessary skills and knowledge links directly 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 components of compensation is as follows.

<b>Compensation Components With Benefit Burden (\$ in millions)</b>	<b>2017 Budget</b>	<b>2016 Budget</b>	<b>Change</b>
Base Compensation	\$104.1	\$99.5	\$4.6
Overtime (includes structured overtime for grid operators)	6.3	6.8	(0.5)
Performance Compensation	14.5	13.9	0.6
Other	1.3	1.4	(0.1)
<b>Total Personnel Expense</b>	<b>\$126.2</b>	<b>\$121.6</b>	<b>\$4.6</b>

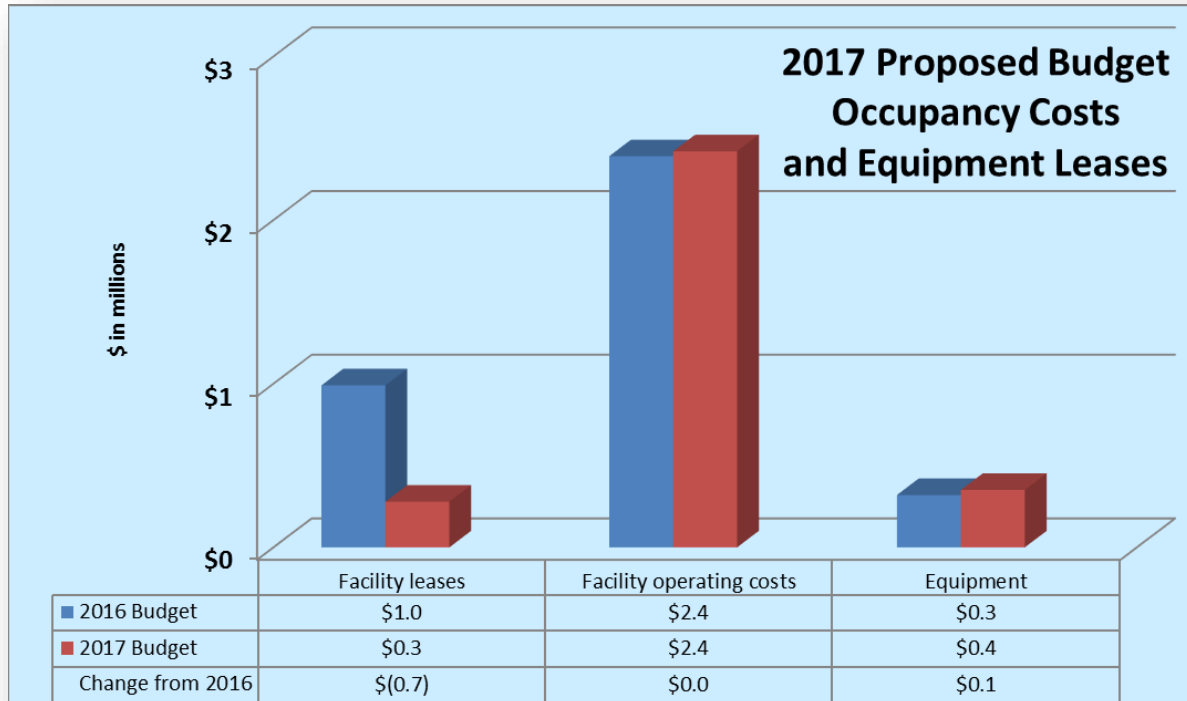
To fund the benefits, employee benefits are budgeted at 36% of salary costs as summarized in the table below, which is a 1% increase over the 2016 rate. Management will enter into contracts with selected vendors to ensure these benefits are available to eligible employees with the costs primarily depending on employee population levels and participation. The benefits burden is broken down as follows.

<b>Benefit Obligation</b>	<b>ISO Cost Components</b>	<b>Rate</b>
Health and Welfare Plans Medical, Dental and Vision	Medical, dental and vision; life, accidental death and long-term disability insurance; state unemployment insurance; and worker's compensation	14%
Retirement Benefit Plans	Retirement Savings Benefit Plan 401(k); Federal social security and Medicare; executive retirement plans; and Retiree Medical Benefit Plan	21%
Other Obligations	Administration related costs	1%
<b>Total Burden</b>		<b>36%</b>

## Occupancy and Equipment Leases

Occupancy and equipment costs decreased by \$640,000, or 17% to \$3.1 million in 2017. These costs make up approximately 2% of the 2017 and 2016 budget.

Facility leases decreased by \$670,000, or 69%, to \$310,000 in 2017 from \$990,000 in 2016. The 2017 budget reflects the impact of the move to the new Lincoln Operations Center (LOC) and vacating the leased Alhambra backup facility.

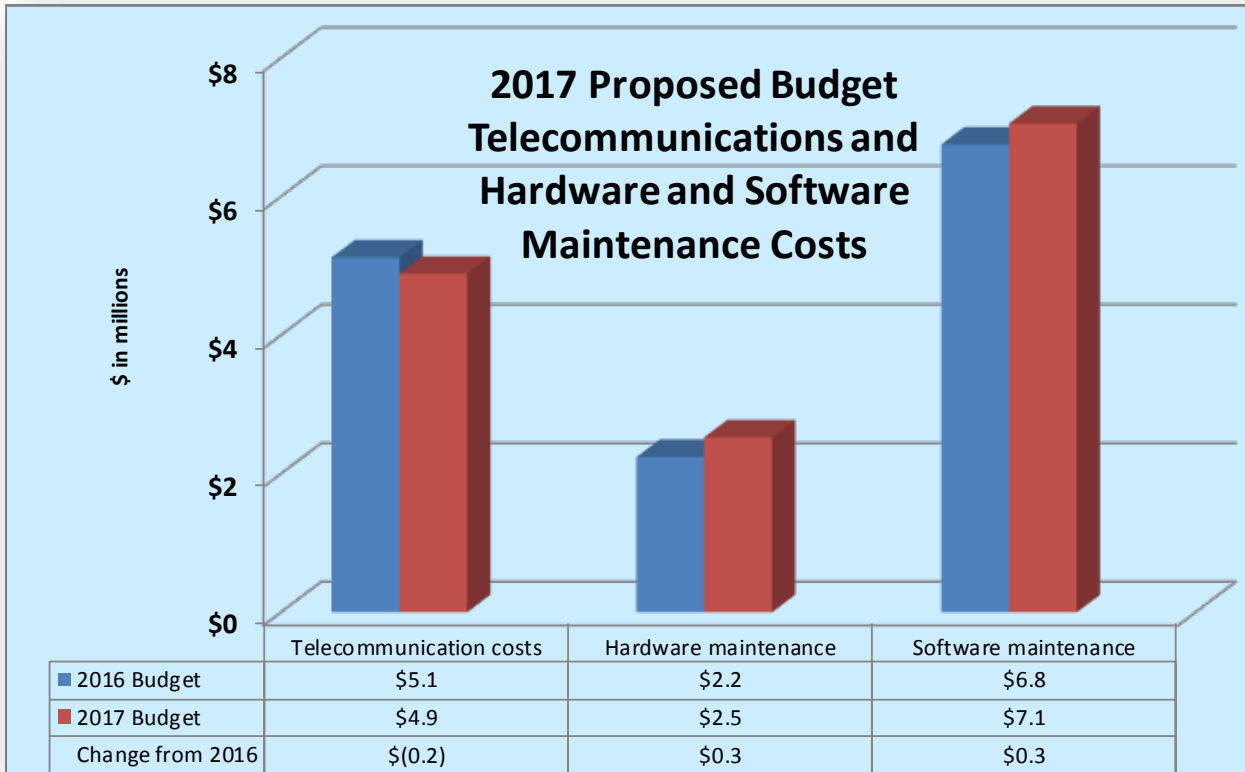


Facility operating costs remain unchanged at \$2.4 million in 2017 from 2016.

Equipment expense increased by 6% from 2016 due to planned non-capitalizable LOC facility furniture purchases.

## Telecommunications and Hardware and Software Maintenance Costs

Telecommunications, hardware and software maintenance costs increased \$400,000, or 2.8%, to \$14.5 million compared to \$14.1 million in 2016. These costs make up approximately 8% of the 2017 and 2016 budgets.

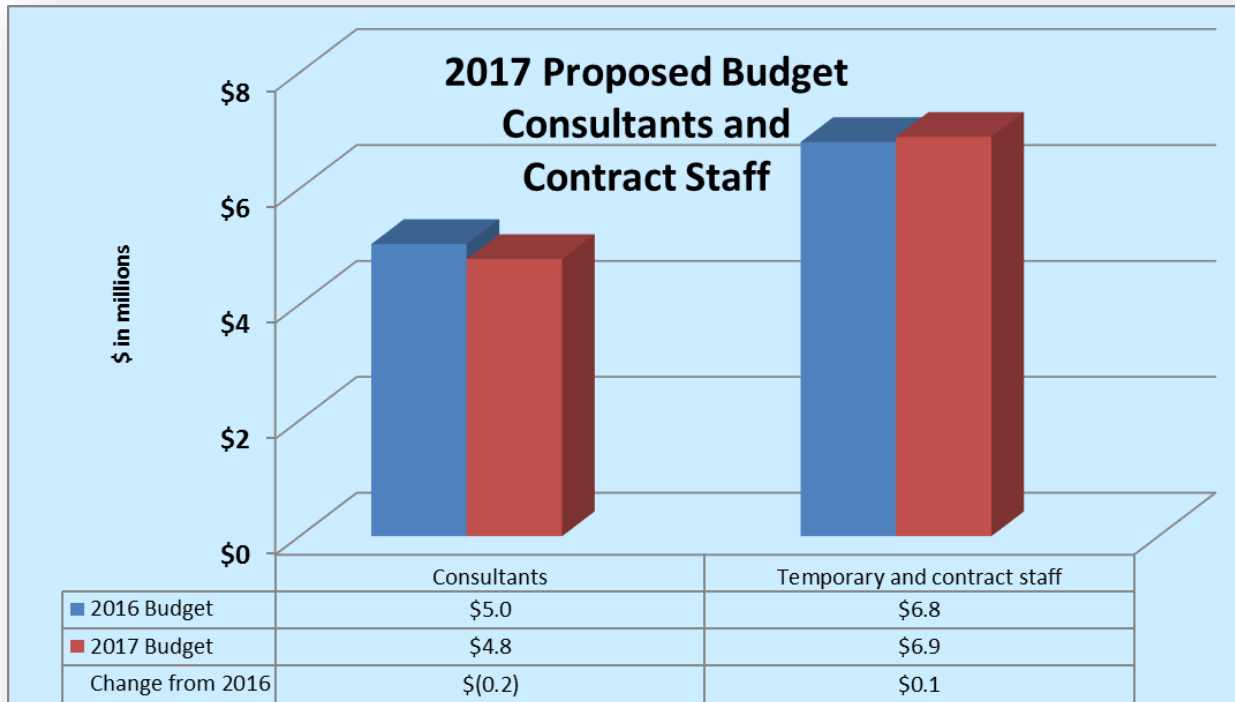


Telecommunication costs decreased \$200,000, or 5%, to \$4.9 million in 2017 from \$5.1 million in 2016. The decrease is due to improved contracted telecommunications rates as well as continued management of wired line and mobility services.

Hardware and software maintenance costs increased by \$600,000, or 6% to \$9.6 million in 2017 compared to \$9.0 million in 2016. Whereas the ISO strives to control hardware and software maintenance growth and make improvements where available, it is not immune to the technology industry's rate increases.

## Consultants and Contract Staff

Consulting and contract staff costs decreased \$230,000, or 2%, to \$11.7 million in 2017 compared to \$11.8 million in 2016. The consulting and contract staff budgets make up 7% of both the 2017 and the 2016 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 (contractors, consultants or temporary staff). At times, the Company may bring contractor work in-house when it is of an ongoing nature and lowers overall cost with the same or better service quality. Examples of efforts requiring budget in 2017 include resource adequacy studies, process assessments, training, regional coordination and integration initiatives, and the need for subject matter experts in fields such as meteorology and renewable integration.

## Outsourced Contracts and Professional Fees

Outsourced contracts and professional fees increased by \$510,000, or 5%, to \$10.2 million in 2017. The budget category makes up 6% of the 2017 and 2016 budgets.



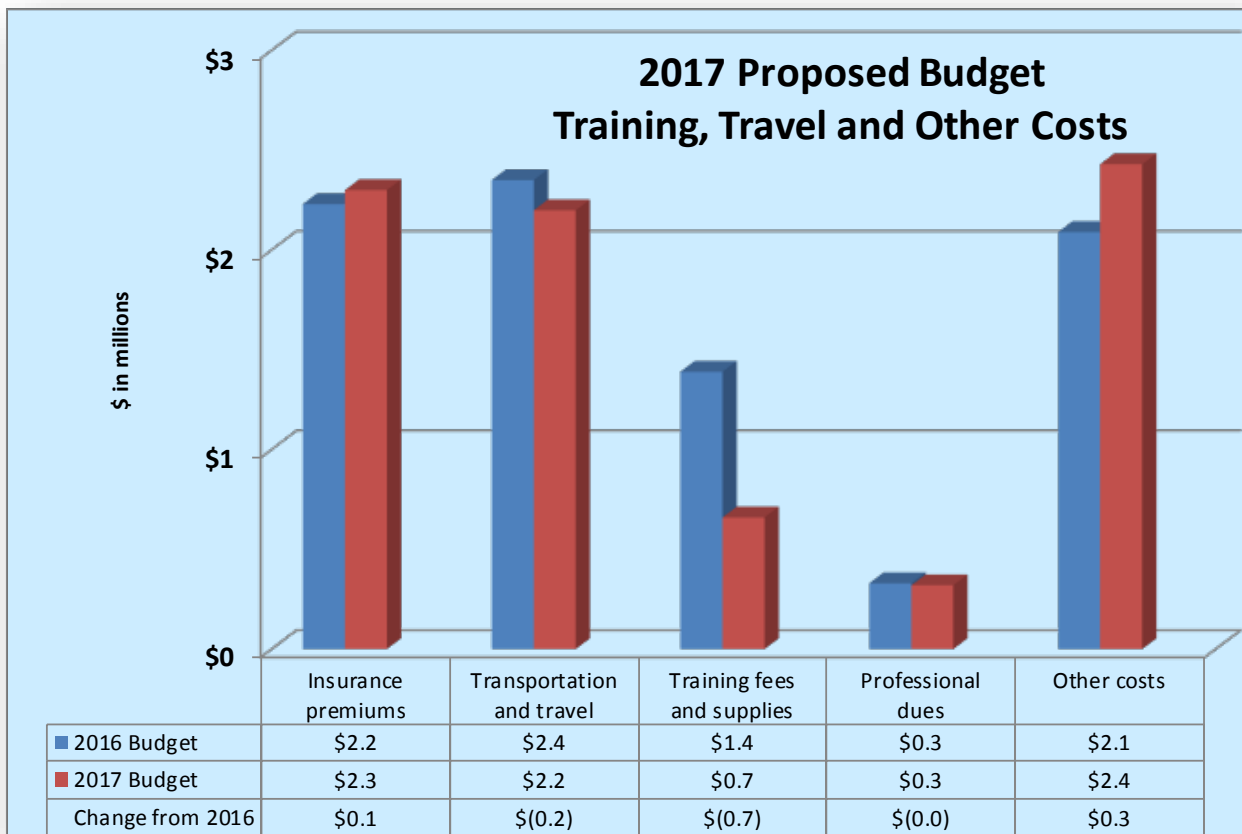
Professional fees remained unchanged at \$4.2 million in 2017 from 2016. This represents a stable level of support anticipated around the need for outside legal services in 2017.

Outsourced and other contracts combined increased to \$5.9 million in 2017 from \$5.4 million in 2016. This increase represents a change within the Technology division as the Software as a Service (SaaS) model becomes increasingly more commonplace for applications. The other large component of this resource category is our forecasting fees. These are expected to remain unchanged for 2017 when compared to 2016. Intermittent resources pay a forecasting fee to the ISO of 10 cents per megawatt of generation. Such fees are budgeted for a total of \$2.1 million in 2017. These fees received from the variable resources are included in other costs and revenues to offset the related forecasting costs.

## Training, Travel and Other Costs

Training, travel and other costs decreased \$380,000, or 5%, to \$7.9 million in 2017 from \$8.4 million in 2016. These costs make up approximately 5% of the 2017 and 2016 budgets.

Insurance premiums increased \$70,000, or 3%, to \$2.3 million in 2017 from \$2.2 million in 2016.



Transportation and travel decreased \$150,000, or 4%, to \$2.2 million in 2017 from \$2.4 million in 2016 primarily due to the backup facility relocation from Alhambra to Lincoln.

Training fees and supplies decreased \$700,000, or 4%, to \$660,000 in 2017 from \$1.4 million in 2016 primarily due to a shift in the categorization of corporate training expenses.

Professional dues remains unchanged at \$330,000 in 2017.

Other costs (primarily bank fees, conference fees, office supplies and Board and stakeholder meeting costs) increased to \$2.4 million in 2017 from \$2.1 million in 2016. The increase is primarily attributable to additional regional and EIM activities including the new EIM Board.

## Reconciliation of 2017 O&M Budget

The 2017 proposed O&M budget increased by \$4.3 million, or 2.5%, to \$173.6 million compared to \$169.3 million in 2016.

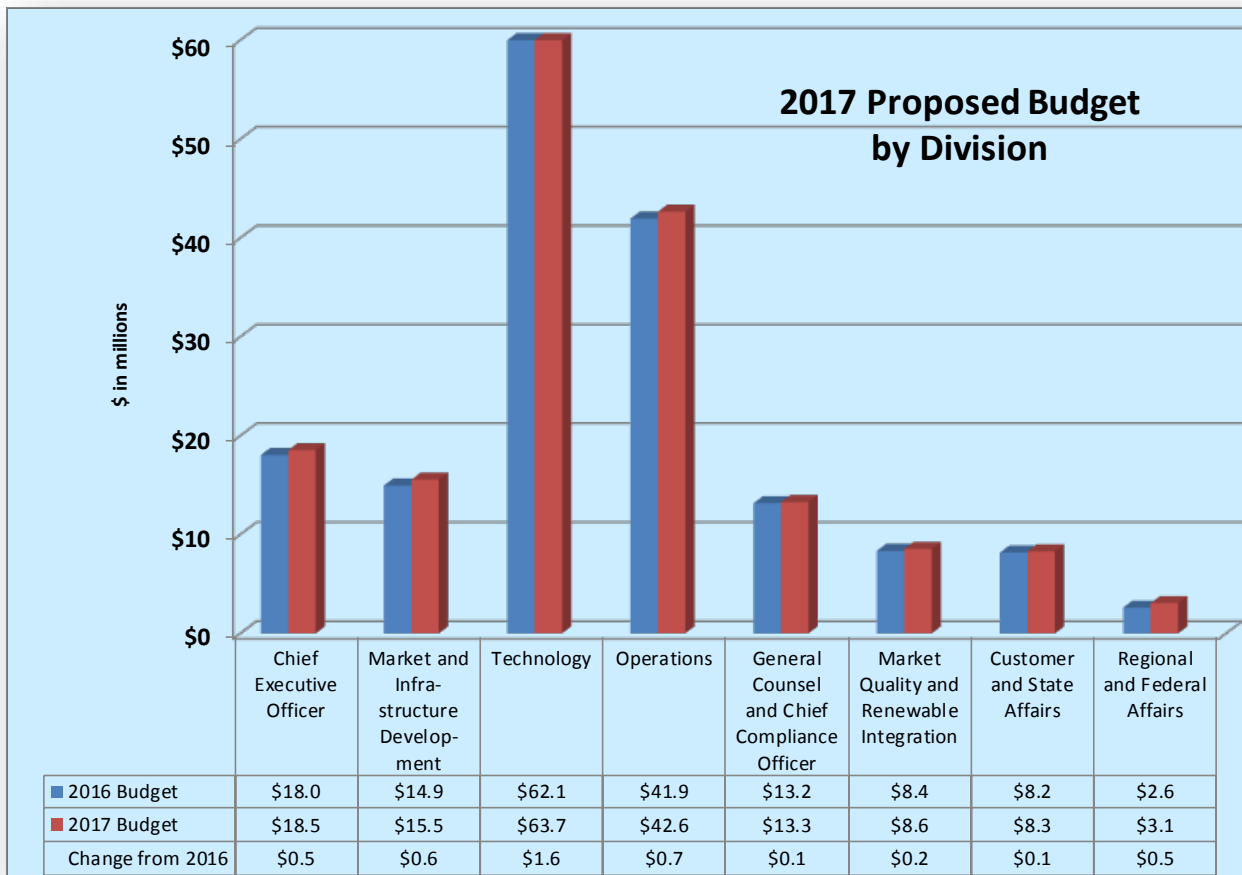
A reconciliation of the change follows (\$ in millions):

<b>2016 O&amp;M Budget</b>	<b>\$169.3</b>
<b>Increases in the Budget</b>	
Merit and other compensation increases	5.3
Increase in other contracts and services	0.6
Increase in office and Board costs	0.3
Increase in hardware and software maintenance contracts	0.6
Insurance premium increases	0.1
<b>Net Increases in the Budget</b>	<b>6.9</b>
<b>Decreases in the Budget</b>	
Reduction in facility operating expenses, leases	(0.7)
Reduction in training fees & supplies	(0.7)
Reduction in overtime	(0.5)
Reduction in consultants	(0.3)
Reduction in travel	(0.1)
Reduction in outside legal and audit services	(0.1)
Reduction in telephone/network	(0.1)
Reduction in all other	(0.1)
<b>Net Decreases in the Budget</b>	<b>(2.6)</b>
<b>Proposed 2017 O&amp;M Budget</b>	<b>\$173.6</b>

## V. ISO DIVISIONAL BUDGET OVERVIEWS

Each corporate division provides a description of their department, functions, staffing and proposed budget. The divisions appear in the following order:

- Chief Executive Officer
- Market and Infrastructure Development
- Technology
- Operations
- General Counsel and Chief Compliance Officer
- Market Quality and Renewable Integration
- Customer and State Affairs
- Regional and Federal Affairs



The 2017 budget of \$173.6 million is \$4.3 million, or 2.5%, more than the 2016 budget of \$169.3 million. Budgeted staffing has increased to 600 for 2017 from 593 in 2016. The increase in headcount reflects the need to address corporate wide growth.

The Technology and Operations divisions account for approximately 37% and 24%, respectively, of the 2017 O&M budget, while the Chief Executive Officer division comprises 11%. The Market and Infrastructure Development division accounts for 9%



of the 2017 O&M budget, while the General Counsel and Chief Compliance Officer division accounts for 8%, the Customer and State Affairs and the Market Quality and Renewable Integration divisions each account for 5%, and the Regional and Federal Affairs division accounts for 2%.

There were various organizational changes made during 2016, which were driven by the ISO's goal to optimize efforts, resulting in staff transfers among and within the divisions. This includes restructuring of the Policy and Client Services division into two separate divisions: Customer and State Affairs and Regional and Federal Affairs. For comparability purposes, the 2016 budget reflects reclassifications to align with the 2017 budget presentation.

## Chief Executive Officer Division

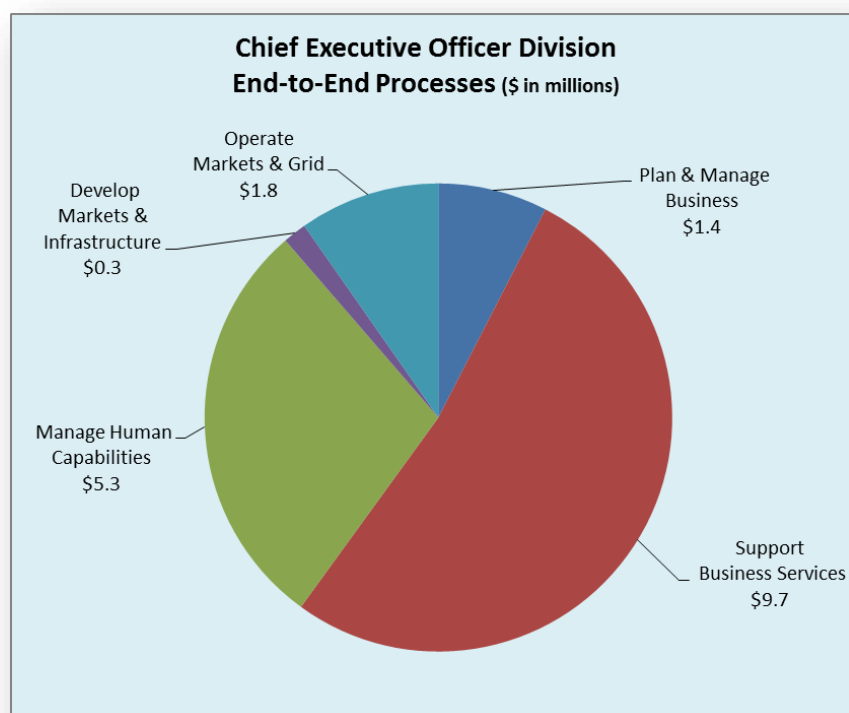
This division comprises the office of the Chief Executive Officer, Department of Market Monitoring, as well as the Finance and Human Resources departments.

The **Department of Market Monitoring** is active in shaping ISO policies that enhance market efficiency and mitigate the exercise of market power. These policies are especially important as new market features and services are implemented to facilitate renewable resource development.

The department maintains a close, watchful eye on the wholesale energy markets by monitoring participant activity to ensure rules are followed and free from non-competitive behavior, and that market results are producing effective and efficient outcomes.

The department continues to review and provide feedback regarding the effectiveness of the 15-minute market and western Energy Imbalance Market.

The department plays a significant role in providing input on major market design initiatives, as well products and requirements the ISO is developing to ensure sufficient

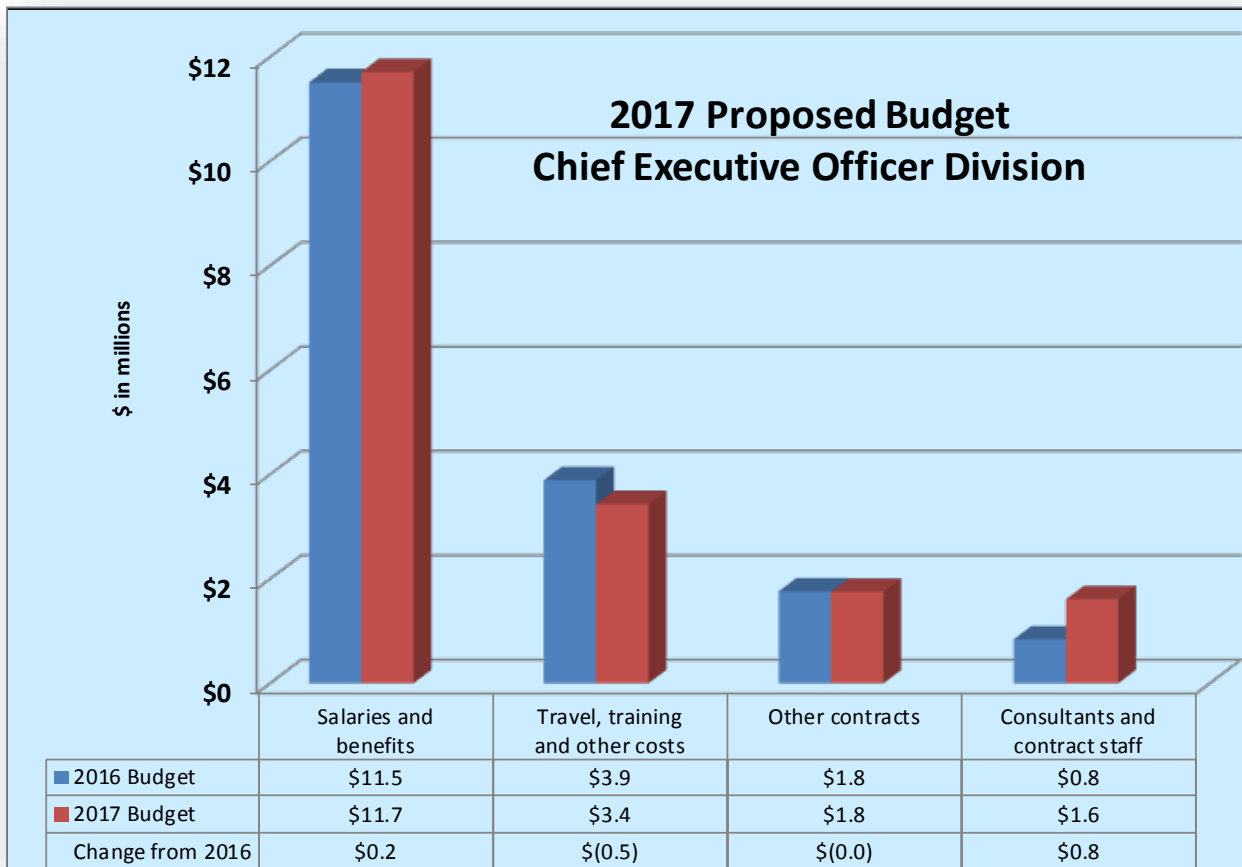


flexible capacity is available to integrate increasing amounts of variable renewable energy. The department is also working closely with the Market Quality and Renewable Integration division to review and highlight the challenges associated with excess generation conditions that occur as more renewable resources are interconnected to the grid.

The **Finance department** consists of the Chief Financial Officer, treasury, credit, accounting, financial planning and procurement teams. It is responsible for managing ISO cash and investments, insurance, credit and collateral management, clearing of the ISO market, general accounting, internal and external financial reporting, payables processing, financial planning and forecasting, budgeting, and administering the GMC. It also procures goods and services for the corporation by efficiently selecting vendors, negotiating corporate savings, negotiating and managing commercial contracts, and managing costs.

The **Human Resources department** establishes the policies, programs and “people” strategies that enable the Corporation to attract and retain the uniquely talented professionals needed to reliably operate the electric grid and meet ISO strategic objectives and goals. Developing the next generation of ISO people includes a dedicated focus on enhancing their knowledge and skills; continuing to develop technical experts; strengthening leadership and managerial capabilities; retaining and recruiting targeted skills for critical areas; and sustaining an engaging workplace environment.

## Discussion of Proposed Budget



The 2017 budget of \$18.5 million increased by \$500,000, or 3%, from the 2016 budget. Staffing remains at 51 in 2017.

Personnel costs increased by \$220,000 primarily due to merit increases.

Consultants and contract staff increased \$770,000 primarily due to a shift in the categorization of corporate training expenses.

Outsourced contracts and professional fees of \$1.8 million remained at the same level as 2016.

Training, travel, and other costs decreased \$470,000 primarily related to a shift in the categorization of corporate training expenses.

## Market and Infrastructure Development Division

The Market and Infrastructure Development division is leading the work in developing the rules and processes that will support a modern grid powered with clean energy.

Grid planners analyze infrastructure needs that serve as the foundation for a comprehensive 10-year forward-looking transmission plan each year that accommodates the growth in renewable resources as well as maintains and strengthens grid reliability. In addition, division staff perform studies for resources seeking to interconnect to the grid. The division also plays a central role in developing policies to support a robust market, and timely and efficient infrastructure development. Finally, the division is also responsible for negotiating, executing and tracking compliance with contractual agreements between the ISO and external entities, such as power plant owners and operators.

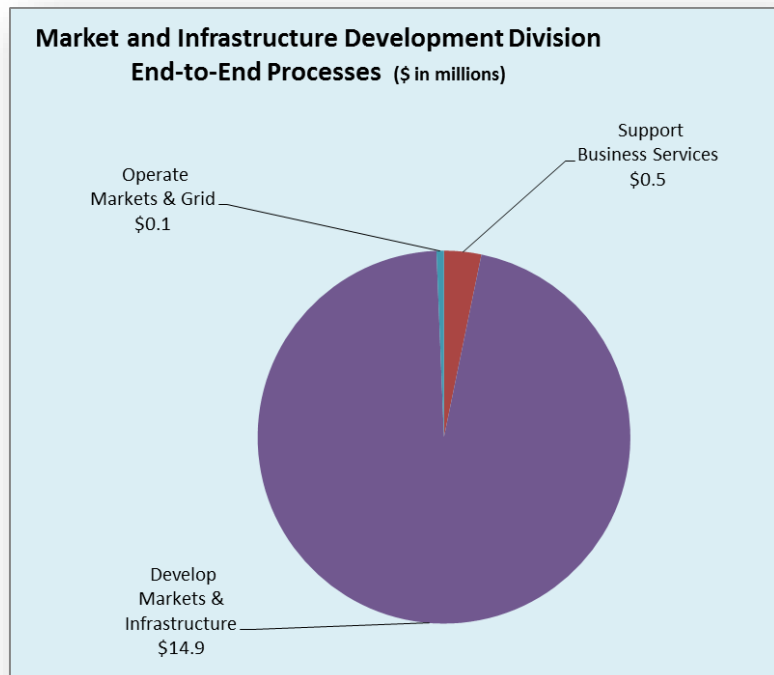
The division also provides subject matter expertise to state regulators on issues related to grid reliability and market efficiency, as well as the implementation of legislative mandates such as the Renewables Portfolio Standard, reducing greenhouse gases and increasing demand response participation in the wholesale market.

A main priority for the division is developing the market mechanisms needed to expand the ISO's day ahead market to balancing areas throughout the West.

Creating a west-wide regional market can play a critical role in managing and efficiently using renewable resources, meeting state and federal environmental goals and sharing low cost energy across a wide geographic area.

The division focuses substantial time and effort in developing the rules and mechanisms to efficiently and reliably integrate renewable resources and advance the ability of distributed energy resources to participate in the wholesale energy market, which includes energy storage, electric vehicles and rooftop solar. In addition, the division continually looks for ways to enhance transmission planning and generator interconnection processes needed to meet state energy and environmental goals.

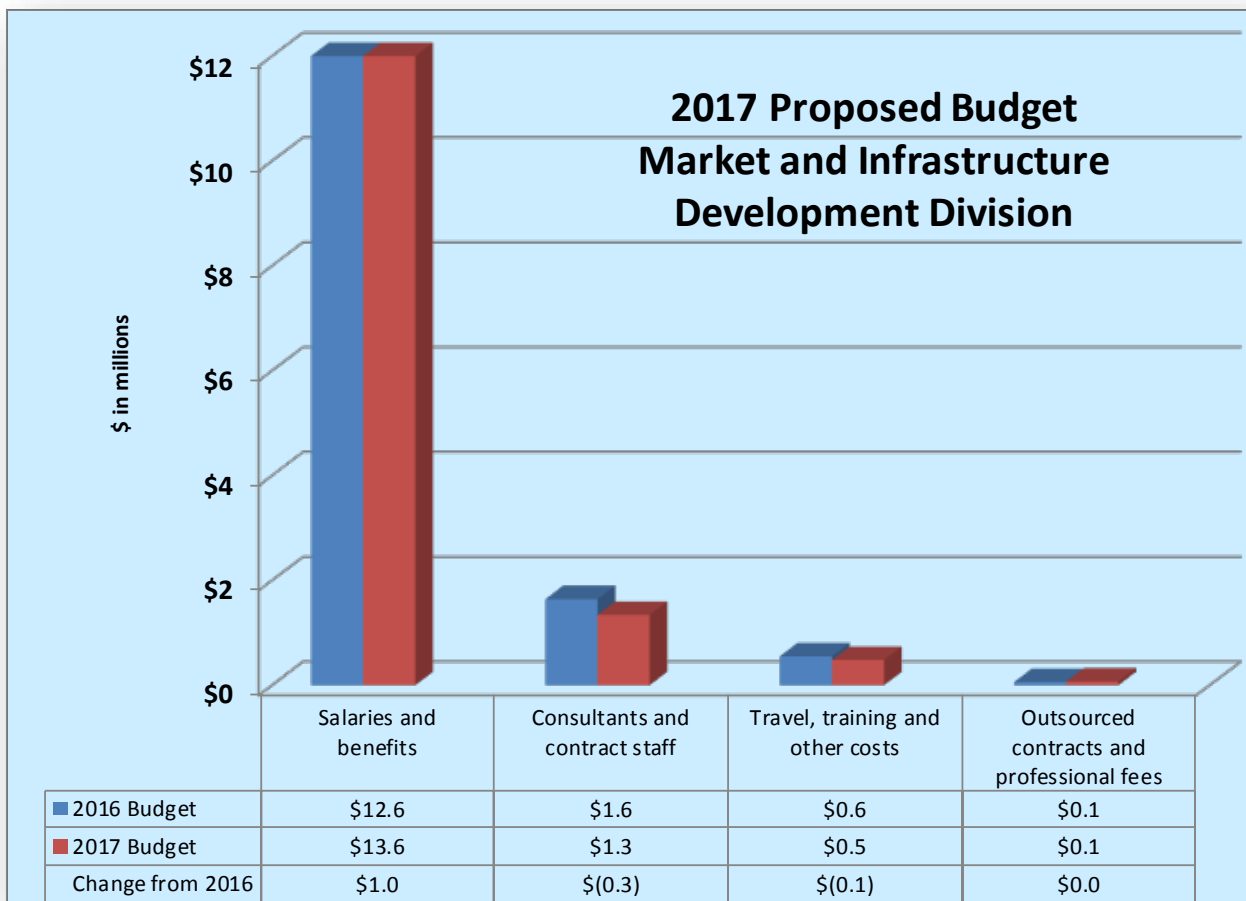
The **Market and Infrastructure Policy department** develops enhancements to ISO policies and rules that support efficient functioning of the energy and ancillary services markets and the reliable operation of the grid. The department also develops rules to facilitate a more regional market structure including refinements to the Energy Imbalance Market processes and rules that firmly establish an effective and transparent real-time market for non-ISO entities, which benefits the western U.S. interconnected grid.



The **Infrastructure Contracts and Management department** develops and manages the contracts that support the efficient functioning of ISO markets, generator interconnections and reliable grid operations to support the industry evolution driven by state and federal policies, and technological advances. In addition, the department responds to identified market inefficiencies and stakeholder issues. Ongoing duties include developing policy positions on regulatory issues and responsibility for over 2,700 ISO regulatory contracts, including their negotiation, drafting and administration.

### Discussion of Proposed Budget

The 2017 budget of \$15.5 million is \$630,000, or 4%, higher than the 2016 budget of



\$14.9 million. Staffing increased by 2 to 60 compared to 2016.

Salaries and benefit expenses increased by \$980,000 primarily due to merit increases and the additional headcount.

Consulting and contract staff costs decreased by \$260,000 primarily due to efficiencies within the transmission competitive solicitation process.

Outsourced contracts and professional fees remain largely unchanged at \$70,000.

Travel, training, and other costs decreased by \$120,000 to \$480,000 primarily due to the corporate initiative to identify savings relating to areas such as conferences and regional meetings.

## Technology Division

The Technology division encompasses information technology (IT), power systems technology, campus operations, software quality, IT architecture, information security and program management functions. The division provides reliable, cost efficient and world-class service. The division strives to enhance system performance and implement new functionalities to support corporate goals and objectives.

The division's 2017 priorities are as follows:

- implement strategic initiatives by making appropriate process, procedure and system changes;
- make incremental technology improvements, especially for market and reliability operations;
- proactively identify and fix system problems; and
- predict and proactively strengthen system vulnerabilities.

The Technology division provides the foundation upon which the numerous changes required to integrate renewable resources and enable a transparent and robust wholesale energy market and transmission system relies. The division is also developing a scalable ISO IT infrastructure that will support an expanded day ahead market and provide grid optimization to utilities throughout the West.

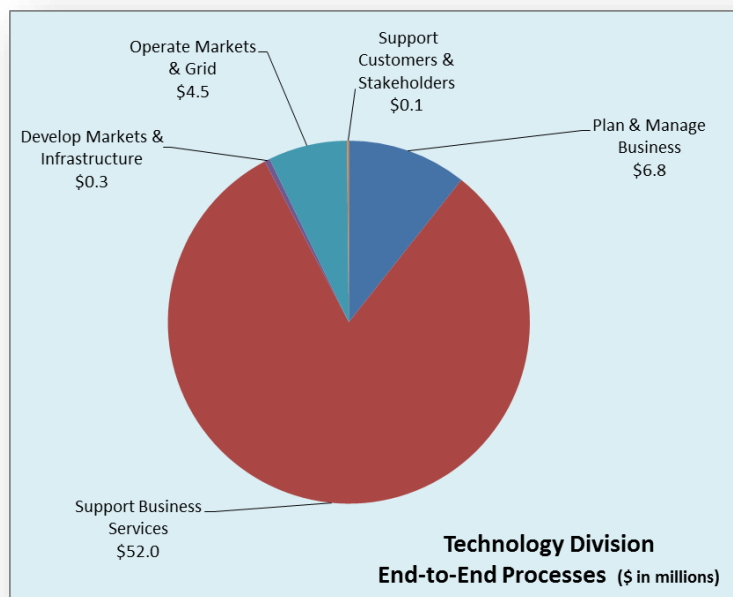
In the mid- to long-term future, the division is developing plans to make network architectural changes so that ISO systems are easier to maintain, reduce maintenance costs and leverage technologies to improve cost effectiveness.

The **Program Management Office** leads and manages key initiatives and projects that focus on enhancing customer service and processes. Core functions include release planning, program management, business and system analysis for the Strategic Plan and the market initiatives roadmap. All Program Management Office efforts have a strong process and quality focus based on Project Management Institute and Capability Maturity Model Integration standards.

The **Power Systems and Smart Grid Technology Development department** identifies emerging technologies even while it finds better ways to use mature technologies that enhance grid efficiencies and monitoring capabilities. These technologies are critical for interconnecting and managing renewable resources output variability. It is also responsible for reviewing and approving technical requirements, software design, and testing the scheduling infrastructure business rules, integrated forward market, real-time markets, and market quality service applications.

The **Power System Technology Operations department** provides information technology support for Operations. In addition, it develops and supports critical cyber

assets and real-time systems. Key functions include product management, software design, and production support for real-time and operations applications. The department maintains high availability to all Operations needs while making sure all releases, patching, and upgrade enhancements smoothly transition to production without disrupting grid operations. In 2017, the department will focus on implementation of initiatives that include policy modifications (such as resource adequacy) and demand response programs. In addition, the department will be making enhancements to the forecasting system.



**The Infrastructure Engineering and Network Operations department** includes systems engineering and administration, database engineering and storage administration, network and data center operations as well as change, problem, and asset management.

**The Security, Architecture and Model Management and Quality department** is involved in creating tools to maintain the enterprise network model. The team provides tools, as well as tracks

and suggests controls to safeguard corporate information security. The department also oversees Critical Infrastructure Protection compliance. The department duties include executing security, performance and test automation and performing the overall software quality role. Other responsibilities include defining information technology architecture guidelines.

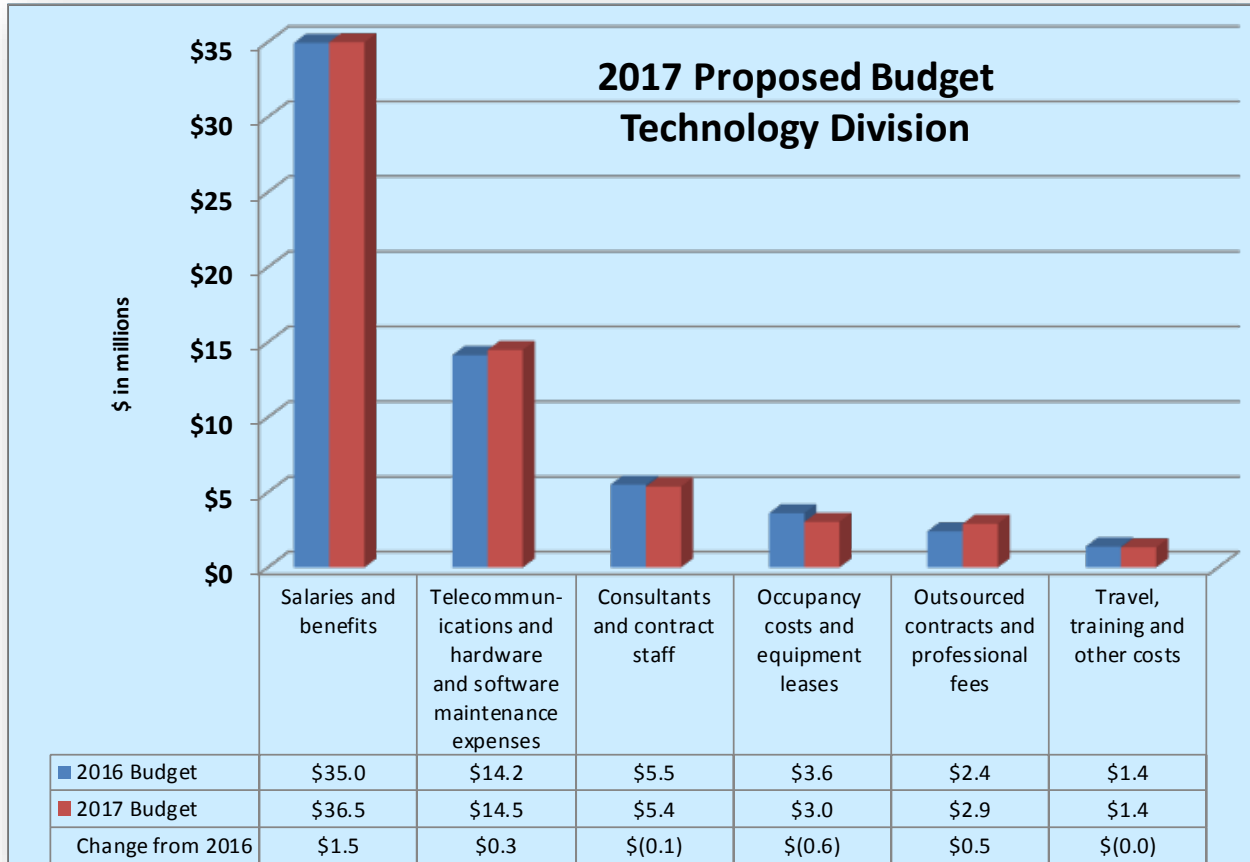
**The Business Solutions department** identifies software solutions and readies them for deployment. Key functions include product management, systems analysis, software development, functional and regression testing, customer relationship management, vendor management, production support for operations, and corporate and enterprise applications. This work includes developing software applications that support every ISO division, all enterprise applications and most applications that interact with external customers. The scope does not include those applications provided by the Power System department. In 2017, Business Solutions will contribute to most of the efforts on the ISO capital project list as well as keeping the business running.

**The IT Enterprise Support and Campus Operations department** manages the service desk, desk side support of client systems, and support of all Windows servers. The group also manages company buildings and infrastructure to support a safe, efficient and comfortable work environment. Campus Operations keeps costs down by developing best practices and maintains the ISO's 277,000 square foot Folsom building

that sits on 27 acres, as well as the backup facility. The team is responsible for physical security at both of the ISO's campuses.

### Discussion of Proposed Budget

The 2017 budget of \$63.7 million is an increase of \$1.6 million, or 3%, over the 2016 budget of \$62.1 million. Staffing increased by 1 to 191 compared to 2016.



Salaries and benefit expenses increased \$1.5 million, which is primarily due to merit increases and the additional headcount.

Occupancy costs and equipment leases decreased by \$610,000 to \$3.0 million in 2017 from \$3.6 million in 2016 primarily due to the move to the LOC and vacating the leased Alhambra backup facility.

Telecommunication costs decreased \$4.9 million in 2017 from \$5.1 million in 2016. The reduction is due to improved contracted telecommunications rates as well as continued management of wired line and mobility services. The telecommunication savings are offset by an increase in hardware and software maintenance costs in which the budget went from \$9.0 million in 2016 to \$9.6 million in 2017. The ISO strives to control hardware and software maintenance growth and make improvements where available, however it is not immune to the technology industry's rate increases.



Consulting and contract staff costs decreased \$120,000 to \$5.4 million in 2017 from \$5.5 million in 2016.

Outsourced contracts and professional fees increased \$510,000 to \$2.9 million in 2017 primarily due to increased Software as a Service (SaaS) technology.

Travel, training, and other costs remained at \$1.4 million.

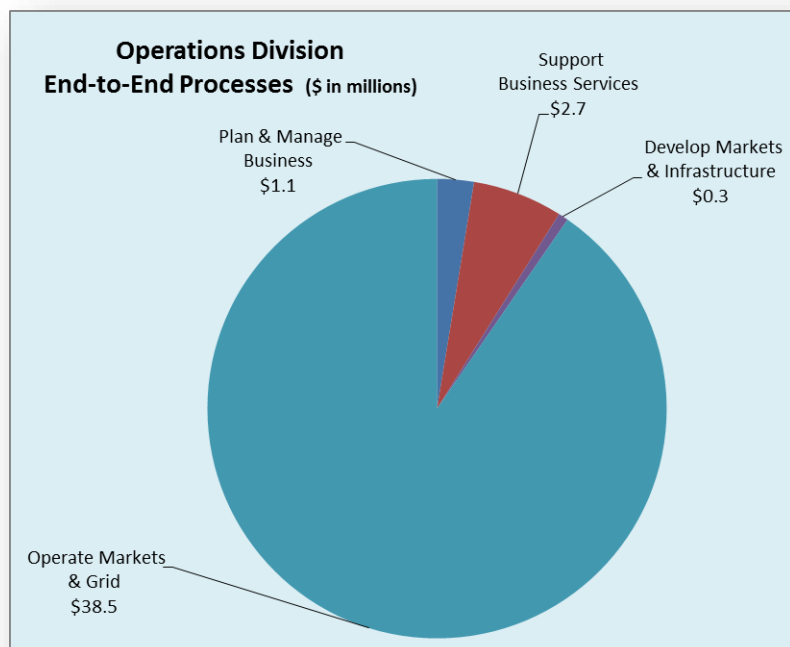
## Operations Division

The Operations division's mission is operating the bulk electric system and energy markets with a high degree of reliability. It is comprised of System Operations, Operations Engineering Services, Regional Operations Initiatives, Market Services Support, and Market Services Production departments.

The division's operating engineers use advanced tools to proactively manage the grid system characteristics and generation fleet changes, which includes variable renewable resources. The ISO control center uses geospatial technology and advanced visualization capabilities, which provides system operators with a granular view of grid conditions and the capability to identify potential problems and solve them in advance of real time. The Systems Operations department operates the Integrated Forward Market and the real-time market to deliver the most cost effective energy to consumers in California and the West while maintaining grid reliability.

The professionals comprising the Systems Operations and Operations Engineering Services departments are highly skilled in using the advanced technologies and tools necessary to reliably operate the grid and facilitate efficient markets in complex environments while evolving the grid to meet policy goals.

The **System Operations department** comprises the Real-Time Operations and the Operational Readiness groups. The Real-Time Operations group is composed of, interchange, transmission generation, and market system operators who manage the scheduled production of energy and its delivery, as well as having the



authority to take steps to reposition the fleet and optimize transmission lines to maintain reliability.

The Operational Readiness group implements the operational aspects of policy initiatives, ISO operational goals and provides system operators with the tools and training necessary to reliably manage the bulk electric system. The department functions include maintaining a training simulator program, implementing operations change initiatives, operating procedure maintenance and designing systematic approaches to training development and administration, and cultivating a strategic information development program.

The **Operations Engineering Services department** directly supports System Operations with engineering and technical planning services. This includes performing annual and monthly resource adequacy validation and replacement requirement analysis, seasonal assessments, outage management and coordination analysis, day-ahead and real-time engineering analysis. The department also provides input in developing operating procedures and tools that support the department.

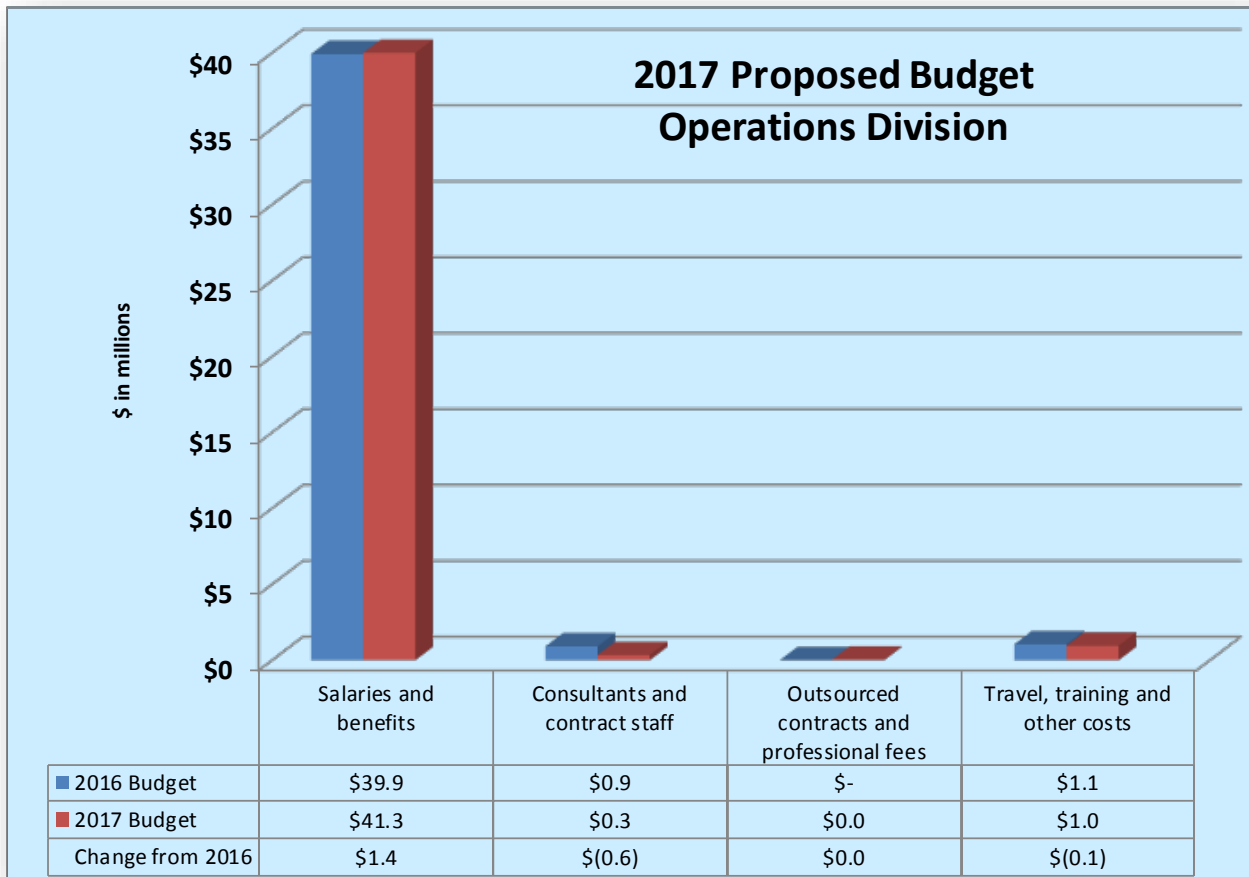
The **Regional Operations Initiatives department** works with state, regional and national entities to balance policy direction with operational capabilities. This department is also the ISO liaison for coordinating gas and electric policies with state agencies and stakeholders, and represents the West in national forums on related gas and electric market issues.

The **Market Services Support department** counts among its most important responsibilities the implementation of market software and technology enhancements that produce transparent, consistent and efficient operations and settlements. It also assures the accuracy of revenue metering and is responsible for the resolution of settlement disputes. The Market Settlement Quality and Control group manages the Rules of Conduct program, which includes providing oversight of certain market participant behaviors.

The **Market Services Production department** works with new ISO participants to seamlessly shepherd their projects into the ISO network and market models, all the while supporting existing participants in revising parameters for all related resources used in the markets. This is accomplished by direct coordination of required resource information between the ISO participants and internal supporting departments, allowing defined weekly model scoping, verified accuracy of real-time telemetry and revenue metering, and coordinated resource interconnections. It is also responsible for communicating with the ISO participants to produce daily settlement statements meeting the tariff defined settlement timeline. This task is accomplished through daily system processing, data validations, corrections updating, and maintaining the weekly billing invoice publication cycle.

## **Discussion of Proposed Budget**

The 2017 budget of \$42.6 million increased by \$700,000, or 2%, from the 2016 budget of \$41.9 million while staffing increased by 4 to 200 compared to 2016.



Salaries and benefit costs increased \$1.4 million to \$41.3 million primarily due to merit increases.

Consulting and contract staff costs decreased by \$620,000 in 2017 primarily due to reduced need for external resources.

Outsourced contracts and professional fees remain largely unchanged at \$40,000.

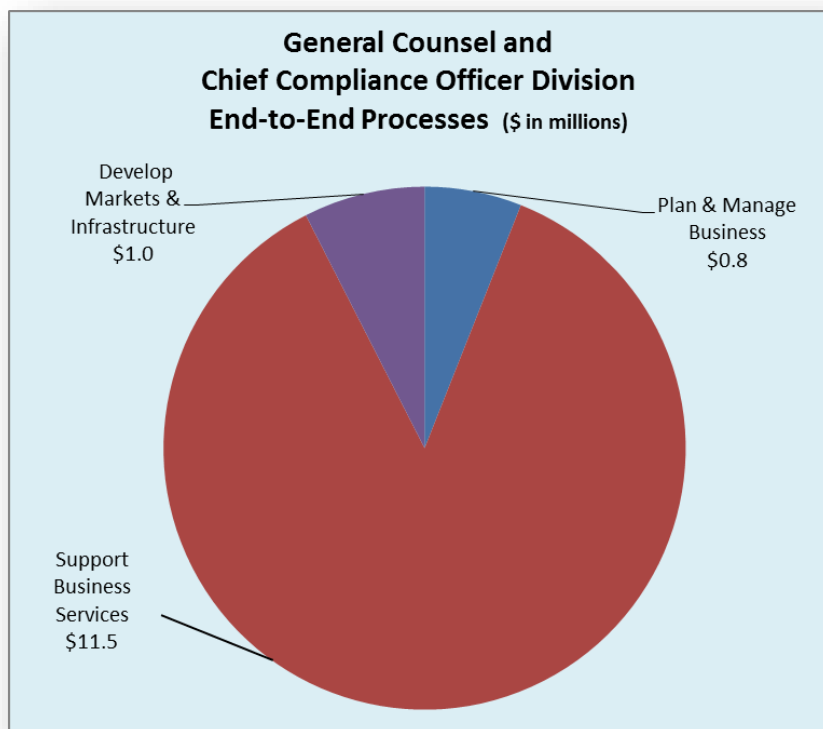
Transportation, training and other costs decreased by \$120,000 in 2017 primarily related the move to the LOC and vacating the leased Alhambra backup facility.

## General Counsel Division

The General Counsel division is led by the Vice President, General Counsel, Chief Compliance Officer and Corporate Secretary. The division is comprised of the legal department, corporate compliance and corporate affairs, internal audit, and the corporate secretary functions.

The division provides high quality legal counsel to the Board, the CEO, the executive team, and all business units. It represents the organization in regulatory and legal

proceedings to protect the ISO's interests, and to help ensure that the company can meet its objectives. The division oversees the compliance function and provides reasonable assurance to executive management and the Board that there are effective and efficient policies and procedures in place, well understood and respected by all employees, and that the company is maintaining compliance with the tariff and other legal and regulatory requirements governing the ISO.



The **Deputy General Counsel – Regulatory department** oversees all legal and regulatory functions, and advises on and provides support for all regulatory matters throughout the company. This group also includes Federal Regulatory Affairs, which is responsible for managing regulatory relationships with the Federal Energy Regulatory Commission and other federal agencies as needed. The

department also provides advice and counsel on federal regulatory issues and works with internal business units to obtain regulatory approval of initiatives.

The **Assistant General Counsel – Regulatory department** oversees legal and regulatory functions, including tariff amendments, state and federal regulatory matters, and regulatory litigation. The attorneys in this area work closely with policy development teams to create market, transmission and operations services, and energy products and features that conform to existing tariffs. The attorneys also work in parallel with other legal and business units as well as stakeholders to draft and file tariff additions and modifications.

The **Assistant General Counsel – Tariff** department is primarily responsible for all tariff-related activities including stakeholder processes, drafting tariff amendments, tariff maintenance and interpretations, and advising on tariff compliance assessments and investigations and related regulatory proceedings. The attorneys in this area are also responsible for all generator interconnection related work and regulatory contracts and schedules.

The **Assistant General Counsel – Legal department** oversees state and federal court litigation, appellate work, dispute resolution and other adversarial proceedings. It also

advises the corporate compliance team regarding mandatory standards, investigations and regulatory audits. The attorneys in this area also advise the company on vendor contracts, intellectual property, finance, tax, corporate governance, ethics, and human resources issues.

The **Paralegal and Office Administration department** provides paralegal, administrative and technical assistance to the legal department and assists in supporting the Human Resources department on immigration matters.

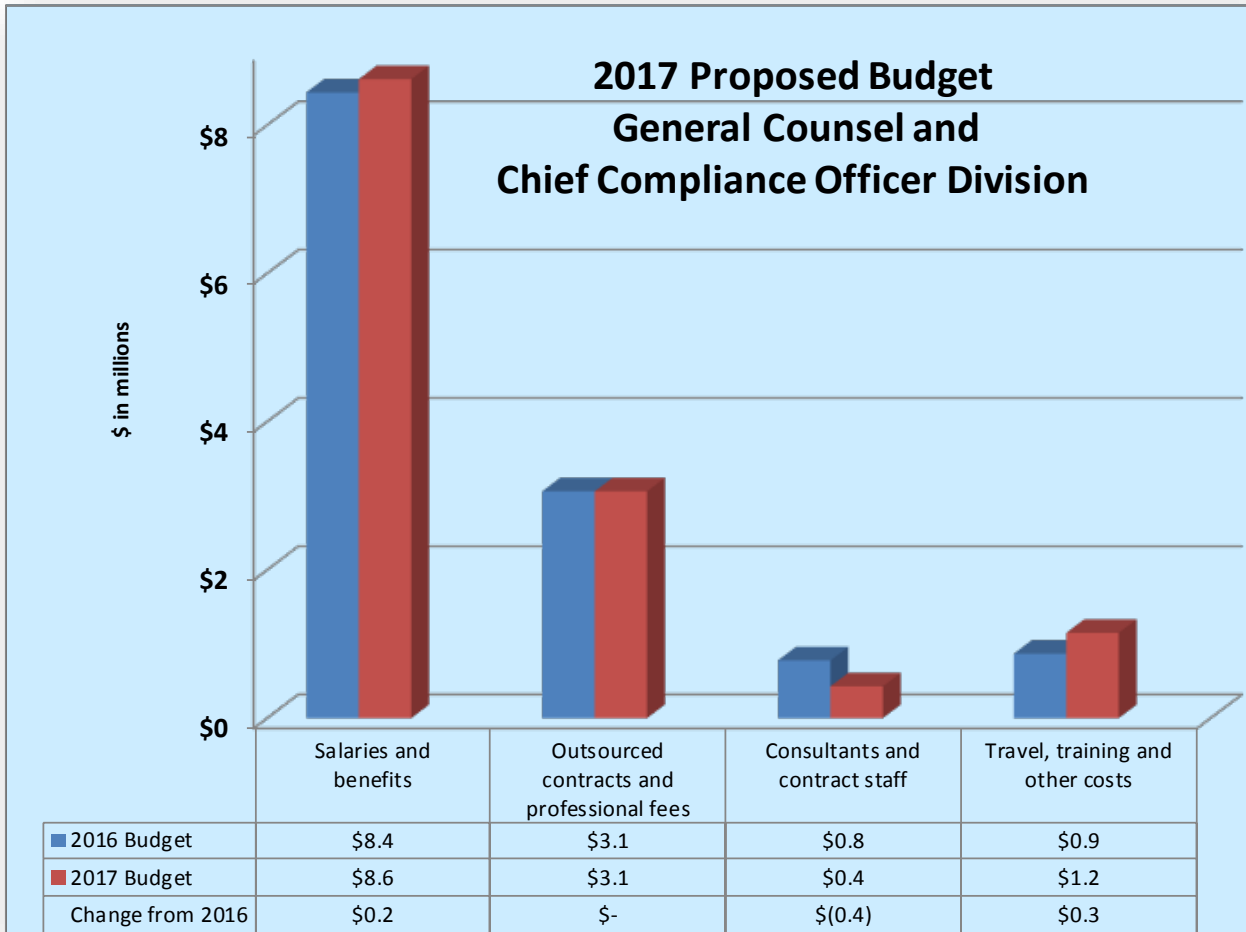
The **Corporate Compliance department** promotes a corporate culture of compliance in support of all laws, regulations and corporate policies. The department assesses and ensures business units implement new and revised reliability standards and tariff requirements by documenting and monitoring processes, procedures and tools used to validate compliance. It collaborates with business units to test the effectiveness of internal controls to minimize the risk of non-compliance. It is also responsible for developing and implementing the corporate records management program in support of compliance with legal and regulatory recordkeeping requirements. In addition, corporate compliance is responsible for a number of corporate governance responsibilities, including Strategic Plan development and deployment of corporate annual and long-term goals and metrics, as well as coordinating meetings and activities of the western Energy Imbalance Market Governing Body.

The **Internal Audit department** is responsible for developing and implementing the annual internal audit plan and conducting audits to evaluate the effectiveness of management practices and controls. It provides the executive leadership team and the ISO Board Audit Committee with reasonable assurance that processes and controls are functioning as intended and risks are well managed. The department is also responsible for facilitating the ISO enterprise risk activities, including providing briefings to management and the Board of Governors on enterprise risks, risk response and status of mitigation plans. Internal Audit also serves as a business advisor to ISO personnel, engaging in a number of advisory activities to add value and help promote the ISO's culture of compliance and ethics.

The **Assistant Corporate Secretary** coordinates Board related matters that include all Board of Governor meetings and materials, all Board committee meetings and materials (including those for the Market Surveillance Committee), as well as other Board communications. This department is also responsible for maintaining the official corporate record and overseeing Board compensation.

### **Discussion of Proposed Budget**

The 2017 budget of \$13.3 million increased by \$120,000, or 1%, from the 2016 budget of \$13.2 million. Staffing remains at 32 for 2017.



Salaries and benefit costs increased by \$170,000 to \$8.6 million in 2017 primarily due to merit increases.

Consultants and contract staff decreased to \$440,000 primarily due to a reduced need for external resources coupled with internal resource changes in the information governance area.

Professional fees remains unchanged at \$3.1 million in 2017 primarily due to the General Counsel and Chief Compliance Officer's long-term goal to stabilize and reduce the use of outside legal services where possible.

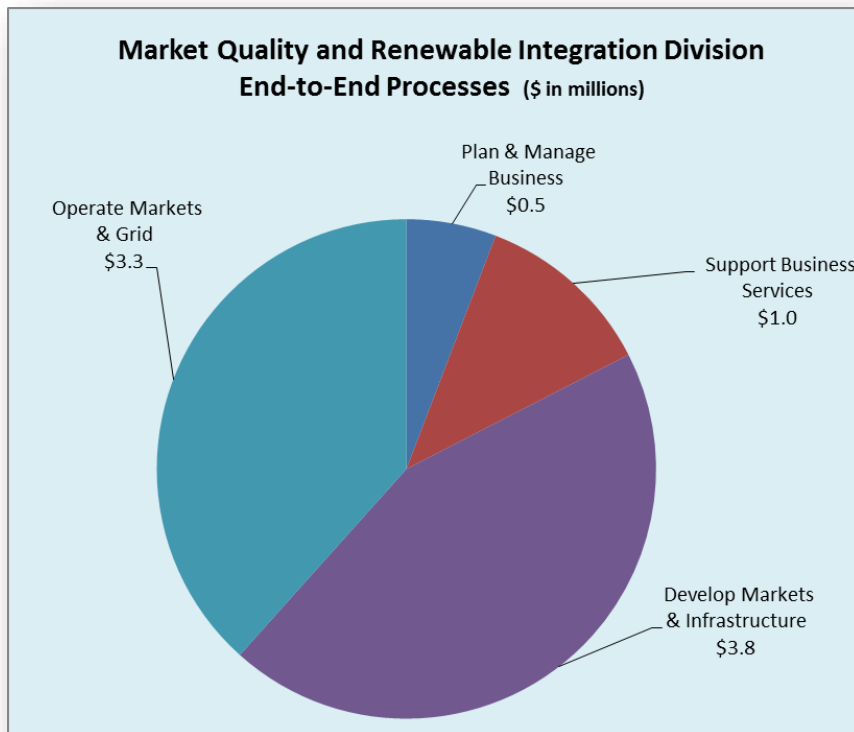
Travel, training and other costs increased by \$270,000 primarily due to EIM and further regional initiatives.

## Market Quality and Renewable Integration Division

The Market Quality and Renewable Integration division tracks and reports market performance metrics, and performs price analysis and validation that enhances

transparency and confidence in market results. The division performs short-term load, wind and solar forecasting and is responsible for performing system flexibility assessments in support of integrating renewable resources. The division also performs assessments and quantifies benefits related to the western Energy Imbalance Market.

Along with performing and reporting in-depth market analysis, the division uses advanced short-term demand and supply forecasting technologies to ensure grid needs are being met through the competitive wholesale energy market. The division is responsible for conducting generation fleet studies that test whether adequate “flexible capacity” is installed to meet future electricity growth. The division focus for 2017 is to enhance the consistency of modeled conditions between the day-ahead and real-time market, which increases market efficiency.



**The Market Development and Analysis**

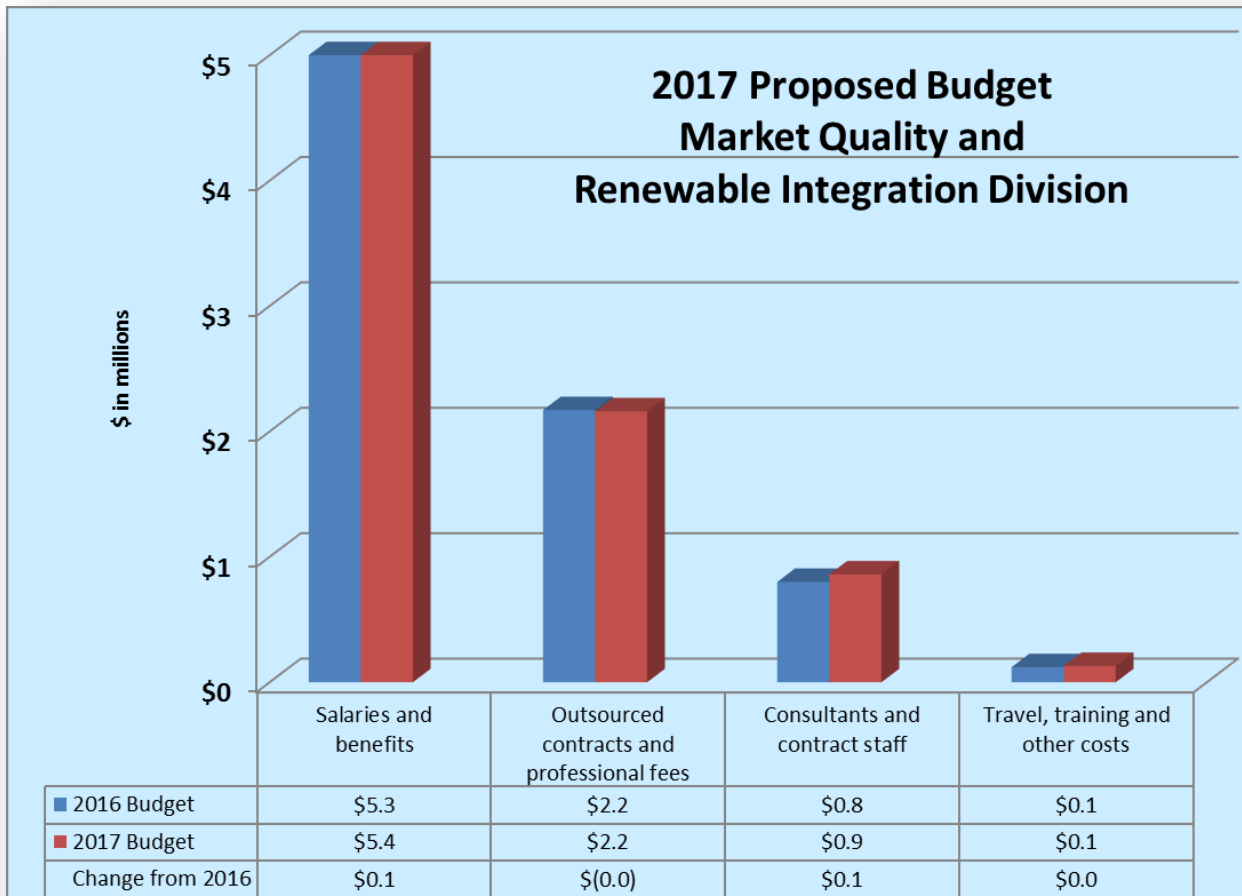
**department** monitors the market, identifies systemic issues, and ultimately develops solutions to rectify the issues. The department is also responsible for supporting policy development and implementing new market designs. Additionally, the department co-hosts the Market Performance and Planning Forum web conference, which provides updates and

observations on current market performance with an emphasis on coordinating plans with stakeholders to implement market enhancements, services and features. Outreach is an important ISO effort to improve its communications with stakeholders and encourage feedback.

The **Market Validation and Quality Analysis department** monitors, analyzes and validates the quality of daily market results. The department is also responsible for price corrections as well as identifying and addressing root causes of erroneous prices and other market quality issues.

The **Short Term Forecasting department** produces accurate short-term forecasts for load and variable energy resources such as wind and solar generation.

## Discussion of Proposed Budget



The 2017 budget of \$8.6 million increased by \$200,000, or 2%, from the 2016 budget of \$8.4 million. Staffing remains at 24 in 2017.

Personnel costs increased in 2017 to \$5.4 million primarily due to merit increases.

Consultants and contract staff increased in 2017 to \$860,000 primarily due to additional short-term regional integration and coordination initiatives.

Outsourced contracts and professional fees remained the same in 2017 at \$2.2 million.

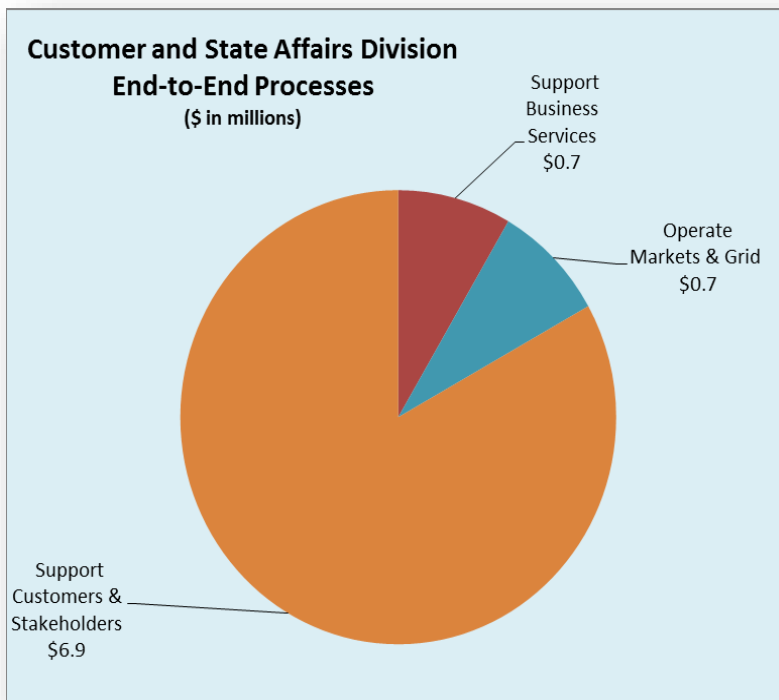
Travel, training and other costs remained the same in 2017 as well.

## Customer and State Affairs Division

This division was created in 2016 when the former Policy and Client Services division, was split into two separate organizations, Customer and State Affairs and Regional and Federal Affairs.



The Customer and State Affairs division builds collaborative relationships with regulators, state officials, environmental and consumer groups, as well as industry stakeholders. By providing timely and accurate information, the division strives to foster superior customer service. To fulfill its mission, the division works closely with other ISO business units to proactively resolve wholesale market customer issues or promptly address issues as they arise. In addition, maintaining open and robust communications with customers, regulators and other stakeholders is one of the division's highest priorities. This includes creating fact sheets, corporate brochures and infographics that transform highly technical engineering and market design terms and concepts into language that non-technical audiences can understand and use. Among other duties, the division coordinates and consults with state agencies and the governor's office to help shape and enhance environmental and grid reliability policies.



The **Communications and Public Relations department** oversees internal and external communication activities that include producing printed, digital, social media and video materials. The department is responsible for all web communications and website management, as well as employee communications and media relations. The department also issues stakeholder communications and develops new information products and services that add

value to customer and stakeholder participation in the ISO grid and energy markets.

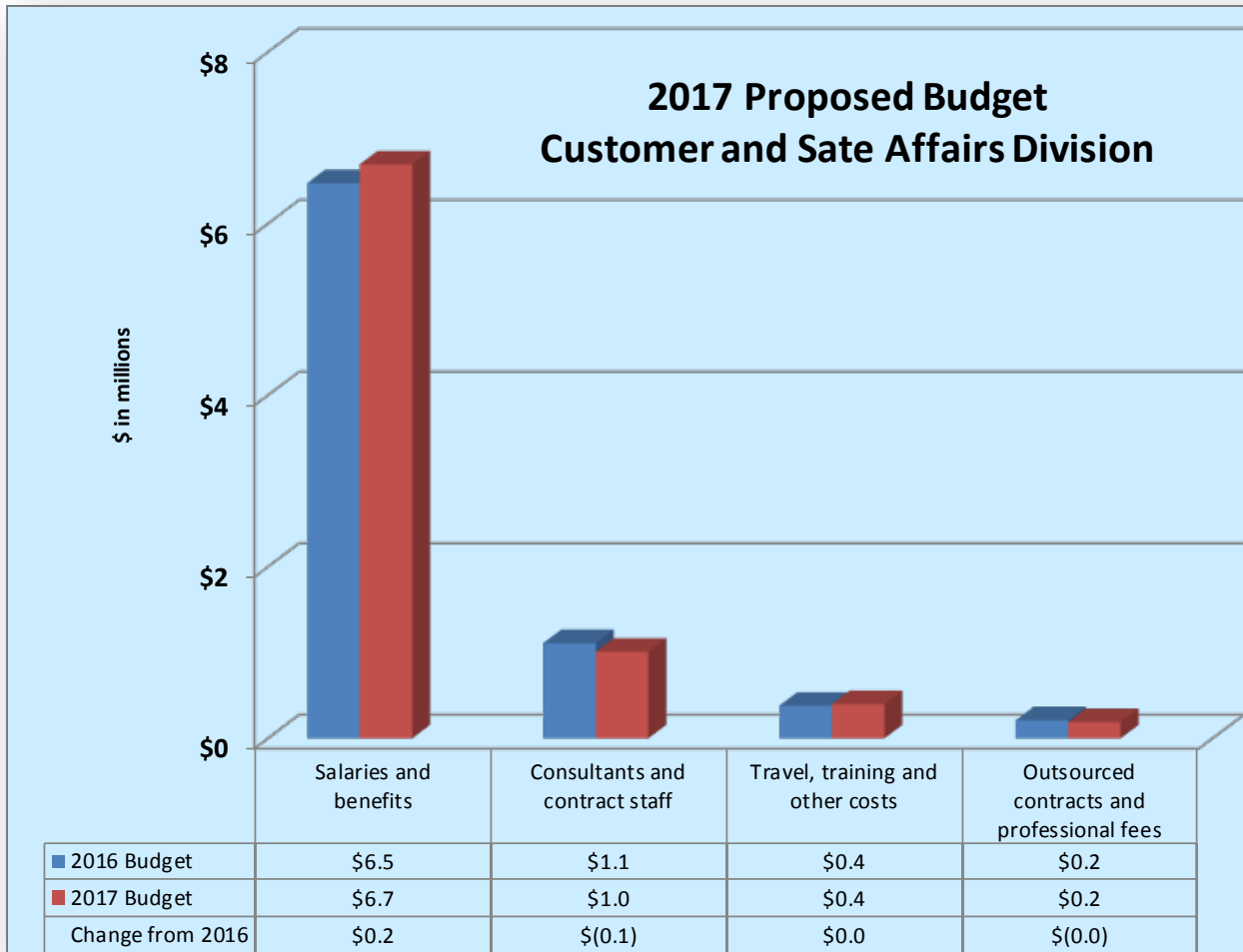
The **Customer Service and Industry Affairs department** is the primary business contact between the ISO and its clients and stakeholders. The department offers a program to provide technical support to new participants and advanced systems training. Web-based resources, links to trade associations, and staff support to resolve newcomer issues is making it easier and seamless for entities to navigate and realize the full benefits of participating in the ISO markets.

The **State Affairs department** interacts with state lawmakers, the governor's office and interested associations and organizations on matters that could affect the reliability or economics of the ISO grid and energy markets.

The **State Regulatory Affairs department** builds and maintains relationships with regulatory agencies such as the California Public Utilities Commission, the California Energy Commission, and the California Air Resources Board, as well as monitors and manages regulatory matters that could influence ISO practices and policies.

### Discussion of Proposed Budget

The 2017 budget of \$8.3 million reflects a \$120,000, or 1%, increase over the 2016 budget of \$8.2 million. Staffing remains unchanged at 34.



Salaries and benefit costs increased \$220,000, primarily due to merit increases.

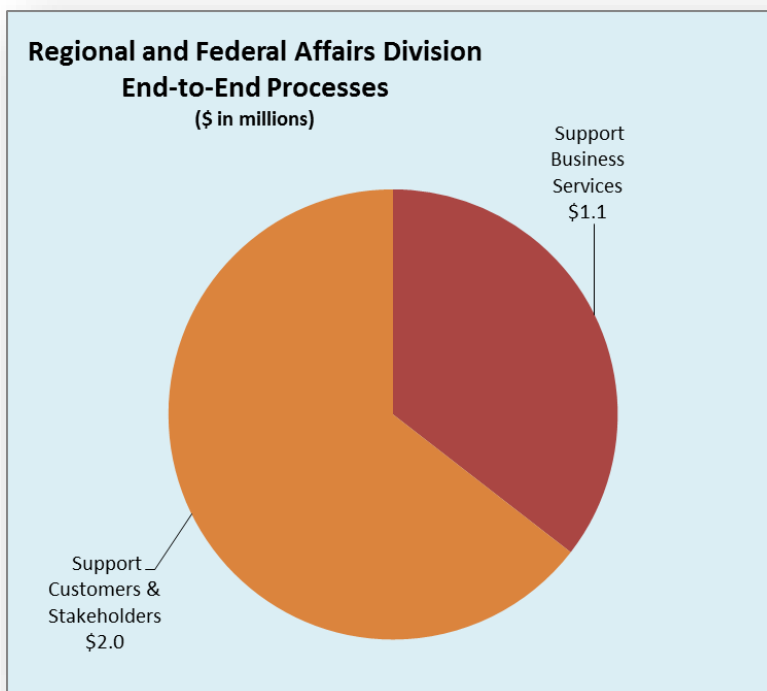
Consultants and contract staff decreased to \$1.0 million in 2017 due to reduced need for external resources.

The budget for the other resource categories remain the same in 2017.

## Regional and Federal Affairs Division

This newly created division is leading the regional coordination efforts for the California ISO. It works to engage a diverse set of stakeholders, regulators, consumer groups and elected officials on topics related to governance and strategies that will support a west-wide ISO market. The division helps coordinate open and transparent public meetings during which sophisticated engineering and power market analysis is presented. The team presents the analysis in an easy to understand format that can be used by decision makers in their deliberations regarding the ISO full service market expansion as well as to gain support by the public at large.

In addition, the division actively works with utilities seeking to participate in the ISO's western Energy Imbalance Market (EIM). This real-time market finds the lowest cost energy needed to serve consumers regardless of location. This reduces the need to run power plants that are more expensive as well as share excess renewable energy produced in one area across a wide geographic region instead of having to shutdown wind and solar power plants in order to maintain grid reliability. This division provides policy support for the newly established EIM Governing Body and the Regional Issues Forum, which provide a regional voice on matters related to EIM. This includes education and support to regional stakeholders, policy makers, and regulators. This division personifies the significant paradigm shift in how the power market operates in the region and how consumers ultimately benefit from lower costs, a more reliable grid, and a cleaner environment from improved regional coordination.



The **Strategic Alliances department** promotes regional coordination and cooperation across the West, which includes expanding the real-time western Energy Imbalance Market, which can reduce energy production and delivery costs for participants by more efficiently using a large pool of generation resources to serve demand. Western entities are at a crossroads and face new needs caused by renewable development and various initiatives

promoting regional transmission planning. This department leads activities aimed at meeting these needs while maintaining and increasing value to all affected parties, which includes existing entities served by the ISO. Strategic Alliances lends assistance

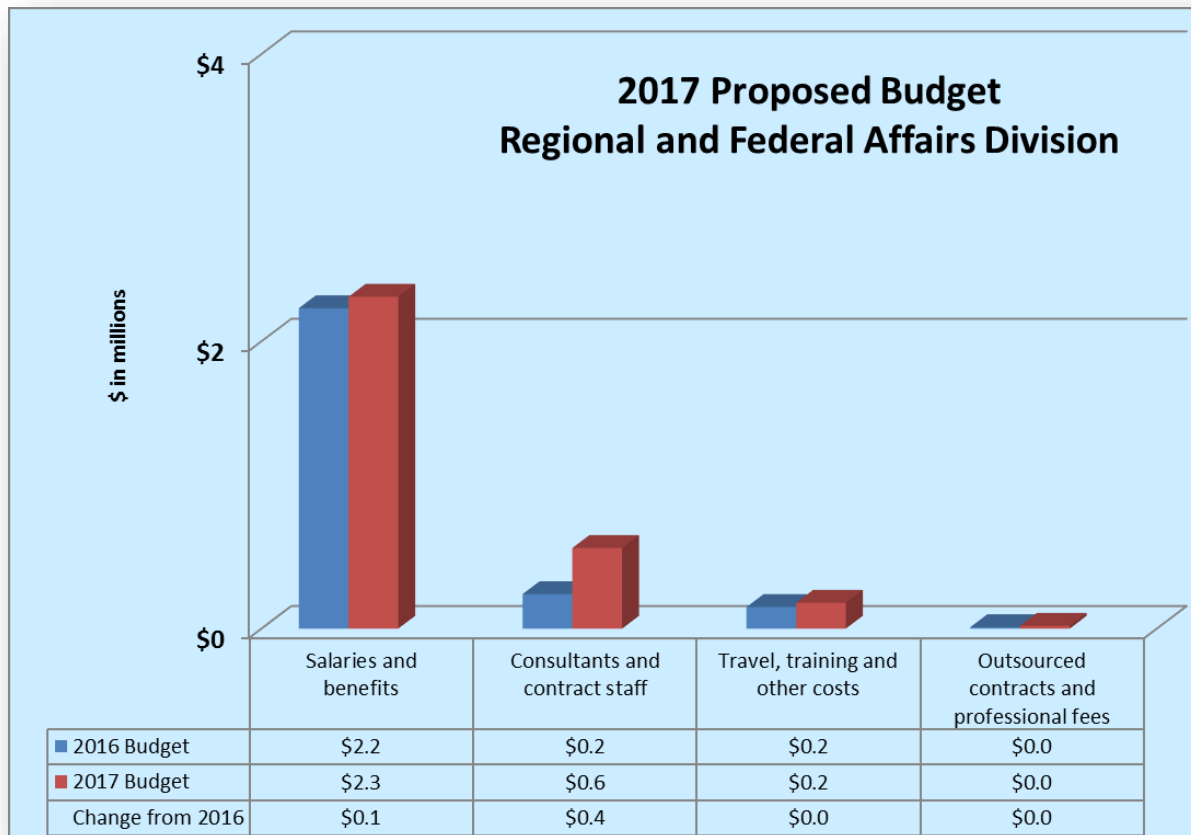
to entities seeking various forms of participation with the ISO. EIM began serving participating utilities in the West in the fall 2014 and now covers parts of eight western states and has produced over a hundred million dollars in benefits.

The **Regional Integration department** provides management and expert staff to a new effort that supports transmission owners' interest in or seeking entry as a full ISO participating member. This department acts as the primary liaison between new participants and internal ISO business units to facilitate smooth market entries, which includes making any needed changes to the ISO tariff and procedures. The department works closely with ISO executives and management to develop strategies for successfully integrating new business partners, and serves as an external interface, which provides the principal expertise to support engagements between the ISO and policymakers of integration partners.

The **Federal Affairs department** monitors and manages federal legislative and regulatory matters that could influence ISO practices and policies. It works with members of Congress, federal agency personnel and allied stakeholders to advise and educate lawmakers on policies that could affect the power system.

## Discussion of Proposed Budget

The 2017 budget of \$3.1 million reflects an increase of \$460,000, or 20%, over the 2016 budget of \$2.6 million. Staffing remains unchanged at eight.



Salaries and benefit costs increased \$80,000, primarily due to merit increases.

Consultants and contract staff increased in 2017 to \$550,000 primarily due to additional short-term regional integration and coordination initiatives.

The budget for the other resource categories remain the same in 2017.

## VI. DEBT SERVICE

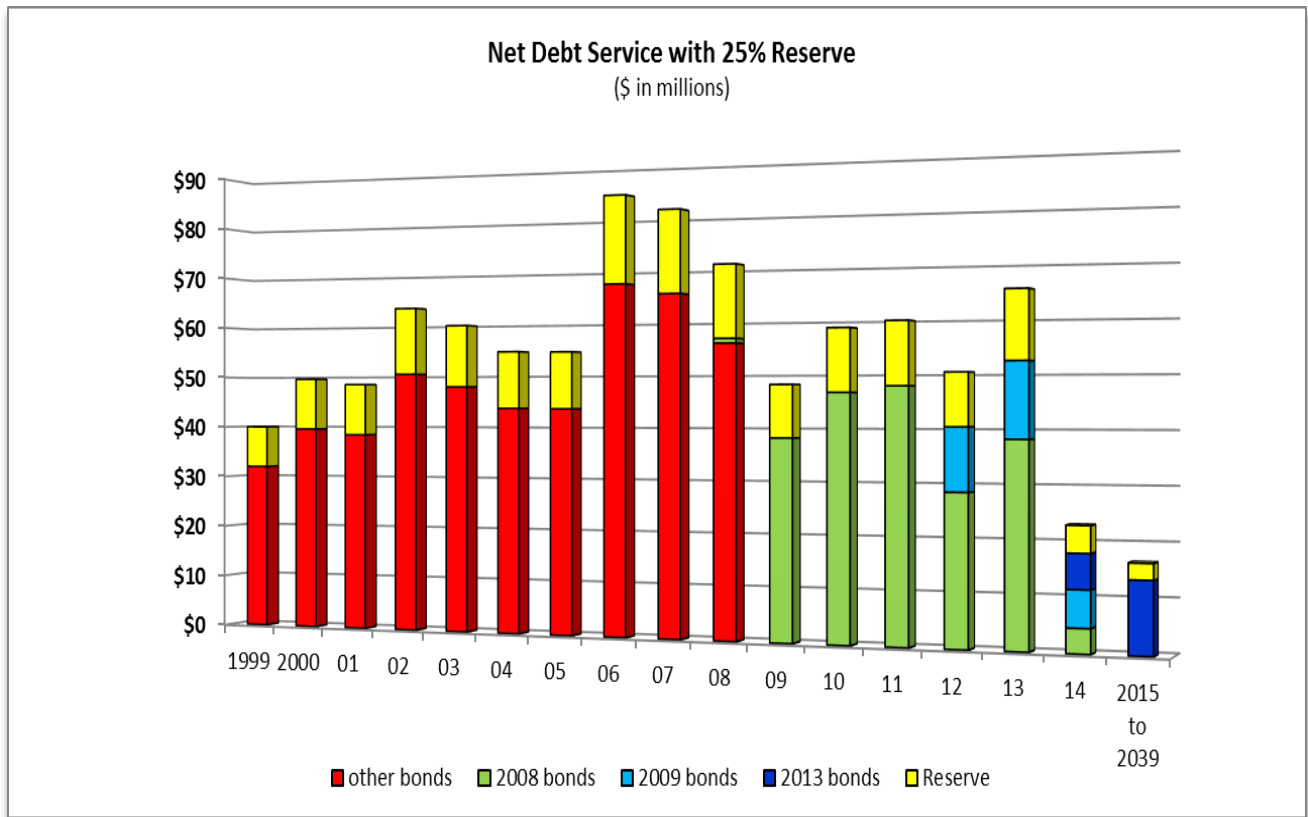
The debt service amount included in the 2017 revenue requirement remains unchanged from the 2016 amount. At \$16.9 million, the amount includes the principal and interest payments due on the Series 2013 bonds and the 25% debt service reserve. The total equals the sum of the semiannual interest payment due in August of the budget year, the principal and semiannual interest payment due in February of the ensuing year and the 25% debt service reserve amount required by the tariff. A summary of the debt service components for 2017 and 2016 included in the revenue requirement is as follows.

Debt Service (\$ in millions)	2017 Budget	2016 Budget	Change
Principal payments	\$4.6	\$4.5	\$ 0.1
Interest payments	8.9	9.0	(0.1)
<b>Subtotal</b>	<b>13.5</b>	<b>13.5</b>	<b>-</b>
25 % Debt Service Reserve	3.4	3.4	-
<b>Total</b>	<b>\$16.9</b>	<b>\$16.9</b>	<b>\$ -</b>

The Series 2013 bonds were issued in November 2013 to refinance the 2009 bonds. The refinancing resulted in approximately \$1.25 million in lower annual debt service payments and over \$30 million in total savings. The 2009 bonds had been issued to finance the ISO's new headquarters facility in Folsom, California and to fund other capital expenditures. Below is the future amortization schedule for the 2013 bonds.

Amortization Schedule for 2013 Bonds (\$ in millions)	Principal	Interest	Total
2017	\$4.6	\$8.9	\$13.5
2018	4.8	8.7	13.5
2019	5.0	8.5	13.5
2020	5.2	8.2	13.4
2021-2039	163.4	89.5	252.9
<b>Total</b>	<b>\$183.0</b>	<b>\$123.8</b>	<b>\$306.8</b>

The chart below shows the net debt service of the ISO from inception.



## **VII. CAPITAL / PROJECT BUDGET AND CASH-FUNDED CAPITAL**

The proposed 2017 capital and project budget of \$20 million will fund projects as detailed on the following pages. The Board approves the capital and project budget separately, along with the revenue requirement. The Corporate Management Committee (CMC), made up of the Chief Executive Officer, Chief Financial Officer and General Counsel and Chief Compliance Officer, authorizes individual projects within the approved budget throughout the year. The Board must also approve any increases in the approved budget.

Future annual capital project budgets are estimated to be in the range of \$18 million to \$20 million per year and are funded primarily through the cash-funded capital component of the revenue requirement and its related reserves. The cash-funded capital collected via the 2017 revenue requirement is proposed to be \$24 million with the excess, after utilization of the remaining bond proceeds, used to fund future projects. The funds set aside for future projects will enable the ISO to maintain a stable revenue requirement for an extended period.

### **Supplemental Board Approved Projects**

In addition to the annual capital project budget process above, the Board approved the following supplemental capital projects outside of the annual capital budget limitations:

- 1) In June 2015, the Board approved the construction of a new back-up control center in Lincoln, California (Lincoln Operations Center or LOC). The new facility replaces the back-up center in Alhambra, California. The LOC became operational during the fourth quarter 2016. The approved budget of \$30.4 million was funded entirely from capital reserves on-hand; no additional debt financing was required.
- 2) In January 2016, the Board approved the Energy Management System (EMS) Replacement project. The project addresses the need for the EMS to be robust and scalable to meet the expected load. The projected completion of this project is late 2017.
- 3) The Board has approved several EIM implementation agreements with new entities, two of which will be progressing in 2017, i.e., Portland General Electric Company and Idaho Power Company. As outlined in the agreements, the prospective EIM entities reimburses the ISO for costs incurred around the implementation. Since funding comes from the entity, these projects are handled outside of the annual capital project budget.



## Capital / Project Budget Development Process

The 2017 project prioritization process runs from July 2016 through November 2016. The Program Management Office collaborates with the internal business units and maintains a list of projects throughout the year. The list aligns with the corporate Strategic Plan, 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.

During the budgeting process, the list is updated to match strategic projects scheduled for the following year, which results in an initial master list. The CMC prioritizes and ranks projects when the list exceeds the available budget. The following chart identifies the criteria used to rank projects. The ISO website contains the full ranking criteria schedule.

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	Improve ISO customer experience	10%
Ensure continued reliability during grid transformation (capacity on the system)	Evolve the market Markets and performance (MAP) Develop infrastructure and tools	10%
Explore opportunities for regional collaboration and technological innovation	Incorporate renewable resources Improve forecasting capabilities MAP	10%
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%

The business and financial case criteria follows:

- Does the project require market participant development efforts?
- 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 projects proposed for initiation during 2017. 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

Before receiving funding approval, all projects on the proposed list will be evaluated to consider project need, cost-benefit analysis and project plan review. Specifically, the CMC reviews and approves all projects considered for funding. The 2017 priorities may change depending on developments during the remainder of 2016. The actual projects completed during 2017 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.

Proposed Projects for 2017	Amount
<b>Market and Operational Excellence</b>	
Congestion revenue rights (CRR) application upgrade	Large
Operations and market systems enhancements 2017	Large
Program office internal labor	Large
Reliability Services Phase 1b and phase 2	Large
Commitment cost enhancements phase 3	Medium
Energy imbalance market (EIM) enhancements 2017	Medium
Operations training environment improvements	Medium
Bidding rules enhancements part B	Small
Contingency modeling enhancements - transmission	Small
Expand non-generator resources (NGR) with proxy demand response (PDR) and distributed energy resources (DER) options	Small
Greenhouse gas enhancement (secondary market)	Small
Initialization funding for capital projects	Small
Integration of systems with new energy management system (EMS)	Small
Load forecasting improvements	Small
Market application execution performance improvements -Day-ahead and Real-time markets	Small
Market quality system (MQS) redesign	Small
Outage optimization phase 2	Small
Phase shifter modeling in market application (Energy management network application - EMNA)	Small
Reducing time gap between real time pre dispatch (RTPD) running time and binding interval	Small

<b>Proposed Projects for 2017</b>	<b>Amount</b>
Robust study state estimator (SE) and real time contingency analysis (RTCA) availability	Small
<b>Total</b>	<b>\$12,200,000</b>
<b>Enhance the Technology Foundation</b>	
Miscellaneous hardware & software purchases	Large
Multi-active operations	Medium
Technology system improvement for production 2017	Medium
Automated dispatch system (ADS) architectural alignment	Small
Applicable reliability criteria (ARC) phase 3 / user interface (UI) & reports redesign	Small
Control room phone system purchase	Small
Customer ISO market results interface (CMRI) improvements	Small
EIA-930data requests	Small
Open access same-time information system (OASIS) improvements	Small
RMR application validation engine (RAVE) consolidation with settlement	Small
Security improvements	Small
Resource interconnection management system (RIMS) enhancements	Small
<b>Total</b>	<b>\$5,425,000</b>
<b>Focus on Customer Service and Other Costs</b>	
Facilities replacement reserve	Medium
Campus operations annual budget	Small
Customer service improvement projects	Small
External training program development – phase 2	Small
<b>Total</b>	<b>\$1,675,000</b>
<b>Grid Evolution Readiness and Regional Innovation Opportunities</b>	
Energy imbalance market economic studies	Small
Metering rules enhancements	Small
Peak Reliability Coordinator (RC) integration modifications	Small
Technology pilots and demonstrations	Small
Wind and solar forecasting improvements	Small
<b>Total</b>	<b>\$700,000</b>
<b>Total Proposed Projects for 2017</b>	<b>\$20,000,000</b>

Note: The costs of individual projects are not identified. They are categorized by size as follows: small projects under \$500,000, medium projects from \$500,000 up to \$1 million, and large projects over \$1 million. The actual projects completed during 2017 will vary, which includes the potential addition of projects not on this list, the deferral of projects on this list to future years, or the elimination of projects on this list if no longer necessary.

## VIII. OTHER COSTS AND REVENUE

The budgeted other costs and revenue for 2017 is \$13.3 million, \$2.5 million higher than 2016 primarily due to increased fees from the EIM administrative charge. EIM administrative charges are projected to be \$4.8 million in 2017, which is an increase of \$2.3 million over 2016 due to increased participation in the market. Interest earnings are also anticipated to come in \$100,000 higher in 2017 due to more favorable short-term interest rates. All other components of this category are expected to have minimal changes.

The details of this category are as follows.

<b>Other Costs and Revenue (\$ in millions)</b>	<b>2017 Budget</b>	<b>2016 Budget</b>	<b>Change</b>
Energy Imbalance Market Administrative Charges	\$4.8	\$2.5	\$2.3
Interest Earnings	2.1	2.0	0.1
Intermittent Resource (wind and solar) Forecasting Fees	2.1	2.1	-
California-Oregon Intertie Path Operator Fees	2.0	2.0	-
Large Generation Interconnection Fees	1.9	1.8	0.1
Scheduling Coordinator Application and Other Fees	0.4	0.4	-
<b>Total</b>	<b>\$13.3</b>	<b>\$10.8</b>	<b>\$2.5</b>

## IX. OPERATING COST RESERVE ADJUSTMENT

The operating cost reserve adjustment is a reduction or offset to the ISO revenue requirement for 2017. In any year that the ISO operating reserve account exceeds 15% of the prospective year's O&M budget, the excess goes toward reducing the revenue requirement for the coming year. In addition, the adjustment includes the 25% debt service reserve collected in the previous year and the difference between budgeted revenues and expenses in prior years. For 2017, the ISO forecasts a credit from the operating reserve account of \$5.9 million.

A summary of the adjustment is below.

Operating Cost Reserve Adjustment (\$ in millions)	2017 Budget	2016 Budget	Change
Increase/(decrease) in 15% reserve for O&M budget	\$(0.6)	\$(0.6)	\$ -
25% debt service collection from prior year	3.4	3.4	-
True-up of actual to forecast revenues and other expenses	3.1	1.3	1.8
<b>Total</b>	<b>\$5.9</b>	<b>\$4.1</b>	<b>\$ 1.8</b>

The calculation of the 15% change is as follows.

Change in 15% Operating Reserve (\$ in millions)	2017 Budget	2016 Budget	Change
Change in O&M budget from prior year	\$173.6	\$169.3	\$4.3
Percentage	15%	15%	-
Increase in Operating Reserve requirement	\$26.0	\$25.4	\$0.6

## X. UNBUNDLED GRID MANAGEMENT CHARGE CALCULATIONS

The ISO recovers its costs through separate GMC charges to market participants. The design originally approved in 2011 provides for three service categories and five associated fees and charges. The updated rate design (updated in 2014 ) consisted of changes in two cost categories: the system operations and congestion revenue rights (CRR) services charges, a change in the rate for the transmission ownership rights (TOR) charge and an increase in the revenue requirement maximum to \$202 million. The Board approved the update July 2014. FERC approved the update December 18, 2014, effective January 1, 2015. The ISO derives the rate by dividing the recoverable costs for the category by the estimated billing determinants.

### 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
<b>Service Categories</b>		
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
<b>Fees and Charges</b>		
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 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 revenue requirement from step 4 by adjusted billing determinant volumes from steps 6 and 7 to derive individual service category rates.

### Calculation of Fee Revenue

Fees and Charges	Rate	Estimated Volumes	Estimated Revenue (\$ in thousands)
Bid Segment Fees	\$0.005	59,884,638	\$299
Inter-SC Trade Fees	1.00	2,514,973	2,515
SCID Fees (monthly)	1,000	261	3,132
TOR Fees	0.24	2,714,938	652
CRR Auction Bid Fees	1.00	905,680	906
<b>Total</b>			<b>\$7,504</b>

### Calculation of Service Category Rates

Component	Market Services	System Operations	CRR Services	Total
<b>Allocation of Revenue Requirement (\$ in thousands)</b>				
Total Revenue Requirement				\$195,323
Adjust for (over) /under collection of 2015 rates	\$676	\$1,789	(\$248)	2,216
Remaining to allocate				193,107
Percentages	27%	70%	3%	100%
% allocation of costs	52,139	135,175	5,793	193,107
Combined costs	52,815	136,964	5,545	195,323
<b>Deduct Fee Revenue</b>				
Bid Segment Fees	299	-	-	299
Inter-SC Trade Fees	2,515	-	-	2,515
SCID Fees	3,132	-	-	3,132
TOR Fees	-	652	-	652
CRR Auction Bid Fees	-	-	906	906
<b>Total Fees</b>	<b>5,946</b>	<b>652</b>	<b>906</b>	<b>7,504</b>
<b>Calculation of Recoverable Costs</b>				
<b>Costs Less Fees</b>	<b>\$46,869</b>	<b>\$136,312</b>	<b>\$4,639</b>	<b>\$187,819</b>
<b>Estimated Volumes</b>				
Volumes	548,598,220	455,293,154	781,902,239	
<b>Deduct Exceptions</b>				
Less grandfathered supply	-	4,708,500	-	
<b>Adjusted Volumes</b>	<b>548,598,220</b>	<b>450,584,654</b>	<b>781,902,239</b>	
<b>Resulting Rates</b>	<b>\$0.0854</b>	<b>\$0.3025</b>	<b>\$0.0059</b>	

## Summary of GMC Costs and Rates

### Comparison of Net Revenue Requirements by Service Category (\$ in millions)

Charge Code	Service Category or Fee	2017 Budget	2016 Budget	\$ Variance	% change
4560	Market Service Charge	\$46.9	\$47.0	(\$0.1)	-0.2%
4561	Systems Operations Charge	136.3	137.5	(1.2)	-0.9%
4562	CRR Services Charge	4.6	4.1	0.5	12.2%
4515	Bid Segment Fees	0.3	0.3	-	0.0%
4512	Inter-SC Trades Fees	2.5	2.3	0.2	8.7%
4575	SCID Fees	3.1	2.6	0.5	19.2%
4563	TOR Charges	0.7	0.7	-	0.0%
4516	CRR Auction Bid Fees	0.9	0.8	0.1	12.5%
<b>Total</b>		<b>\$195.3</b>	<b>\$195.3</b>	<b>\$0.0</b>	<b>0.0%</b>

### Comparison of Rates (\$ per unit)

Charge Code	Service Category	2017 Rate	2016 Rate	\$ Variance	Comments
4560	Market Service Charge	\$0.0854	\$0.0850	\$0.0004	Insignificant change from prior year
4561	Systems Operations Charge	\$0.3025	\$0.2979	\$0.0046	Insignificant change from prior year
4562	CRR Services Charge	\$0.0059	\$0.0049	\$0.0010	7% lower volume projected for 2017

The rates for bid segment fees, inter-SC trade fees, SCID fees, TOR charges and CRR auction bid fees are fixed.