

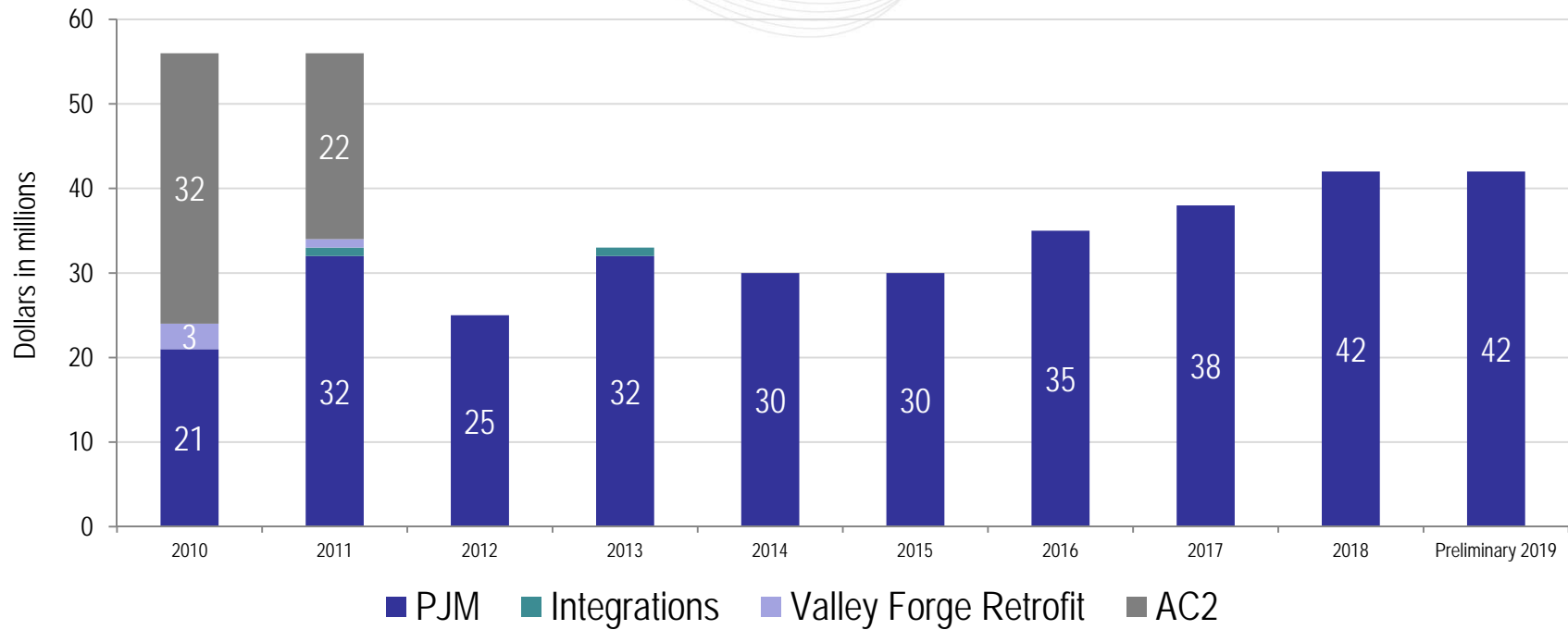


Preliminary 2019 Project Budget

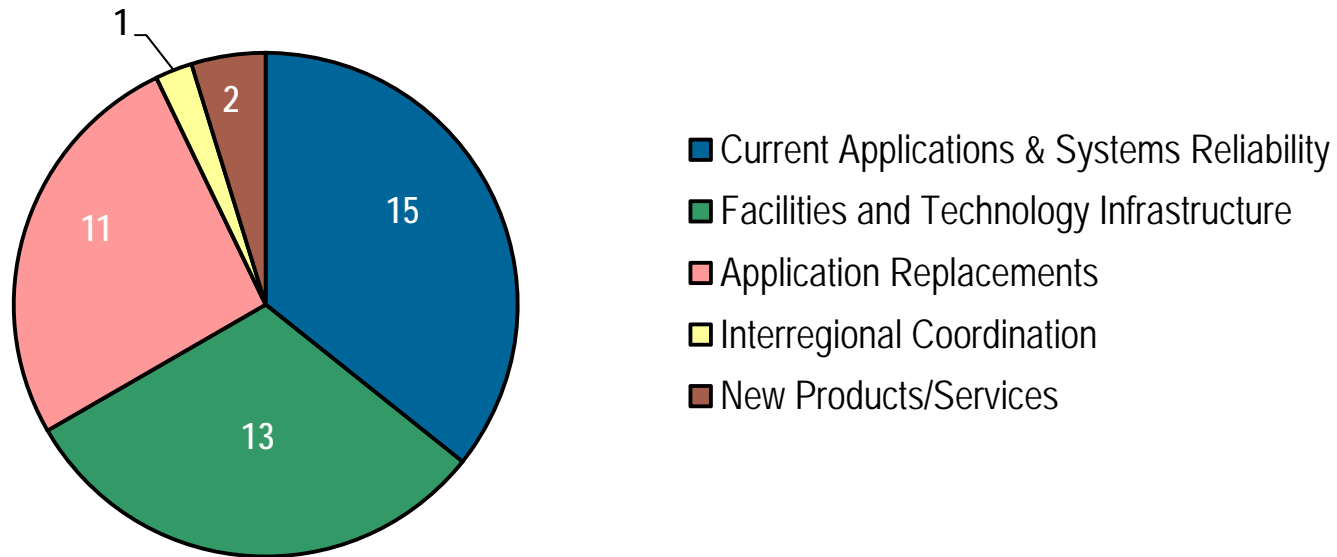
Operating Committee
September 11, 2018
Jim Snow



Annual Capital Expenditures



Total = \$42 million





Current Applications & Systems Reliability

<i>(dollars in millions, except rates)</i>	2018	2019
Capital	14	15
Expense	5	5

Access and Identity Manager – A series of projects to improve provisioning and enhance access workflows for transfer, start up and separation requests.

Ceridian Replacement – This project will consolidate and replace the suite of employee payroll systems into one system.

Cyber Security Enhancements – A series of projects to enhance monitoring and security access of PJM's computer systems.

eDART Refresh and Enhancements – A series of projects to integrate the Dispatcher Application and Reporting Tool (eDART) into PJM's updated standardized software tools framework, and to provide functional enhancements to the application.

Markets Application Improvements – A series of projects to make functionality enhancements to real-time, demand response and other markets-related applications.

Membership Tool Enhancements – A series of projects to enhance the membership resource management tool enabling better member/affiliate management and document accessibility in addition to automating member recertification and other processes.

PJM.com Enhancements 2019 - This project will address functionality updates to PJM.com

Replace Linux software – This project will prepare PJM to migrate applications off of an unsupported operating system by end of 2020 and support new business needs that should be built in new ongoing technology.



Application Replacements/Retrofit

<i>(dollars in millions, except rates)</i>	2018	2019
Capital	11	11
Expense	3	4

Spectrum 7 Upgrade – This project will implement 64 bit architecture allowing for future expansion of PJM's Supervisory Control and Data Acquisition (SCADA) model.

nGEM – This project is a collaborative project with vendor and ISOs/RTOs to transform the market systems architecture, technology and products.

Market Settlements System Refresh – The Market Settlements calculations and reporting systems will be updated and repositioned on a PJM supported platform enabling the retirement of the vendor supported legacy platform.

Corporate Password Vault – This project will implement additional capability managing privileged account passwords providing traceability information and ensuring compliance with NERC CIP standards.

Telephone Systems Refresh – This project will replace PJM's voicemail system.



Facilities and Technology Infrastructure

<i>(dollars in millions, except rates)</i>	2018	2019
Capital	12	13
Expense	1	2

Generator Replacements – These projects will upgrade backup generators that are critical to support keeping the Milford Control Center and Conference and Training Center running in a power loss event.

Computer Room Air Conditioning Replacement – Valley Forge computer room air conditioning units replacement to provide efficient and adequate cooling to equipment.

Data Center and Network Switch Replacements – A series of projects to replace aging network equipment for the central network infrastructure and supporting equipment controlling the flow of network traffic.

Storage Area Network (SAN) Replacement – This project will replace the aging infrastructure that connects servers to storage and database backups for PJM's critical applications and will allow PJM to support CIP compliance direction for physical separation.



Interregional Coordination

<i>(dollars in millions, except rates)</i>	2018	2019
Capital	2	1
Expense	---	---

Market-to-Market Enhancements – This dispatch management tool will implement transmission upgrade study and interchange distribution calculator (IDC) enhancements.

Market-to-Market Freeze Date and Flowgate Allocation– This project will update the historical transmission entitlements calculations to align with planning, markets and operations processes.

NYISO FFE Calculations – This project will redesign of the current Firm Flow Entitlement (FFE) process in an effort to simplify FFE calculations for new and existing re-dispatch flowgates while also accounting for system upgrades.



New Products and Services

<i>(dollars in millions, except rates)</i>	2018	2019
Capital	3	2
Expense	1	1

Energy Price Formation – This project addresses the implementation of market changes that result from FERC’s price formation proceedings. These changes may affect one or more market clearing engines.

Data Miner – This project will expand the capabilities of the Data Miner Platform for membership use to obtain PJM data, i.e. eData Feed.

Energy Storage – This project will implement required changes on PJM’s applications that result from FERC Order 841.

- Video Walls \$1.4M – Replacement of video cubes in the Milford control room and Information Technology Operations Center (ITOC)
- Hardware Replacements \$0.7M – A series of purchases for aging computer hardware
- Milford Computer Room Air Conditioning System Replacement \$0.7M – system near end of life
- Monitoring Tools \$0.5M – Further expansion of monitoring capabilities for PJM computer systems
- Automation of Regional Transmission Expansion Plan and other Corporate Reports \$0.4M
- Implement Soak Time \$0.4M – Add generator ramp time to Day Ahead Markets
- Energy Efficiency and Behind the Meter \$0.3M – implement a tool to register energy efficiency and non-retail behind the meter generation

Date	Group	Topics
August 22	Finance Committee	Preliminary 2019 Budget and Projects
August 23	Markets and Reliability Committee	Preliminary 2019 Projects
September 11	Operating Committee	Preliminary 2019 Projects
September 13	Planning Committee	Preliminary 2019 Projects
September 18	Finance Committee	Proposed 2019 Budget Recommendations
September 21	Finance Committee Member Representatives	Recommendation Letter to PJM Board of Managers
October 2	Board of Managers	Consideration of Proposed 2019 Budget