

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Steering Group Pack



Johnny Johnston

23 August 2016 @ 0900 EST, Res Woods W3-003



Agenda

Topic	Time	Presenter
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Program Update – The First Three Weeks	0910-0935	JJ
<ul style="list-style-type: none">• Kick Off• Workshops• Leadership Alignment Activities• Design Authority• Pilot		
Program Status	0935-0940	KC
Program Staffing Plan Update	0940-0950	KC / JJ
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ



Meeting Objectives

1. Provide an update on the first three weeks of High Level Design activities



Action Item Follow Up

	Action	Owner	Assigned	Due	Comment	Complete?
3	To identify the appropriate approach to ensure that the SG has visibility to the level of customization being undertaken by the project.	JJ	10 Mar 16	1 Oct16	Pending	
5	Advise SG on Powerplan solution options impacting the Program	JJ	5 May 16	Nov 16	Rescheduled for Nov Update	!
6	Review GBE Scope with Finance Remediation	KH	5 May 16	June 16	Rescheduled by Fin – working with RQ for new date	
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Meeting scheduled for 22 August	Proj Aug 16
11	Provide a follow-up on staffing progress and plans	JJ	1 Aug 16	23 Aug 16	In progress	Proj Aug 16

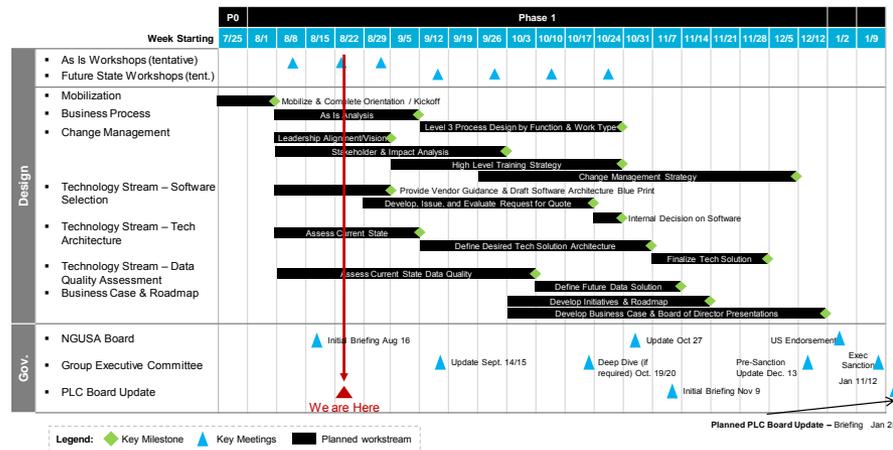


Agenda

Topic	Time	Presenter
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Program Update – The First Three Weeks <ul style="list-style-type: none">• Kick Off• Workshops• Leadership Alignment Activities• Design Authority• Pilot	0910-0935	JJ
Program Status	0935-0940	KC
Program Staffing Plan Update	0940-0950	KC / JJ
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ



High Level Design is underway and on-track



nationalgrid

Internal Kickoff – August 10, 2016





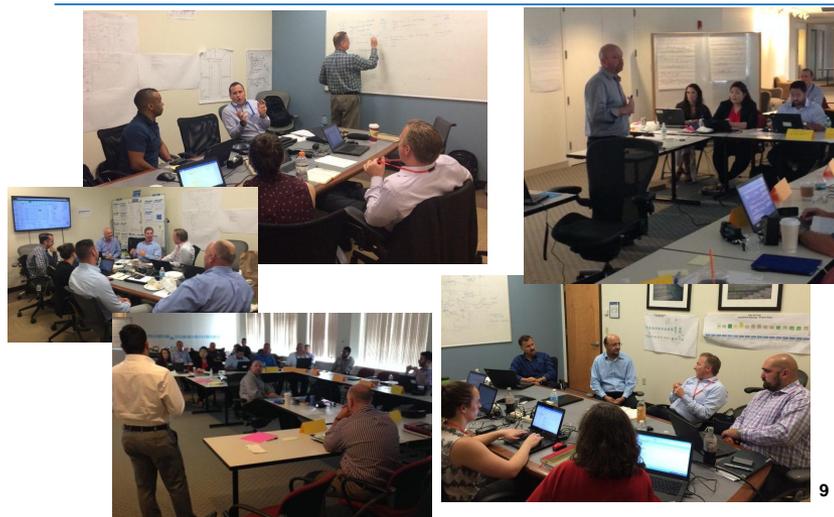
As-Is work shops are well underway

- Conducted two parallel streams of workshops through the first two weeks focused in Work & Contractor Management and Asset Management.
- Both embedded with Customer Experience lens.
- 15 workshops completed
- Significant stakeholder engagement across all jurisdictions
 - CMS, Maintenance, Construction & Shared Services, Call Center, Resource Planning, Process Excellence, Dispatch, Payroll, Accounts Payable, Meter Shop, Regulatory, Compliance, & Others
- 112 SME's participated
- 297 pain points identified



nationalgrid

Workshop Images



nationalgrid Current state assessments of our technology and data landscape have also started

- Current State Information Management, Data, Application and Technology Architecture – On Track
 - Current State Technology Workshops kicked off to develop application and technical architecture “As Is”
 - Artifacts being assembled
 - Cyber Security workshop completed
 - Planning proactive steps to design middleware/integration layer in order to accelerate pivot into delivery and implementation
- Early Guidance on Software Vendors
 - Initial planning and approach defined
- Inflight Initiative Identification
 - Work Session with IS Operations Portfolio completed; further sessions planned with remaining portfolios.



Leadership alignment & stakeholder engagement activity planning has begun

North Star – band B gas leadership September 7

- Objectives:
 - Align on the key opportunities
 - Drafting vision and ambition for the gas business in their own language
 - Commit to lead the change
- Approach:
 - One day offsite session
 - Facilitated by Kotter International
 - Focused on engaging the leaders

Accelerate – band B&C gas leadership October 12 & 13

- Objective:
 - Understanding the vision and ambition for the gas business
 - Drafting the how to achieve results
 - Creating a near-term action plan
- Approach:
 - Two day offsite session – Oct 12/13
 - Facilitated by Kotter and designed as a continuum of North Star session
 - Focused on engaging leaders in creating tangible action plans



The Program Design Authority has been launched

■ Terms of Reference

- Inform – Ensure business leaders are informed on progress and any key issues
- Decide – Make critical decisions on behalf of business to help shape design and business case
- Endorse – High Level Design, Road Map & Business Case
- Own – Defined business benefits and delivery of them
- Manage – Any escalated issues

■ Key Stakeholders

Ross Turrini	John Stavrakas	Anuraag Bhargava	John Spink
Johnny Johnston	Tom Bennett	Amy Stitt	Dan Murray
Neil Proudman	Sue Fleck	Sue Mais	Bill Hilbrunner
Bob DeMarinis	Cedric Williams	Doneen Hobbs	Keith Hutchison
Tim Graham	Sean Mongan	Jody Allison	John Gavin
Fred Amara	Core Team		Extended Team

■ Meeting Cadence

- Monthly In-Person Meeting at Program Office (2 hrs)
- Weekly Phone Conference Briefing (30 min)

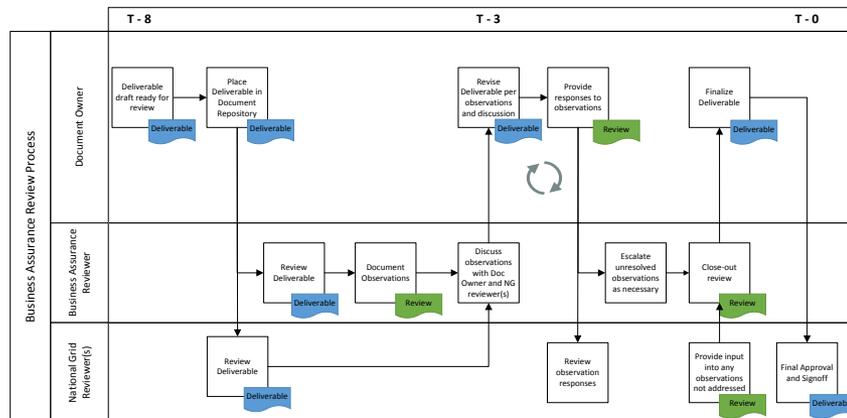


Our Strategic Assessment activities are defined by 20 major deliverables

#	Deliverable	NG Approver (s)	BA	#	Deliverable	NG Approver(s)	BA
1	Detailed Strategic Assessment Project Work Plan	KC Healy		11	Change Impact Analysis	Reihaneh Irani-Famili	
2	Current State Business "Pain Point/Gap" Inventory and Opportunity Analysis	Chris Connolly Chris Murphy		12	Application and technology roadmap including enabling capabilities	Chris Connolly Chris Murphy	
3	Current State structured and unstructured data analysis	Chris Murphy		13	Change Management Strategy	Reihaneh Irani-Famili	
4	Current State Information Management, Application and Technology Architecture	Chris Murphy		14	Risk Inventory Analysis	KC Healy	
5	High-level Business Requirements	Chris Connolly		15	Implementation/deployment approach with recommended phasing	Chris Connolly Chris Murphy Reihaneh Irani-Famili KC Healy	
6	Target Operating Model (High Level Future State Business Process Definition)	Chris Connolly Chris Murphy Reihaneh Irani-Famili Johnny Johnston		16	Prioritized Roadmap of Programs, Projects/Work Packages to Achieve the Required Outcomes	Chris Connolly Chris Murphy Reihaneh Irani-Famili KC Healy	
7	Key Business and Technical Decisions Inventory—Pros and Cons Analysis and Decisions	Chris Connolly Chris Murphy Reihaneh Irani-Famili		17	Resource Plan	Chris Connolly Chris Murphy Reihaneh Irani-Famili KC Healy	
8	Future-state information, application, and integration architecture	Chris Murphy		18	Detailed Financial Breakdown for Delivery of each of the Roadmap Phases	Johnny Johnston	
9	Processes and Key Use Cases for Connected and Disconnected Mobility	Chris Connolly Chris Murphy		19	Executive Board Paper	Johnny Johnston	
10	Software Solution Selection	Chris Murphy		20	SI Work Package (scope, approach, deliverables)	KC Healy	

nationalgrid

Each Deliverable will undergo a rigorous review by our Business Assurance Partner





Our Business Assurance partner will provide detailed assessment of each Deliverable

**High Level Design
Business Case**

Impact Category	Overall Assessment	Key Observations
Simplicity		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Consistency		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Usability		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Visibility		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Agility		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Other		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>

**Initiative
Roadmap**

Impact Category	Overall Assessment	Key Observations
Key Outcomes		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Achievable		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Speed to Value		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>
Other		<ul style="list-style-type: none"> <bullets of key observations> <bullets of key observations>



The Technology Pilot continues to make good progress

We have successfully taken the standardized processes into an agile technology pilot for collections and stopped meter, with Salesforce and Oracle respectively

Collections: The Field Techs, Dispatchers and Supervisors were able to get "hands on" with newly developed software from Salesforce and hardware (an iPad)



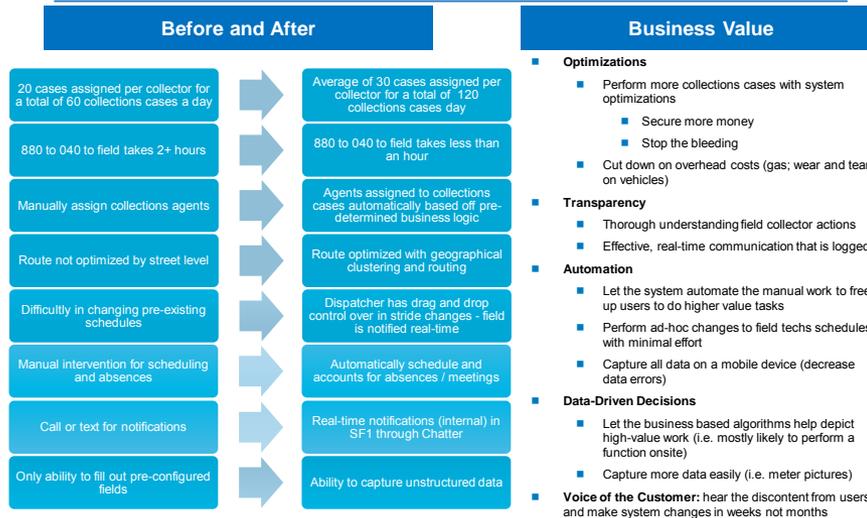
* Field Pilot Planned immediately following Conference Room Pilot

Stopped Meter: Development for sprint 1 has been performed for the mobile field tool and is undergoing stakeholder review





Examples of Business Value that have been identified during the LI Pilot so far...





Agenda

Topic	Time	Presenter
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Program Update – The First Three Weeks	0910-0935	JJ
<ul style="list-style-type: none">• Kick Off• Workshops• Leadership Alignment Activities• Design Authority• Pilot		
Program Status	0935-0940	KC
Program Staffing Plan Update	0940-0950	KC / JJ
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ



Gas Enablement Program Status

Scope Status And Impacts						Schedule	
<ol style="list-style-type: none"> Scope Status: Unchanged from 5 May 16 SG endorsement Scope Change Requests: None pending / planned Next Scope "Inflection Point": As-Is analysis is enabling scope refinement Delivery Approach changes: Evaluating Agile Technology Pilot however no impact to Program timelines, scope or budget is anticipated Major Schedule / Deliverable Changes: None planned / anticipated Customization KPI (TBD) 						<ol style="list-style-type: none"> Key Upcoming Milestones and Deliverables: <ol style="list-style-type: none"> Initiate Change Impact Assessment (8/22) Initiate Data Analysis (8/22) Initiate Software Selection process (8/22) Review Current State Architecture draft (8/22) Continue As - Is work Activities completed <ol style="list-style-type: none"> As-Is, Current State assessments kicked off on 8 Aug Program Internal Kick-Off complete Upcoming activities: <ol style="list-style-type: none"> Review "Plan" Deliverable assessment by PWC Continue Hub and other PM process deployments There are no schedule slippages 	
Resources						Risk	
Staffing	Plan	Actual	In-progress	Open	Trend	<ol style="list-style-type: none"> Planning is underway to conduct a formal risk workshop A risk register has been started and will become a component of the Program Hub meetings Engagement with the National Grid Risk Management Team has been initiated The current draft risk register can be found in the appendix There are no known imminent risks that could impact the program 	
Total	31	19	12				
Finance / Budget Activity				Status	Trend		
Program Budget Submitted							
Forecasted spend (against targets)							
Financial Reporting							
<ol style="list-style-type: none"> Capitalization and work order structure is being defined to facilitate accurate and sustainable cost capture and reporting Recruiting activity is accelerating 3 GDP interviews will begin week 8/22 							



Agenda

Topic	Time	Presenter
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Program Update – The First Three Weeks	0910-0935	JJ
<ul style="list-style-type: none">• Kick Off• Workshops• Leadership Alignment Activities• Design Authority• Pilot		
Program Status	0935-0940	KC
Program Staffing Plan Update	0940-0950	KC / JJ
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ



Our staffing model continues to evolve based on refinement of work approaches and plans

- Based on our early planning, on Aug 1 the Program identified 14 key open roles in Wave 1 (out of 31)
- Subsequently, our plan has been adjusted to reflect a better understanding of priorities, work approaches and timing. 12 Key Wave 1 roles have been identified and are in progress

Staffing Plan as of 1 Aug			Staffing Plan as of 23 Aug		
Position	Target Date	Status	Position	Required By	Status
Process Lead: Data	Sep 12	Offer letter	Filled	8/29	Accepted, inbound
Delivery Lead Fin Controls	Aug 1	Open	Active	9/30	Posn being defined with HR / FI
Delivery Lead Process Controls	Aug 1	Open	Move to Wave 3	1/1	Leverage PEX this Phase
Pilot Business SME's (3ea)	Aug 1	Open	Eliminated	NA	Removed from Plan
Solution Architect	Aug 1	Offer	Active	9/15	Declined, Re-interviewing
Data Architect	Sep 1	Open	Active	9/15	Interviewing
PSC Project Manager	Aug 1	Open	Active	Oct 1	Position being defined with HR
AFT Project Manager (3 ea)	Aug 1	Open	Active	Oct, Nov, Dec	Position being defined with HR
Portfolio Mgt Specialist	Aug 1	Open	Active	Oct 1	Banding complete
Resource Analyst	Aug 1	Open	Move to Wave 2	Nov 1	Position being defined with HR
Func Lead - Asset Management			Active, Wave 2 to 1	9/15	Interviewing
Func Lead - Workforce Mgt			Active, Wave 2 to 1	9/15	Interviewing
Func Lead - Customer Exp			Active, Wave 2 to 1	9/15	Interviewing
Communications Manager			Active, Wave 2 to 1	10/1	Interviewing
Total Key Positions to be filled for Wave 1	14		12		



Agenda

Topic	Time	Presenter
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Program Update – The First Three Weeks	0910-0935	JJ
<ul style="list-style-type: none">• Kick Off• Workshops• Leadership Alignment Activities• Design Authority• Pilot		
Program Status	0935-0940	KC
Program Staffing Plan Update	0945-0950	KC / JJ
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ

nationalgrid

Strategic Assessment Review - PwC

- To be provided during the meeting

nationalgrid

Meeting close

- AOB
- New Action Item Summary
- Leadership Pulse Check and Closing Remarks

nationalgrid

Appendices

Sandy Jones, Accenture Strategic Assessment, Engagement Partner

nationalgrid



Sandy Jones is the North America Digital Field Worker Lead and a Managing Director for Accenture. In this leadership role Sandy is responsible for Accenture's projects in work/asset management, scheduling and mobility. Sandy has 25 years of experience working with gas transmission and distribution organizations and specializes in large scale program change with process re-engineering. Sandy led Accenture's Midstream Pipeline Market from 2013-2015 and is published in the Pipeline & Gas Journal. Sandy received her M.B.A. in Business Strategy and Organizational Behavior from Rensselaer Polytechnic Institute and her B.S. in Industrial Distribution from Clarkson University.

Selected Relevant Experience

- Large Gas Pipeline and Gas Distribution Company—4 Year Transformation Program
 - Developed operating model design and corresponding organization structural design.
 - Generated business case with detailed cost estimates and benefits for a multi-faceted program of over 20 initiatives delivered within approved budget
 - Delivered key organizational changes across 2800 employees.
 - Deployed Maximo, Copperleaf, GIS Consolidation on ESRI and PragmaCad Scheduling and Mobile.
- Mid-sized Gas and Electric Utility—6 Year Program Leadership for:
 - Development of a service-oriented architecture and deployed governance model.
 - Deployment of a new Network Operations Center fitted with tools and dashboards integrated with Systems Operations Center.
 - Asset Management and Operations operating model design and organization restructuring including process ownership and improvement function.
 - Procurement category analysis to identify tangible operational savings.
 - Capital Projects management analysis and roadmap development.
 - Customer service system replacement (SAP CR&B) with integration to Meter Data Management, etc.
- Large Southeast Gas and Electric Utility—Operations Transformation Multi-Year Program
 - Business case development and detailed estimate of end to end Operations Technology program.
 - Managed business process standardization and alignment through change management
 - Deployed Maximo for work management, asset management, and supply chain for gas and electric organizations
 - Operational performance management process and tool deployment.
 - Business case development with detailed cost estimates and benefits identification.
- North America Pipelines Market Lead—2 Year Leadership for:
 - Managed diverse portfolio of clients from the energy and utilities sector that span upstream, midstream and downstream sectors.
 - Assisted trade organizations with thought leadership development on intelligent pipeline management and asset data roadmap strategies.

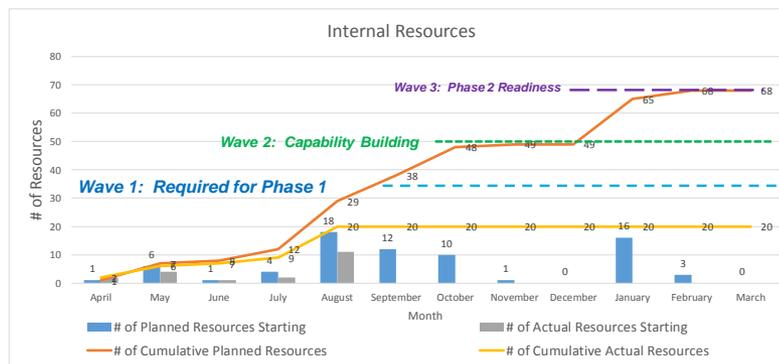


Steering Group Action Item List (complete)

	Action	Owner	Assigned	Due	Comment	Complete?
1	Ensure that Enablement is added to the QPR agenda	PS	10 Mar 16	1 Apr 16		Yes
2	To provide visibility of the expect impact of Gas Business enablement on the ability to run the business due to a potential talent drain.	JJ	10 Mar 16	1 May 16	Phase 1 key roles have been filled with Business Leadership engagement and support. Subsequent staffing requirements will be reviewed regularly with the Design Authority	Aug 16
3	To identify the appropriate approach to ensure that the SG has visibility to the level of customization being undertaken by the project.	JJ	10 Mar 16	1 Oct 16	Pending	
4	To share the rate case strategy and ensure that any appropriate costs are included in the MA Gas rate case.	JJ	10 Mar 16	1 Jul 16	Action Plan: 1) Engaging with NY rate case team 2) Coordinating with MA to include GE costs in the MA Gas case 3) Will work with Finance to deploy effective tools and processes to capture and report rate case data 4) Insure GE business case is rate case enabling	Aug 16
5	Advise SG on Powerplan solution options impacting the Program	JJ	5 May 16	Nov 16	Rescheduled for Nov Update	!
6	Review GBE Scope with Finance Remediation	KH	5 May 16	June 16	Rescheduled by Fin -- working with RQ for new date	
7	Add controls development to design phase success criteria	KH	5 May 16	June 16		Yes
8	Update the SG on proposal detail and procurement process status and selection criteria	JJ	5 May 16	June 16		Yes
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Meeting scheduled for 22 August	Proj Aug 16
10	Invite Internal Assurance to participate in vendor oral presentations and proposal review	KC	24 June 16	July 16	Complete -- input received	Yes
11	Provide a follow-up on staffing progress and plans	JJ	1 Aug 16	23 Aug 16	In progress	27

nationalgrid

The Program sanction will support activation of all three staffing waves



Staffing Process Highlights:

- While the program sanction will support activation of all three waves, evaluation of all staffing requirements will be ongoing
- The decision to activate Waves 2 and 3 will be based on criteria including
 - Timing, scope and likelihood of the Phase 2 sanction and kick-off
 - Early indications from the developing road map and business case
 - Value and quality

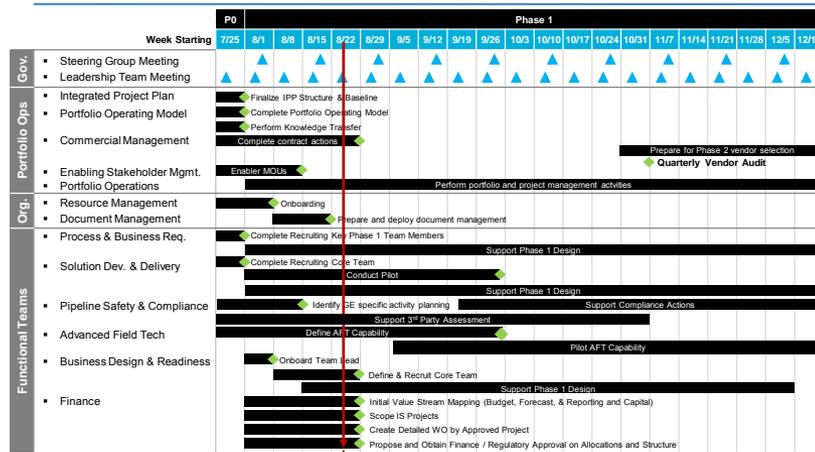


Draft Program Risk Register (under development)

Risk	Actions
Missing expectations on progress due to slow start	<ul style="list-style-type: none"> • Key LT members completing legacy commitments • Remaining LT member being on-boarded • Detailed plan and staffing model being developed concurrently with Partner proposals
Unsuccessful delivery due to scope creep and overlap with other initiatives	<ul style="list-style-type: none"> • Building scope around business case -- will use Steering Group to baseline scope and any changes going forwards • Reporting spending to plan (i.e., budget) monthly • Coordinating with Growth Playbook initiatives to avoid duplication or gaps with other activities
Risk to delivery due to business/IS capacity limitations	<ul style="list-style-type: none"> • Will track progress and escalate specific areas of risk/ concern to Steering Group and through cadence • Proactively engaging with Business and Function stakeholders to identify support requirements and potential staffing constraints • Developing integration model to identify IS dependencies and constraints
Delays in labor union engagement could impact workshop participation	<ul style="list-style-type: none"> • Develop engagement plan • Aggressive follow-through on engagement activities • Identify SME alternatives
Lack of formal data quality analysis could impact design activities	<ul style="list-style-type: none"> • Early engagement with National Grid SME's and Points of Contact to identify potential issues • Identify potential workarounds and incorporate into the work plan prior to task initiation
Short term, required compliance mitigation activities could negatively impact the deployment of long term plans	<ul style="list-style-type: none"> • Complete 3rd Party Compliance Assessment • Develop comprehensive action plan to address findings • Identify and prioritize urgent actions and evaluate any negative impacts to the long term activities (regret costs, program expenses etc) • Develop detailed mitigation plans

nationalgrid

An Integrated program has been developed and subject to final detailed planning with our partners can be base-lined



We are Here

Legend: ◆ Key Milestone ▲ Key Meetings ■ Planned Workstream

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Steering Group Pack



Johnny Johnston

29 September 2016 @ 0900 EST, Res Woods W3-003



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Current State Assessment – Highlights	0910-0915	JJ
“Strategic Decisions”	0915-0940	JJ
Pilot Program Wrap-Up	0940-0945	JJ
Program Status	0945-0950	KC
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ



Meeting Objectives

1. Obtain Steering Group endorsement of Design Authority decisions on Gas Business strategic capability targets, opportunities and priorities
2. Provide an overview of key High Level Design activities to date



Action Item Follow Up

	Action	Owner	Assigned	Due	Comment	Complete?
3	To identify the appropriate approach to ensure that the SG has visibility to the level of customization being undertaken by the project.	JJ	10 Mar 16	1 Oct 16	Pending	
5	Advise SG on Powerplan solution options impacting the Program	JJ	5 May 16	Nov 16	Rescheduled for Nov Update	!
6	Review GBE Scope with Finance Remediation	KH	5 May 16	June 16	Update to Finance Leadership Team 9/14	Complete
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Pending completion of CWIP Analysis	
11	Provide a follow-up on staffing progress and plans	JJ	1 Aug 16	23 Aug 16	Completed in 23 Aug SG Update	Complete

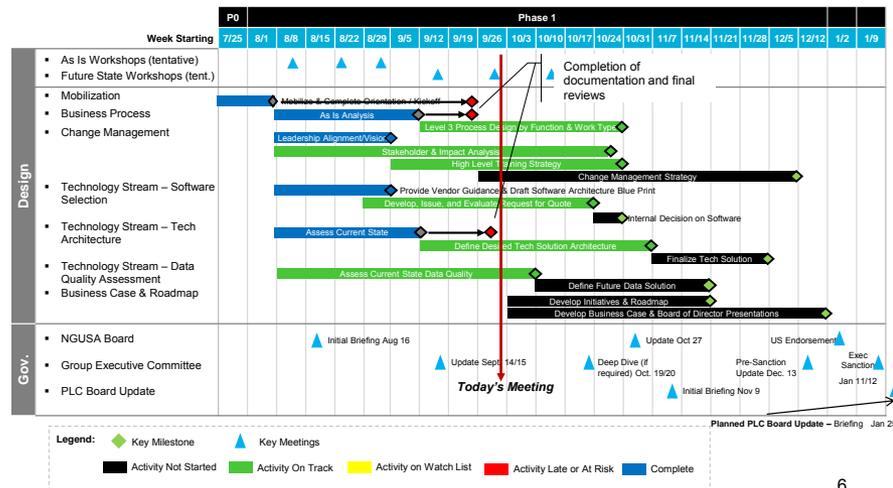


Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Current State Assessment – Highlights	0910-0915	JJ
“Strategic Decisions”	0915-0940	JJ
Pilot Program Wrap-Up	0940-0945	JJ
Program Status	0945-0950	KC
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ

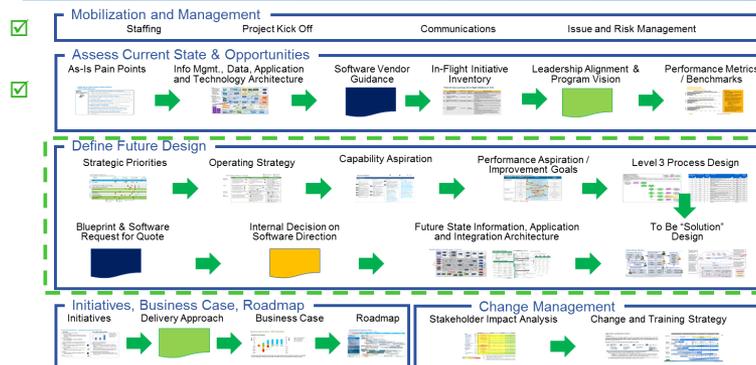
nationalgrid

Overall, key Program activities remain on track however finalization of some deliverables is late. This is a focus area





The Program is moving from current state assessment to future state design



- Prepare for and Hold Future State "To Be" Design Workshops
- Integrate Input of Executive Visioning / North Star Activities
- Define Desired Technology Solution Architecture

7



“As Is” Workshops have been completed

The current state assessment was a four week study engaging the business with core process teams consisting of National Grid and Accenture. The team was divided into two work streams with Customer and Data embedded within those groups:

- Work & Contractor Management
- Asset Management

Common themes emerged from the sessions collected from the pain points. The findings shape our opportunities and future state aspirations

Workshop success factors	Outcomes
Level of Engagement	• High level of engagement and positive feedback received by core teams and GE leadership through 17 workshops
Organizational Outreach	• Conducted workshops in each operating company with 32 organizations participating
Relevant data collection	• 426 pain points collected (initially and refined) categorized by Data, Reporting & Metrics, Regulatory, Role Based, Process, System, and Customer Experience
Holistic view of current state	• Process nuances by operating company and type of work defined distinctly along with associated systems and roles performing specific process steps

8

Current state findings in work management and customer experience nationalgrid

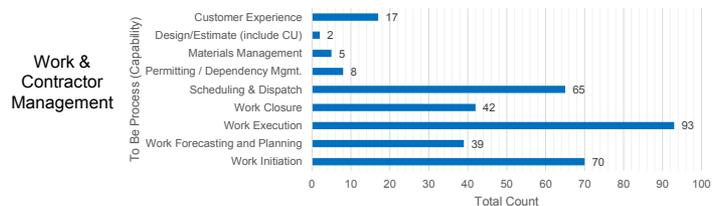
	<i>Common Themes</i>	<i>High Level Pain Points</i>	<i>Future State Aspirations</i>
1	Visibility of Work & Resources	<ul style="list-style-type: none"> Work initiated in multiple systems Not all work is added to a system; manual work arounds are common Work and resource statuses are not visible to relevant stakeholders 	Increased automation between systems
2	Integration between Systems	<ul style="list-style-type: none"> Integrations between the customer, work management and dispatch tools are minimal Inconsistent processes and workaround tools (Excel, MS Access databases) used to manage work as it flows through the systems 	Single source of truth for relevant data Increase in regulatory compliance
3	Data Accuracy	<ul style="list-style-type: none"> Heavy use of paper contributes to inaccuracy of data Data managed in multiple systems without definitive system of record 	Standardized and consistent processes
4	Agility	<ul style="list-style-type: none"> Existing technology does not provide the flexibility to adapt to changing regulatory requirements and customer demands Relevant information not readily available to execute tasks 	Consistent and reliable performance measures Increased first touch resolution
6	Roles & KPIs	<ul style="list-style-type: none"> Workaround processes create excessive administrative responsibilities for Field Supervisors Inconsistent metrics & KPIs hinder organizational best practice 	Improved long & short term forecasts/plan and relevant activities
6	Customer Visibility & Communication	<ul style="list-style-type: none"> Departments have minimal visibility into field activities or work status Limited self-service tools are available to customers; no confirmation or validation of work status or completion Customer communications are typically fragmented or non-existent for certain work types 	Increased supervisor time in the field Improved customer satisfaction
7	Customer Expectations	<ul style="list-style-type: none"> Inflexible appointment options do not meet the customer demand Inability to provide the customer with specific and accurate timeframes for long cycle work 	9

Current state findings in asset management

<i>Common Themes</i>	<i>High Level Pain Points</i>	<i>Future State Aspirations</i>
1 Design and Construction Execution Inconsistencies	<ul style="list-style-type: none"> Roles responsible for Design through the Construction process varies significantly across jurisdictions Variation of Work Package expectations and common understanding of Standard Design and Complex Design across and within jurisdictions 	<p>Opportunity to conduct asset risk consistently for all asset classes, across asset classes, and across jurisdictions.</p>
2 Data Quality Impacts Asset Decision Making	<ul style="list-style-type: none"> Asset Data Quality is a common concern and foundational for asset decision making Duplicate data entry in the field (4 different systems for a service install) 	<p>Opportunity to improve the sanctioning process. This includes multiple grades of design/estimate and a distinction between project/program approval and plan approval as well as building a multi-year pipeline of work.</p>
3 Asset Risk Prioritization Process	<ul style="list-style-type: none"> A more holistic view across the network and among asset classes is needed for enhanced decision making Lack of a consistent asset register (EAM, GIS, etc.) 	<p>Opportunity to have a more complete (e.g., service lines, conflation resolved) network connectivity model in the GIS and a single GIS across jurisdictions.</p>
4 Mapping System Challenges	<ul style="list-style-type: none"> Mapping system constraints lead to inaccurate models and design errors resulting in changes during construction 	<p>Opportunity to streamline the design, estimate, and as-built process from a role, process, and technology perspective to drive consistency.</p>
5 Design/Estimating Accuracy and Sanctioning Efficiency	<ul style="list-style-type: none"> Estimating, budgeting, and sanctioning timelines are crunched Inaccuracy of estimates leads to budgeting challenges 	<p>Opportunity to have a more consistent and dynamic asset data capture process not only from a work completion standpoint but also evolving PHMSA requirements.</p>
6 Resource Constraints Impact Asset Planning	<ul style="list-style-type: none"> Asset Managers are forced to revise their plans due to resource constraints 	

nationalgrid

These pain points have been mapped to capabilities to support effective “To Be” process design





We have begun the Software Selection Process to inform the business case

- ✓ Early guidance and analysis on software vendors complete
- ✓ Request for Information/Request for Quotation (RFI/RFQ) Issued 9/20 for “Exploration and Assessment”
- Responses due 10/7
- Planning for a quick transition to RFP to minimize downtime post-sanction

Vendors	Enterprise Asset Management	Resource Mgmt	Mobility
SAP	✓		✓
IBM	✓		✓
CGI	✓		
ABB	✓	✓	✓
ClickSoftware		✓	✓
Salesforce		✓	✓
Oracle		✓	✓



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Current State Assessment – Highlights	0910-0915	JJ
“Strategic Decisions”	0915-0940	JJ
Pilot Program Wrap-Up	0940-0945	JJ
Program Status	0945-0950	KC
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ

Our Opportunity (Draft)

nationalgrid

We are proud of what we do.

However, we are all frustrated - and the way we work doesn't meet our customers' and regulators' expectations, putting our future growth at risk.

It's our time to fix it/make a change - through employee-driven solutions to deliver industry-leading performance.

We are committed to invest in our business to unlock our passion and potential to build trust among ourselves, and with our customers, communities and regulators.

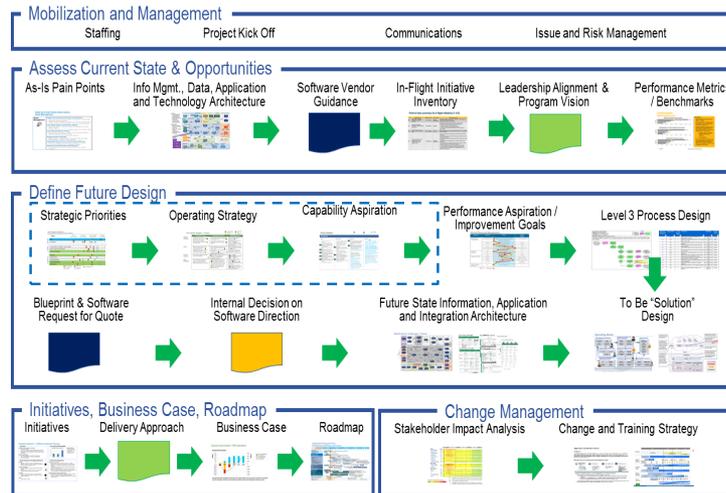
Our Service Territory offers the greatest opportunity for growth. We have talented people. Working together we will fix today and enable tomorrow.

Objectives

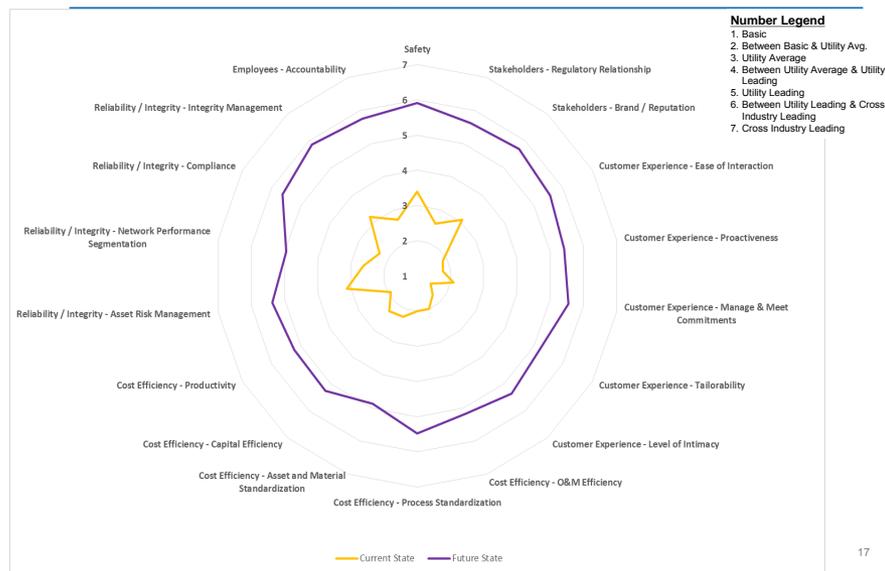
nationalgrid

- 1) ***Approach to Strategic Priorities and Operating Strategy***
- 2) ***Strategic Priorities***
 - Discussion about and endorsement of where the Gas Business should focus over the next 5 years
- 3) ***Operating Strategy***
 - Discuss about and endorsement of operating model approach

Approach of the GBE Program

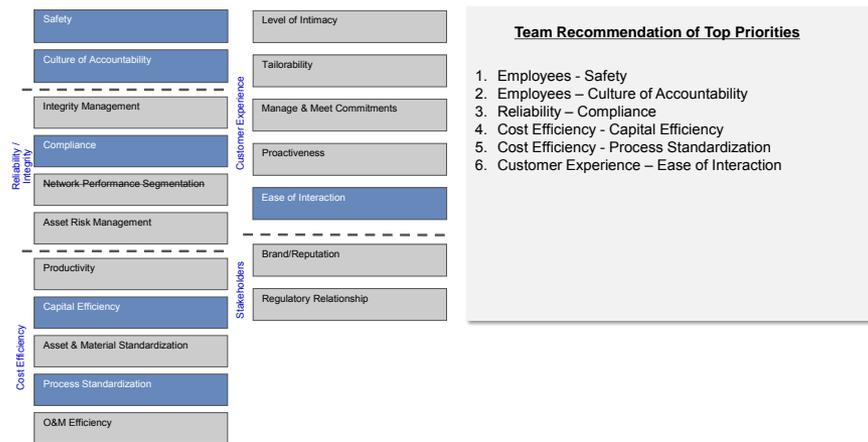


Survey Results: All Responses



17

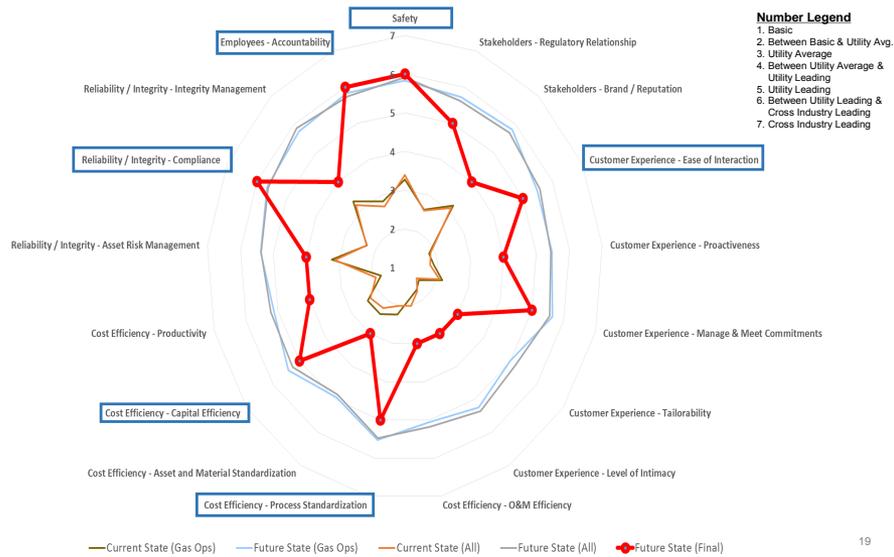
Gas Business Strategic Priorities: Recommended Strategic Priorities



■ Recommendation

Gas Business 3 to 5 year Ambition

Comparison current state assessment to aspiration of the gas business



Operating Strategy nationalgrid

Operating Model Dimensions and Operating Strategy

*An **operating model** articulates where and how core work gets done across an organization
An **operating strategy** involves making decisions with regard to the operating model to optimize the deployment of resources to deliver an organization's strategic objectives and achieve its goals.*

Six Dimensions of an Operating Model

- **Organization Architecture:** How the capabilities are grouped and the people organized to deliver the company's objectives and goals
- **People & Culture:** The skills and experience, roles and job positions, desired behaviors, and mindset required to develop, cultivate, and retain talent.
- **Process Architecture:** The detailed processes for all core activities including responsible roles, key interactions, coordination points, and handoffs.
- **Technology, Information, and Data:** The overall technology blueprint and information and data architectures and how the technology enables the model.
- **Performance Framework:** How performance will be measured including line of sight to strategic objectives, scorecards, metrics and targets, and mechanism to build performance metrics and targets into the people performance management system.
- **Governance:** The overall governance structure, key governance bodies and membership, and decisions rights.

Operating Strategy Decisions

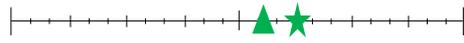
- Critical decisions required to define elements of an operating model.
- Decisions on optimization and deployment of resources ensuring effectiveness of the organization to deliver on its strategic priorities.
- **Focus for Today:**
 - **Centralization** - How should the organization be organized? How centralized? → **Organization Architecture**
 - **Standardization** - How standardized should the organization be? → **Process Architecture**

Standardization Category: *People & Culture, Process Architecture, Technology, Performance Framework* nationalgrid

Topic	Spectrum
<p>In general, how standardized is the current business / operations and what level of standardization should it be in the future?</p> <p><i>Key Questions / Considerations</i></p> <ul style="list-style-type: none"> • How similar or dissimilar are the geographies / jurisdictions? • Will one approach work for all geographies / jurisdictions? • Are there regulatory elements that may prevent standardization? 	<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> <p>Locally / Geographically Tailored</p>  </div> <div style="text-align: center;"> <p>Standardized, "One National Grid Way"</p>  </div> </div> <p style="text-align: center;">Flexibility to apply what is needed, when, and where. Unified, standardized execution.</p> <p>Current State Differences in processes, technology, data / information, organization / role, and metrics / KPIs exist across jurisdictions and in some cases within jurisdictions despite prior efforts to standardize.</p> <p>Future State Desire to get to one system with flexibility to meet jurisdictional regulatory requirements and recognize regional and geographic differences (e.g., upstate vs. downstate NY).</p>



Centralization Category: Organization Architecture

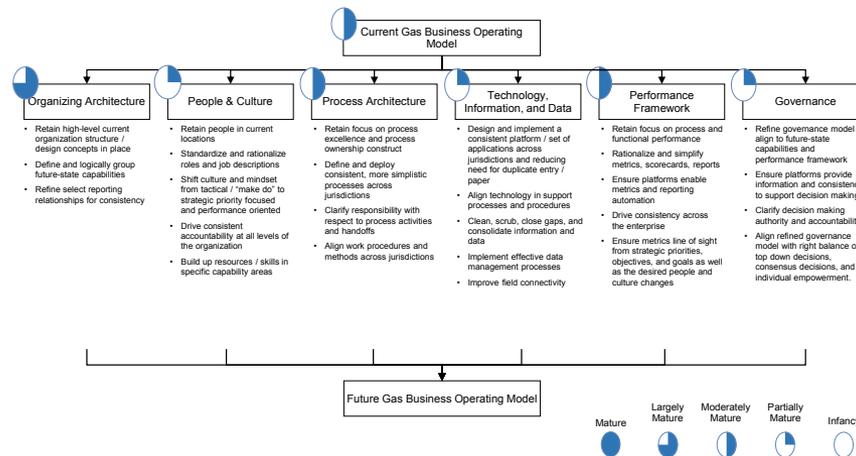
Topic	Spectrum
<p>In general, how centralized are capabilities today and how centralized should they be in the future?</p> <p><i>Key Questions / Considerations</i></p> <ul style="list-style-type: none"> • Will the current level of centralization support strategic objectives and goals? • Would further centralization and dedicated Centers of Excellence better support strategic objectives and goals? • Is local accountability and presence important or critical to achieving strategic objectives and goals? 	<div style="text-align: center;"> <p>Decentralized, Local Model Centralized Model</p>  </div> <p style="text-align: center;">Local accountability, responsive to customers, workers, and the community. Centralized capabilities and accountability.</p> <p>Current State Pre-established conceptual model of key functions (e.g. scheduling, design) are already centralized.</p> <p>Future State Favor a tendency toward centralized standards and process with flexibility for local execution; keep centralized functions that exist, build for future with more centralized functions as appropriate / when makes sense / value; regional presence important in jurisdictional model for customer engagement and local knowledge.</p>



Operating Strategy: Current Perspective on Maturity of Current Operating Model



An evaluation of the current Gas Business operating model using the key takeaways from the GBE Leadership working session shows progress toward industry leading characteristics reflected by maturity across a few key dimensions (e.g., organizing architecture, process architecture, and performance framework) but also shows significant room to improve across the remaining key dimensions (e.g., people & culture, technology, and governance).





Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Current State Assessment – Highlights	0910-0915	JJ
“Strategic Decisions”	0915-0940	JJ
Pilot Program Wrap-Up	0940-0945	JJ
Program Status	0945-0950	KC
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ



The Technology Pilots are driving toward completion

We have successfully completed the agile technology pilot for LI; The Stopped Meter pilot in upstate NY continues on track

Collections: The Field Techs, Dispatchers and Supervisors were able to use the newly developed solution in the field for live work.



Stopped Meter: Development for sprint 1 has been performed for the mobile field tool and is undergoing stakeholder review





Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Current State Assessment – Highlights	0910-0915	JJ
“Strategic Decisions”	0915-0940	JJ
Pilot Program Wrap-Up	0940-0945	JJ
Program Status	0945-0950	KC
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ



Gas Enablement Program Status

Scope Status And Impacts						Schedule Highlights																																															
<ol style="list-style-type: none"> 1) Scope Status: Unchanged from 5 May 16 SG endorsement 2) Scope Change Requests: Compliance – Field Training, RFP active, evaluating impacts to plan and budget 3) Next Scope "Inflection Point": 3rd Party Compliance Assessment / Gas Enablement Alignment Meeting 9/29 4) Delivery Approach changes: Evaluating Agile Technology Pilot however no impact to Program timelines, scope or budget is anticipated 5) Major Schedule / Deliverable Changes: Continuing to refine Pipeline Safety and Compliance and Advanced Field Technology to define key milestones and deliverables 6) Customization KPI (TBD) 						<ol style="list-style-type: none"> 1) Key Milestones and Deliverables: <ol style="list-style-type: none"> 1) Initiated To Be Workshops - 9/20 2) Initiated Future State Technology Analysis - 9/13 3) Software Selection in "RFQ" Phase – TBC 10/21 4) Compliance Integration begins 9/29 – 11/30 2) Activities completed <ol style="list-style-type: none"> 1) As Is Workshops, and Current State Architecture Analysis 2) North Star Leadership Engagement 3) Upcoming activities: <ol style="list-style-type: none"> 1) 3rd Party Compliance Analysis / GE Prog Alignment – 9/29 2) Prepare for Gas Business Accelerate Event -10/12-13 4) Schedule status: Work progress, but final documentation of "As Is" deliverables lags 																																															
Resources						Risk																																															
<table border="1"> <thead> <tr> <th>Staffing</th> <th>Plan</th> <th>Actual</th> <th>In-progress</th> <th>Open</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Total</td> <td>31</td> <td>20</td> <td>11</td> <td></td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Finance / Budget Activity</th> <th>Status</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Program Budget Submitted</td> <td></td> <td></td> </tr> <tr> <td>Forecasted spend (against targets)</td> <td></td> <td></td> </tr> <tr> <td>Financial Reporting</td> <td></td> <td></td> </tr> </tbody> </table> <ol style="list-style-type: none"> 1) People: 11 Offers made for early / mid Oct starts 2) Evaluating and preparing for Wave 2/3 requirements (up to an additional 36) 3) August financial reporting – identified significant positive variance to plan – 7 FTEs charging old acctg, Invoice timing 4) Aligning Business / Program compliance budgets 						Staffing	Plan	Actual	In-progress	Open	Trend	Total	31	20	11			Finance / Budget Activity	Status	Trend	Program Budget Submitted			Forecasted spend (against targets)			Financial Reporting			<table border="1"> <thead> <tr> <th colspan="4">Top Three Risks</th> </tr> <tr> <th>Risk</th> <th>Prob</th> <th>Impact</th> <th>Mitigation Status</th> </tr> </thead> <tbody> <tr> <td>Missing Expectations on progress due to slow start or late Phase 1 Completion</td> <td>Med</td> <td>Very High</td> <td>Mitigated - Monitoring</td> </tr> <tr> <td>Risk to Delivery Due to IS and Business capacity limitations</td> <td>High</td> <td>High</td> <td>Mitigated - Monitoring</td> </tr> <tr> <td>Gaps in data and/or our understanding of quality and availability</td> <td>High</td> <td>High</td> <td>Mitigation plan under development</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 1) First formal Program risk workshop conducted on 9/12, follow-ups being planned 2) Linkage of Program and Enterprise risk management processes to take place in mid Oct (date tbd) 				Top Three Risks				Risk	Prob	Impact	Mitigation Status	Missing Expectations on progress due to slow start or late Phase 1 Completion	Med	Very High	Mitigated - Monitoring	Risk to Delivery Due to IS and Business capacity limitations	High	High	Mitigated - Monitoring	Gaps in data and/or our understanding of quality and availability	High	High	Mitigation plan under development
Staffing	Plan	Actual	In-progress	Open	Trend																																																
Total	31	20	11																																																		
Finance / Budget Activity	Status	Trend																																																			
Program Budget Submitted																																																					
Forecasted spend (against targets)																																																					
Financial Reporting																																																					
Top Three Risks																																																					
Risk	Prob	Impact	Mitigation Status																																																		
Missing Expectations on progress due to slow start or late Phase 1 Completion	Med	Very High	Mitigated - Monitoring																																																		
Risk to Delivery Due to IS and Business capacity limitations	High	High	Mitigated - Monitoring																																																		
Gaps in data and/or our understanding of quality and availability	High	High	Mitigation plan under development																																																		



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900-0905	JJ
Action Item Follow Up	0905-0910	KC
Current State Assessment – Highlights	0910-0915	JJ
“Strategic Decisions”	0915-0940	JJ
Pilot Program Wrap-Up	0940-0945	JJ
Program Status	0945-0950	KC
Business Assurance Partner Update	0950-0955	CF
Meeting Close & Feedback	0955-1000	JJ

Strategic Assessment Review - PwC

- **Deliverables reviewed**

- **Current State Business “Pain Point / Gap” Inventory and Opportunity analysis**
Addresses the various elements of a customer experience, work and asset management system
(i.e. people, structure, process, applications/technology, data, reporting/metrics and culture)

- **Deliverable review process** - adjusted to give PwC a proactive preview – and reduce rework

Intensity of deliverable production and review is due to pick up strongly

Observations	Recommendations
Initial To-Be Modeling workshops performed at too high a level – this would miss key benefits to be derived from this strategic assessment	<ol style="list-style-type: none"> 1) To-Be Modeling must be at Level 3 detail (Processes and process steps) 2) Opportunities, pain points and applications should be linked to process steps; use swim lanes or link steps to roles 3) Start with a leading practice baseline - workshop leads should add value in discussing opportunities and leading practices – create the to-be vision
Opportunity analysis missed on Deliverable 2 (above)	<ol style="list-style-type: none"> 1) Review the pain point list and link to opportunities 2) Develop list of opportunities to be addressed in To-Be design for each business capability (e.g. leading practices; gaps; new technology; relevant strategic priorities)
Prior key observation	
Ensure Assessment approach and plan includes clear linkage to business strategies and outcomes	<p>Include project activities to develop tactics/levers that will enable strategies and link these to required business capabilities – ensure program is truly outcome-driven</p> <p>Remedial action to date – strategic priorities have been developed (first tier of levers)</p>

9

nationalgrid

Meeting close

- AOB
- New Action Item Summary
- Leadership Pulse Check and Closing Remarks

nationalgrid

Appendices

Action Item Log
Risk Register
Program Schedule
LI Collections Pilot Overview



Steering Group Action Item List (complete)

	Action	Owner	Assigned	Due	Comment	Complete?
1	Ensure that Enablement is added to the QPR agenda	PS	10 Mar 16	1 Apr 16		Yes
2	To provide visibility of the expect impact of Gas Business enablement on the ability to run the business due to a potential talent drain.	JJ	10 Mar 16	1 May 16	Phase 1 key roles have been filled with Business Leadership engagement and support. Subsequent staffing requirements will be reviewed regularly with the Design Authority	Aug 16
3	To identify the appropriate approach to ensure that the SG has visibility to the level of customization being undertaken by the project.	JJ	10 Mar 16	1 Oct 16	Pending	
4	To share the rate case strategy and ensure that any appropriate costs are included in the MA Gas rate case.	JJ	10 Mar 16	1 Jul 16	Action Plan: 1) Engaging with NY rate case team 2) Coordinating with MA to include GE costs in the MA Gas case 3) Will work with Finance to deploy effective tools and processes to capture and report rate case data 4) Insure GE business case is rate case enabling	Aug 16
5	Advise SG on Powerplan solution options impacting the Program	JJ	5 May 16	Nov 16	Rescheduled for Nov Update	↓
6	Review GBE Scope with Finance Remediation	KH	5 May 16	June 16	Rescheduled by Fin – working with RQ for new date	9/14
7	Add controls development to design phase success criteria	KH	5 May 16	June 16		Yes
8	Update the SG on proposal detail and procurement process status and selection criteria	JJ	5 May 16	June 16		Yes
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Pending completion of CWIP Analysis	Proj Aug 16
10	Invite Internal Assurance to participate in vendor oral presentations and proposal review	KC	24 June 16	July 16	Complete – Input received	Yes
11	Provide a follow-up on staffing progress and plans	JJ	1 Aug 16	23 Aug 16	Complete	8/23

32

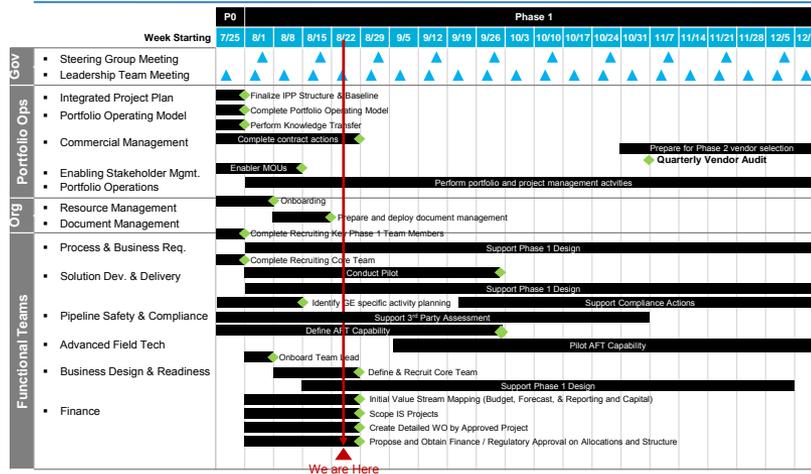
Program Risk Register – 9/23



Raised by	Date Raised	Probabil	Impact	Description & Potential Impact	Planned Action to Prevent	Owner	Due Date	Status	Date Closed/Cancel/Deferral	Notes/Update	Phase Identified	Impact	Category	Impacted Item
Cornely, Christopher	09/12/2016	High	High	The program is dependent on multiple services and SMEs provided by the Functions, Business. Support delays and SME unavailability could impact timelines	Mitigation - proactive planning and coordination, proactive engagement, IS integration model	Johnston, Johnny	12/22/2016	Proposed		Mitigation - proactive planning and coordination, proactive engagement, IS integration model	Phase 1	High	Program	High Level Design
Johnston, Johnny	03/01/2016	High	High	The desired end state is one software solution for each software category. If this is not possible, it will raise the level of complexity of our future state design and increase costs and lengthen timelines in both Phase 1 and Phase 2	Under development	Murphy, Chris- US IT	09/28/2016	In Progress		9/13 CM and CH to further define the risk and propose a mitigation plan. 9/22 Scheduled for PLT review 9/28	Phase 1	High	Program	High Level Design
Houchens, Granville	09/12/2016	Medium	High	If we don't complete our staffing process by our target date, it will mean that we have insufficient resources to effectively plan and deliver Phase 2 projects. This could result in delays, increased costs.	A disproportionate emphasis on short compliance fees could consume the time, resources and expertise required to launch and sustain longer term fees	DuRamos, JWynn	10/31/2016	In Progress			Phase 1	High	Staffing	PM
Healy III, Kenneth	09/20/2016	Medium	High	A disproportionate emphasis on short compliance fees could consume the time, resources and expertise required to launch and sustain longer term fees	Complete 3rd Party Assessment, develop integrated plan to deliver recommendations, perform trade off analysis (short vs long term) develop detailed plans for Business and GE compliance activities	Mohamran, Daniel F	12/22/2016	Solution		Complete 3rd Party Assessment, develop integrated plan to deliver recommendations, perform trade off analysis (short vs long term) develop detailed plans for Business and GE compliance activities	Phase 1	High	Delivery	Compliance
Mohamran, Daniel F	08/01/2016	Medium	High	Does the program have the sufficient team depth to overcome the effects of unplanned departures	Under development	DuRamos, JWynn	09/21/2016	In Progress		9/13 JD to further define the risk and coordinate development of a mitigation plan. 9/22 - scheduled for review in 9/28 PLT	Phase 1	Low	Program	High Level Design
Cornely, Christopher	09/12/2016	Medium	Low	Not accounting for the impacts/integration points/scope overlaps between GE and other programs could create scope overlap and/or conflicts. This could result in increased costs or delays in schedules	Under development	Murphy, Chris- US IT	09/28/2016	In Progress		9/13 - Assigned to Chris M to further define the risk and to develop a mitigation plan. 9/22 KCH - scheduled for review in 9/28 PLT	Phase 1	Medium	Program	High Level Design
Boyd, Stephen	09/12/2016	Medium	Medium	potentially a risk around enablement keeping joined up with other initiatives - eg Supervisor Enablement and strategic workforce planning	Under development	DuRamos, JWynn	10/31/2016	In Progress		This risk might possibly overlap with another risk - JWynn will. This is a risk I will bring up on my HR meeting as the HRBPs are very close to various initiatives within their client groups and I think will be a good starting point.	Phase 1	Medium	Workforce	Planning
Johnston, Johnny	09/21/2016	Medium	Medium	Failure to engage represented employees in the as is to be design process could mean that critical information, observations and expert inputs are missing from the high level design process	Develop engagement plan, aggressive follow-through, identify SME alternatives	Cornely, Christopher	10/21/2016	Solution		Develop engagement plan, aggressive follow-through, identify SME alternatives	Phase 1	Medium	Quality	High Level Design
Johnston, Johnny	03/01/2016	Medium	Medium	Delays in starting the program in a timely manner will impact long term timelines. Failure to complete Phase 1 deliverables in a timely manner could delay the sanctioning process and further delay kick off of deployment work	See Program Plan, Implement stage gating and daily PM processes, Implement Governance	Johnston, Johnny	12/22/2016	Proposed		See Program Plan, Implement stage gating and daily PM processes, Implement Governance	Phase 1	Very High	Delivery	High Level Design
Johnston, Johnny	03/01/2016	Medium	Very High	Unplanned/unscheduled changes to scope can drive program costs, impact timely delivery or compromise the quality of program outcomes	- Mitigation: Build scope around business case manage changes against baseline, report spending, coordinate the CPP initiatives	Johnston, Johnny	12/22/2016	Solution		- Mitigation: Build scope around business case, manage changes against baseline, report spending, coordinate the CPP initiatives	Phase 1	Very High	Delivery	High Level Design

nationalgrid

An Integrated program has been developed and subject to final detailed planning with our partners can be base-lined



Legend: ◆ Key Milestone ▲ Key Meetings ■ Planned workstream

Agile Field Pilot: What we did...

Summary of Deliverables	Overview
<p>End-to-end collections process built in Salesforce Field Service Console and Salesforce 1 mobile application over three, <u>two week</u> Agile sprints:</p>  <p>Agile Method ©2015 HubSpot Inc.</p> <p>Specifics</p> <ul style="list-style-type: none"> ■ Integration of CSS meter data with Salesforce platform ■ Configured a dispatcher console ■ Built and enhanced a custom National Grid mobile application ■ Built multiple dashboards and reports ■ Deployed iPad/iPhone devices 	<p>Pilot Development Duration:</p> <ul style="list-style-type: none"> ■ 198 development hours ■ 84 project manager hours <p>Resources:</p> <ul style="list-style-type: none"> ■ 3 Developers ■ 1 Scrum Master ■ 1 Project Manager ■ 1 Product Owner (Paula) ■ 4 Testers (Collections) ■ 1 Subject Matter Expert (Phil) <p>Requirements</p> <ul style="list-style-type: none"> ■ Completed: 123 ■ Backlog: 14



Agile Field Pilot: How it went...

- "I love it" – Field Tech
- "We really like being involved, we feel like we are being heard" – Field Tech
- "Impressive" – Field Tech
- "I love how you can see what they are doing in the field real-time" – Dispatchers
- "The voice to text is absolutely amazing – please give us this iPad!" – Field Tech
- "It's so much more intuitive compared to MDSI – glad to see we are finally being innovative" - Field Tech



Day 1 (Existing Solution)		Day 2 (New Solution)		
Jobs Assigned	73	Assigned Jobs	109	↑
Completed*	61	Completed*	58	↑
Travel Time	15 minutes	Travel Time	6 minutes	↓
Job Duration	9 minutes	Job Duration	8 minutes	↓

*Time Cutoff: 330pm

*Time Cutoff: 100pm





Retrospective Deep Dive Feedback

Positive Feedback	Improvement Feedback
<p>Agile Process:</p> <ul style="list-style-type: none">■ Feedback is taken into consideration (field, dispatch) and implemented swiftly <p>Hardware:</p> <ul style="list-style-type: none">■ Mobility – ability to take the iPad/iPhone platform out of the truck■ Ability to take pictures – document findings and picture of meter■ Ability to perform voice to text (for field notes)■ Connectivity – better connectivity with iPad vs. the Toughbook <p>Software Application Platform:</p> <ul style="list-style-type: none">■ Mobile app is easy to use and intuitive■ Aid with route optimization■ Incentive dashboard■ Ability to see work performance real-time■ Voice turn notifications■ Free form fields for notes that are not limited	<p>Agile Process:</p> <ul style="list-style-type: none">■ Want to be involved even more moving forward, would prefer daily Scrums as compared to weekly■ Involve Field Techs and Dispatchers even earlier <p>Hardware:</p> <ul style="list-style-type: none">■ Need mobile printing abilities – currently takes 5 minutes or more to write door tag■ Need mobile credit card reader – takes too long to take a credit card■ Real-time traffic information and street level optimization will further efficiencies <p>Software Application Platform:</p> <ul style="list-style-type: none">■ Need to work on routing abilities w/ more business logic – jobs too far apart■ Apartments should be targeted first (even if they are not prioritized)

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Steering Group Pack



Johnny Johnston

24 October 2016 @ 0900 EST, Res Woods E1-938 Latimer



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900 - 0905	JJ
Action Item Follow Up	0905 - 0910	KH
Current and Future State Design – Highlights	0910 - 0925	JJ / RIF
Software Solution Approach and RFI Highlights	0925 - 0940	JJ / CM
Business Case Preparation <ul style="list-style-type: none">• Approach• Benefits types and benchmarks• Options to be evaluated	0940 - 1010	JJ
Program Status	1010 -1015	KH
Business Assurance Partner Update	1015 -1025	CF
Meeting Close & Feedback	1025 -1030	JJ



Meeting Objectives

1. Provide an overview of the business case development process to obtain Steering Group feedback, input and endorsement
2. Review software solution activities supporting business case and initiative planning to obtain Steering Group insight and perspective
3. Review As / Is and Future State Design highlights



Action Item Follow Up

	Action	Owner	Assigned	Due	Comment	Complete?
3	To identify the appropriate approach to ensure that the SG has visibility to the level of customization being undertaken by the project.	JJ	10 Mar 16	1 Oct16	Phase 1: <ul style="list-style-type: none"> Formalize the design principle to minimize, customizations Provide a view of where customizations might be required in Phase 2 based on what we know. Phase 2: <ul style="list-style-type: none"> All customizations will be approved by Chris Murphy and Johnny Johnston and formally reported to the Steering Group. 	Pending
5	Advise SG on Powerplan solution options impacting the Program	JJ	5 May 16	Nov 16	GE, in partnership with Finance, to sponsor study to identify plan, timings and costs to re-architect the integration of SAP / PowerPlan / Front Office	Pending
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Dan Glenning / KC coordinating workshop for late Oct , early Nov to discuss lessons learned	Pending

4

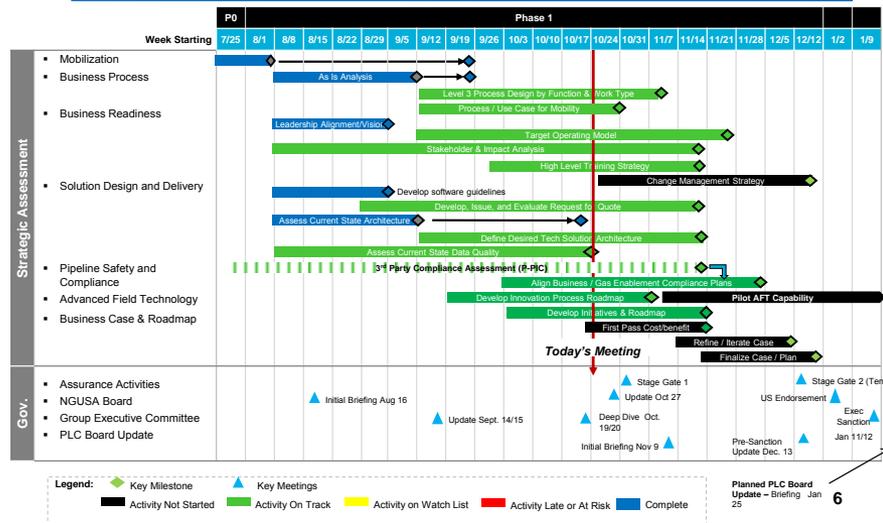


Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900 - 0905	JJ
Action Item Follow Up	0905 - 0910	KH
Current and Future State Design – Highlights	0910 - 0925	JJ / RIF
Software Solution Approach and RFI Highlights	0925 - 0940	JJ / CM
Business Case Preparation <ul style="list-style-type: none">• Approach• Benefits types and benchmarks• Options to be evaluated	0940 - 1010	JJ
Program Status	1010 -1015	KH
Business Assurance Partner Update	1015 -1025	CF
Meeting Close & Feedback	1025 -1030	JJ



Program Plan – As Is / To Be activities are completing while business case preparation ramps up as planned





Business Process Design: “To Be” Design Workshops

The future state design workshops will be completed in the next week. The workshops will be completed over a seven week period with business SME’s engaging with core process teams consisting of National Grid and Accenture.

- Work & Contractor Management
- Customer Experience
- Asset Management
- Data Management

Workshop Success Factors	Outcomes	Workshop Schedule							
		Week	Day	Location	Monday	Tuesday	Wednesday	Thursday	Friday
Level of Engagement	<ul style="list-style-type: none"> High level of engagement with approx. 200 management employees attending 14 workshops. Survey results point to high confidence numbers from participants averaging greater than 80% agreement on all questions. 	8	Mo	Waltham, MA	Prep & Document	Work Initiation		Planning & Document	Prep & Document
		8	Mo	Waltham, MA	Prep & Document	Asset Plan, Mgmt / Asset Needs Ident.	Asset Planning / Mgmt.	Prep & Document	Prep & Document
		9	Mo	Waltham, MA	Prep & Document		Prep & Document	Material Mgmt.	Prep & Document
		9	Mo	Waltham, MA	Prep & Document	Grid/CI/CI State Construction	Design/Operate (Include CI)	Asset Portfolio & Risk Mgmt.	Prep & Document
		10	Mo	Waltham, MA	Prep & Document			Schedule & Outreach	Prep & Document
Organizational Outreach	<ul style="list-style-type: none"> Workshops conducted in New York and New England with 27 organizations participating. Represented employee workshops scheduled for Oct 25th, 27th and Nov 2nd. 	10	Mo	Waltham, MA	Prep & Document	Prep & Document	Asset Information Management / CI / Mgmt.	Prep & Document	
		11	Mo	Waltham, MA	Prep & Document	Work Item / Work Item / Transition	Work Closure (Asset Financial Accounting)	Prep & Document	Prep & Document
		12	Mo	Waltham, MA	Prep & Document		Customer Experience	End-to-End 1	Deliverable Prep
		12	Mo	Waltham, MA	Prep & Document	Data Management	Prep & Document	Prep & Document	Deliverable Prep
Relevant Data Collection	<ul style="list-style-type: none"> Over 500 requirements collected 150 key business decisions raised The team is refining and categorizing information for review and approval by the Leadership Team. 	12	Mo	Waltham, MA	Deliverable Prep	Customer Mgmt / Representative Eng.	Prep & Document	Asset Engage / Representative Eng.	Deliverable Prep
		13	Mo	Waltham, MA	Deliverable Prep	Deliverable Prep	Prep & Document	Prep & Document	Deliverable Prep
		13	Mo	Waltham, MA	Deliverable Prep	Deliverable Prep	System Mgmt / Documented Eng.	Prep & Document	Deliverable Prep



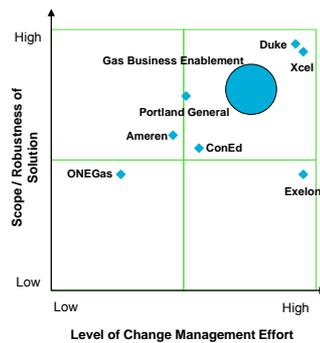
From Here to There

	Today		Tomorrow
Customer	<ul style="list-style-type: none"> • High % of Commitments Not Met • Limited Channels / Self-Service Tools • Inflexible Appointment Options • Minimal Visibility to Work Status • Fragmented Customer Communications 		<ul style="list-style-type: none"> • 95+% of all Commitments Met • Full Suite of Self-Service Tools Available • Channels Meet Customer Needs (e.g., Apps) • After Work and Weekend Appointment Options • Full Visibility to Work Status • Consistent Customer Communications
People	<ul style="list-style-type: none"> • Culture of "Make Do" • Typical Performance Measurement • Roles that Overlap and Drive Duplicative Responsibilities 		<ul style="list-style-type: none"> • Culture of Accountability • Performance Tied to Outcomes • Rationalized Roles and Responsibilities for Specialization
Process & Data	<ul style="list-style-type: none"> • Process Ownership • Inconsistency of Processes • Policies and Methods Not Followed • Conflicting Sources of Data • Information Locked in Expert Minds 		<ul style="list-style-type: none"> • Process AND Data Ownership • Optimized and Standardized Processes • Exception Management Driving Adherence • Single Source of the Truth • Information Available to All at Point of Need
Technology	<ul style="list-style-type: none"> • Manual, Paper-Based Data Collection • Solutions Disconnected • Long Lead Times to Enhance Capabilities • Antiquated Delivery Methods 		<ul style="list-style-type: none"> • Automated and On-line Data Capture • Fully Integrated Solution Architecture • Swifter, More Efficient Enhancement Engines • World Class Delivery Methods and Capabilities



Peer Utility Programs

■ Solution Scope & Robustness vs. Level of Change Effort



Key Points

- Duke and Xcel had the broadest program in terms of solution scope and robustness and spent heavily on change management effort to ensure adoption and sustainment
- Although Exelon had a much more narrow program solution scope and robustness, it also spent heavily on change management to ensure adoption and sustainment
- Duke, Xcel, and Exelon did the basics including training, and communication but also included change enablement to build the capability to drive the change, organization design and transition, and a significant effort with respect to building performance management
- ONE Gas and Ameren did more of the basics with respect to change management – training, communications, etc.
- Portland General had a broad program but spent modestly on change management
- ConEd had an average program in terms of solution scope and spent slightly more than the Ameren and Portland General on change management



The Big Opportunity

We are proud of what we do.

However, we are all frustrated – and the way we work doesn't meet our employees', customers' and regulators' expectations, putting our future growth at risk.

It's our time to fix it and make changes – through employee-driven solutions to deliver industry-leading performance.

We are committed to invest in our business to unlock our passion and potential to build trust among ourselves, and with our customers, communities and regulators.

Our Service Territory offers the greatest opportunity for growth. We have talented people who have permission to act. Working together we will fix today and enable tomorrow.



Result Accelerators

1. Improve Onboarding
2. Field Device Replacement and Repair
3. Reduce Mapping Cycle Time
4. Use of Handheld Device for Mapping or Procedures

Solution Design and Delivery: Current state analysis highlight observations and activity

- The U.S. Gas Enablement program will replace at least ~84% (99 of 117¹) of the application and technology footprint for U.S. Gas Operations.
- A Significant amount of the application portfolio and data sources ~59% (69 of 117) applications are currently unsupported (e.g. by IS or a supplier etc...)
- Investments will have to be made in terms of enabling capabilities that will: industrialize/scale agile delivery; provide effective monitoring of extended eco-system (Cloud Solutions); secure mobile devices; standardize the integration and security architecture for external SaaS based solutions.
- Advanced analytics capabilities and architecture may be leveraged by Gas Enablement and complemented by Big Data solutions, however several step-wise improvements in Enterprise Information Management will be necessary to mitigate development and operations risks due to existing data quality.
- Future State Info/App/Integration Architecture underway
- Software Solution RFI responses received and being analyzed
 - Balance between traditional and innovation under evaluation

1-Application Count for U.S. Gas Operations is 158: including 15 modules of SAP and 26 Applications that are out of scope. 99 Applications have dispositions as "replace", 14 Applications as Integrations, 4 are unknown and need a final disposition. 158-15-26=117.



With the completion of the Stopped Meter Pilot in Upstate NY, our technology pilot has come to a successful conclusion

Overview

- **Process**
 - 2 Agile Development Sprints
 - 2 In-Depth Workshops
 - 1 Sprint Review
 - 1 Conference Room Pilot
- **Results:**
 - New standard process demonstrated using modern software and hardware
 - Field techs loved the iPad device and ability to txt and take pictures but want mobile printing capability
 - Participants like the application platform and some of its built in communication capability between field and dispatcher
 - High praise for the Agile process due to the immediacy of feedback and correction but it was acknowledged that it is a big commitment





Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900 - 0905	JJ
Action Item Follow Up	0905 - 0910	KH
Current and Future State Design – Highlights	0910 - 0925	JJ / RIF
Software Solution Approach and RFI Highlights	0925 - 0940	JJ / CM
Business Case Preparation <ul style="list-style-type: none">• Approach• Benefits types and benchmarks• Options to be evaluated	0940 - 1010	JJ
Program Status	1010 -1015	KH
Business Assurance Partner Update	1015 -1025	CF
Meeting Close & Feedback	1025 -1030	JJ



Assessed nine software categories for solutioning

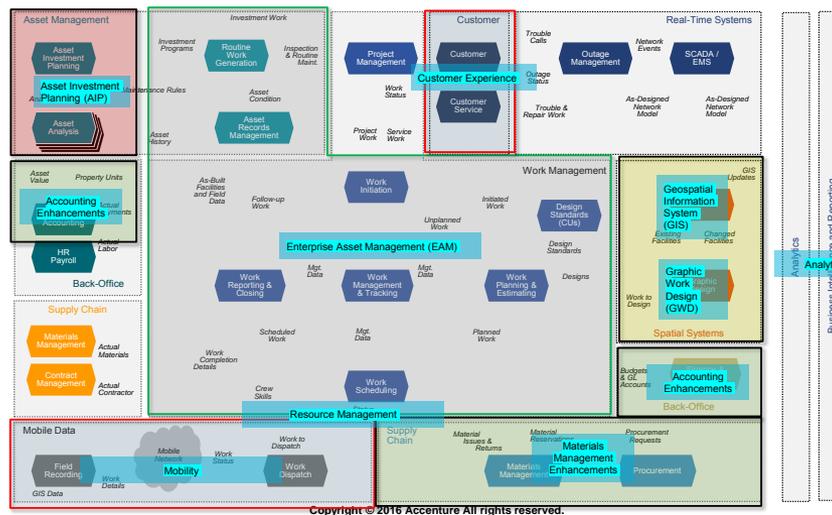
	Enterprise Asset Management (EAM)	Consolidate all asset data and track construction, maintenance and inspection work on the network.
	Resource Management	Ensure optimal utilization of resources by forecasting, planning, scheduling, dispatching and monitoring field work
	Mobility	Provide field workers a platform to receive, document and close the work assigned to them.
	Geospatial Information System (GIS)	Document the location of all assets and leaks on the network.
	Graphic Work Design	Electronically design new and modified segments of the network for future construction activities.
	Asset Investment Planning (AIP)	Ensure the right investments are made on the right assets to effectively reduce risk.
	Integrity Management	Accurately identify and evaluate asset and operational risks to mitigate them.
	Analytics	Leverage asset, work and customer data to improve all aspects of the business.
	Customer Experience	Provide a service to customer that facilitate their interactions with the utility.
	Customer Telephony	Use telephony to improve communication channels between the customer and the utility.

15

Currently parallel investments



Logical Architecture – Key Solutions Focus





Blend of Traditional and Innovation Options Under Review

- Traditional solutions implemented by many utilities exist for all categories
- We are actively evaluating options for the inclusion of emerging players that offer significant upside potential
- An example is Salesforce's Field Service Lightning Platform which could offer benefit in Resource Management, Mobility and Customer Experience especially for short-cycle (customer-related) work types

	Enterprise Asset Management (EAM)	Consolidate all asset data and track construction, maintenance and inspection work on the network.
	Resource Management	Ensure optimal utilization of resources by forecasting, planning, scheduling, dispatching & monitoring field work
	Mobility	Provide field workers a platform to receive, document and close the work assigned to them.
	Geospatial Information System (GIS)	Document the location of all assets and leaks on the network.
	Graphic Work Design	Electronically design new and modified segments of the network for future construction activities.
	Asset Investment Planning (AIP)	Ensure the right investments are made on the right assets to effectively reduce risk.
	Integrity Management	Accurately identify and evaluate asset and operational risks to mitigate them.
	Analytics	Leverage asset, work and customer data to improve all aspects of the business.
	Customer Experience	Provide a service to customer that facilitate their interactions with the utility.
	Customer Telephony	Use telephony to improve communication channels between the customer and the utility.

17

Currently parallel investments



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900 - 0905	JJ
Action Item Follow Up	0905 - 0910	KH
Current and Future State Design – Highlights	0910 - 0925	JJ / RIF
Software Solution Approach and RFI Highlights	0925 - 0940	JJ / CM
Business Case Preparation <ul style="list-style-type: none"> • Approach • Benefits types and benchmarks • Options to be evaluated 	0940 - 1010	JJ
Program Status	1010 -1015	KH
Business Assurance Partner Update	1015 -1025	CF
Meeting Close & Feedback	1025 -1030	JJ

CONFIDENTIAL



Cost Estimating

- Costs will be estimated for all Gas Enablement initiatives

- Initiatives will be estimated using Accenture's Development Methods estimators which cover people (e.g., change management), process, and technology and result in a standard resource plan on which labor costs will be calculated

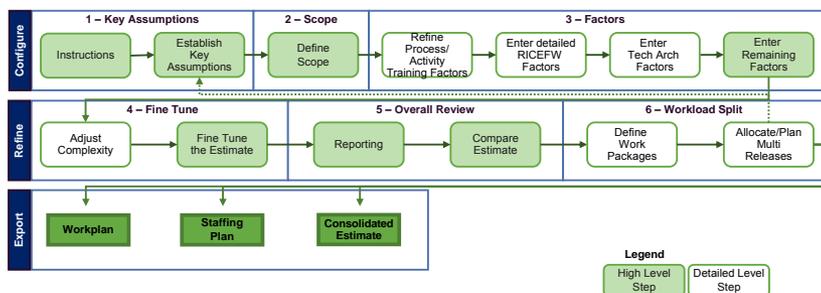
- Key Estimating Inputs
 - Investment Costs
 - Labor Cost (internal, external)
 - Software License Cost
 - Hardware Cost
 - Legacy Remediation Cost
 - Ongoing Support Costs
 - Labor Cost (internal, external)
 - Software License Maintenance Cost

- Software and hardware estimates will use vendor quoted prices where possible

CONFIDENTIAL



Accenture Estimating Model Approach



CONFIDENTIAL



Benefit Estimating / Identification

- Benefits will be estimated / identified for all Gas Enablement initiatives

- 4 types of benefits will be identified
 - Type 1: Tangible; direct linkage to costs removed from the business or \$ taken out of budgets; examples include eliminating work activities through automation, reduction in material costs through improved contract purchasing power
 - Type 2: Tangible / aspirational; benefits are driven by KPIs vs. \$ taken out of budgets; once KPI targets are achieved, decisions to take \$ out of budgets might be made; examples include cost avoidance such as avoided hiring, avoidance of fines, and productivity improvements
 - Type 3: Intangible; non-financial benefits that are measured directly by KPIs; examples include customer satisfaction, asset risk reduction, and safety
 - Type 4: Intangible; non-financial benefits that either can't be measured by KPIs or are measured indirectly; examples include culture changes, and goodwill

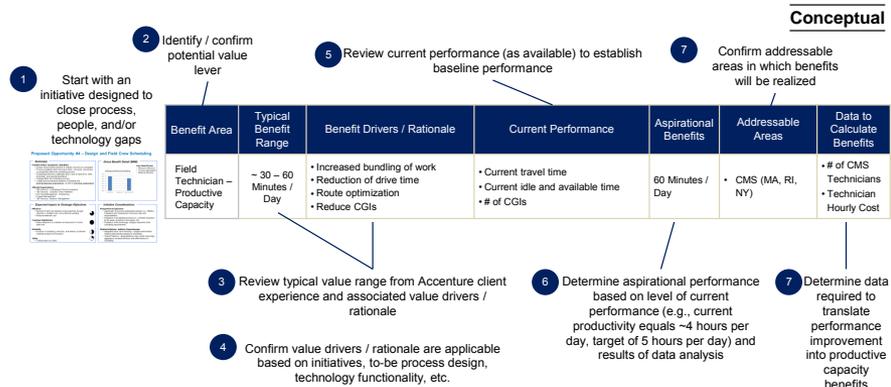
- Type 1 and Type 2 benefits will be estimated using Accenture benchmarks and previous client experience with similar initiatives as well as analysis of National Grid's current performance against the possible future state

- All benefits will be based on implementing requirements identified as part of the to-be workshops

CONFIDENTIAL

nationalgrid

Aspirational Benefit Estimating Approach – Type 2 Benefits



CONFIDENTIAL



Cost & Performance Benchmarks Example Benefit Areas (non-exhaustive) ¹

Example Benefit Area	Example Benefit Range	Benefit Drivers	
Field Productivity / Utilization	~10% to 67%	Reduce Drive Time	<ul style="list-style-type: none"> Reduce drive time due to optimized routing to jobs Reduce drive time due to optimized bundling of work
		Reduce Non-Productive Time	<ul style="list-style-type: none"> Reduce trips to "barn" to obtain information / additional work orders through use of electronic work packages Increase field crew / technician utilization through improved, more accurate scheduling – bundling, matching of skills to jobs, etc.
		Reduce Work Time	<ul style="list-style-type: none"> Reduce time spent searching for procedures, work methods, maps, etc. through use of electronic work packages Reduce time spent completing time cards through use of electronic time cards pre-populated based on daily schedule Reduce time spent initiating work orders through the use of pre-populated electronic forms and drop-down menus
		Reduce Truck Rolls	<ul style="list-style-type: none"> Reduce no parts on board, site not ready, and equipment not on site through improved prerequisite fulfillment
Field / Back Office Support Productivity / Utilization	~25% to 45%	Reduce / Eliminate Field Support Activities	<ul style="list-style-type: none"> Automated time card processing / manual intervention for exceptions only Eliminate time spent initiating paper work orders
Fleet Optimization	~15% to 30%	Reduce Fuel Consumption	<ul style="list-style-type: none"> Reduce fuel consumption through optimized routing to jobs Reduce fuel consumption due to false starts through improved prerequisite fulfillment
Damage Prevention	Varies	Reduce Locate Damages	<ul style="list-style-type: none"> Reduce # of damages as a result of locate errors through improved processes / better training
		Reduce Record Error Damages	<ul style="list-style-type: none"> Reduce # of damages as a result of record errors through improved data accuracy
Fine Avoidance	Varies	Reduce Commitments not met Fines	<ul style="list-style-type: none"> Increase the # of commitments met through improved scheduling, optimized routing to jobs, optimized bundling of work, and improved prerequisite fulfillment

¹ Actual benefits will depend on baseline performance, type of work, degree of change from current state to future state solution, etc.

Our strategic priority setting activities will shape the business case options to be evaluated

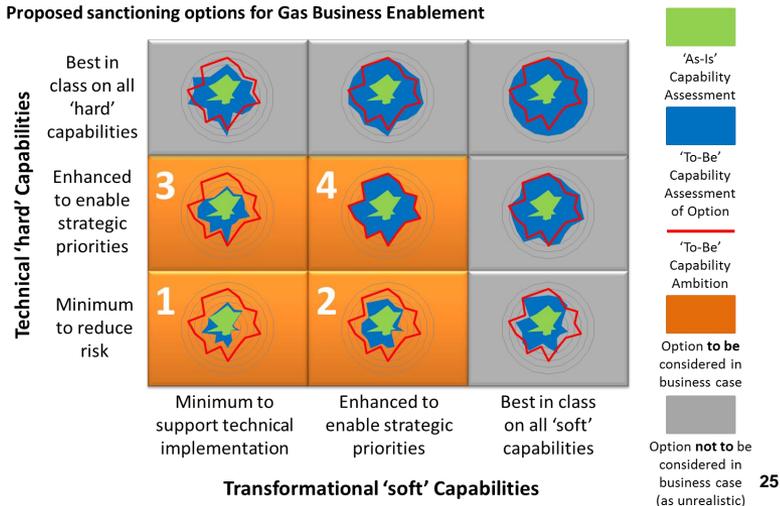


Gas Business Enablement Ambition vs Current State Analysis



While many options are possible, there are four which are most feasible in our environment

Proposed sanctioning options for Gas Business Enablement





Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	0900 - 0905	JJ
Action Item Follow Up	0905 - 0910	KH
Current and Future State Design – Highlights	0910 - 0925	JJ / RIF
Software Solution Approach and RFI Highlights	0925 - 0940	JJ / CM
Business Case Preparation <ul style="list-style-type: none"> • Approach • Benefits types and benchmarks • Options to be evaluated 	0940 - 1010	JJ
Program Status	1010 -1015	KH
Business Assurance Partner Update	1015 -1025	CF
Meeting Close & Feedback	1025 -1030	JJ



Gas Enablement Program Status

Scope Status And Impacts						Schedule Highlights																																															
<p>1) Scope Status: Three potential scope changes are being evaluated:</p> <ol style="list-style-type: none"> 1) Compliance – Field Training 2) Solution Design – Powerplan Architecture 3) Solution Design – Proactive Interface Build-out <p>2) Approves changes since last update:</p> <ol style="list-style-type: none"> 1) Augmented Business Readiness support <p>3) Next Scope "Infection Point": Completion of 3rd Party Compliance analysis 11/18</p> <p>4) Delivery Approach: Scheduling Agile methodology "deep dive" to support pending road map development activities</p> <p>5) Customization KPI (TBD)</p>						<p>1) Key Milestones and Deliverables:</p> <ol style="list-style-type: none"> 1) 4 of 20 Deliverables are complete - per plan 2) To Be Workshops to complete – 10/28 and 11/10 3) Current State Architecture Analysis completed - 10/19 4) New: GE Pipeline Compliance Strategy – 12/2 <p>2) Activities completed</p> <ol style="list-style-type: none"> 1) Compliance Integration Work shop #2 – 10/19 2) Albany "Accelerate" Event – 10/13-14 <p>3) Upcoming activities:</p> <ol style="list-style-type: none"> 1) Stage Gate 1 Go / No Go Decision – 11/1 2) Prepare first pass Business Case – 11/18 <p>4) Schedule status: Tracking to plan after approved revisions. Detailed critical path planning complete for next phase</p>																																															
Resources						Risk																																															
<table border="1"> <thead> <tr> <th>Staffing</th> <th>Plan</th> <th>Actual</th> <th>In-progress</th> <th>Open</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Wave 1</td> <td>39</td> <td>31</td> <td>8</td> <td></td> <td>→</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Finance / Budget Activity</th> <th>Status</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Program Budget Submitted</td> <td>●</td> <td>●</td> </tr> <tr> <td>Forecasted spend (against targets)</td> <td>●</td> <td>● Note 5</td> </tr> <tr> <td>Financial Reporting</td> <td>●</td> <td>●</td> </tr> </tbody> </table>						Staffing	Plan	Actual	In-progress	Open	Trend	Wave 1	39	31	8		→	Finance / Budget Activity	Status	Trend	Program Budget Submitted	●	●	Forecasted spend (against targets)	●	● Note 5	Financial Reporting	●	●	<table border="1"> <thead> <tr> <th colspan="4">Top Three Risks</th> </tr> <tr> <th>Risk</th> <th>Prob</th> <th>Impact</th> <th>Mitigation Status</th> </tr> </thead> <tbody> <tr> <td>Gaps in data and/or our understanding of quality and availability could impact planning and delivery</td> <td>High</td> <td>Very High</td> <td>Mitigation Plan Review 10/26</td> </tr> <tr> <td>The current PowerPlan solution architecture will not support transformed Gas Business platform & process</td> <td>High</td> <td>Very High</td> <td>Detailed planning activity being prepared to inform GE plans and business case</td> </tr> <tr> <td>Incomplete cross US enterprise integration could degrade roadmap viability</td> <td>Med</td> <td>High</td> <td>Integration activity meetings being expanded</td> </tr> </tbody> </table>				Top Three Risks				Risk	Prob	Impact	Mitigation Status	Gaps in data and/or our understanding of quality and availability could impact planning and delivery	High	Very High	Mitigation Plan Review 10/26	The current PowerPlan solution architecture will not support transformed Gas Business platform & process	High	Very High	Detailed planning activity being prepared to inform GE plans and business case	Incomplete cross US enterprise integration could degrade roadmap viability	Med	High	Integration activity meetings being expanded
Staffing	Plan	Actual	In-progress	Open	Trend																																																
Wave 1	39	31	8		→																																																
Finance / Budget Activity	Status	Trend																																																			
Program Budget Submitted	●	●																																																			
Forecasted spend (against targets)	●	● Note 5																																																			
Financial Reporting	●	●																																																			
Top Three Risks																																																					
Risk	Prob	Impact	Mitigation Status																																																		
Gaps in data and/or our understanding of quality and availability could impact planning and delivery	High	Very High	Mitigation Plan Review 10/26																																																		
The current PowerPlan solution architecture will not support transformed Gas Business platform & process	High	Very High	Detailed planning activity being prepared to inform GE plans and business case																																																		
Incomplete cross US enterprise integration could degrade roadmap viability	Med	High	Integration activity meetings being expanded																																																		
<p>1) Sufficient resources are onboard to successfully complete Ph1 however 5 role vacancies are will impact Phase 2 prep if they remain open for an extended period. Recruiting is active</p> <p>2) Wave 2 roles are being evaluated and prepared</p> <p>3) Budget variances remain favorable however refinement of Business vs Program compliance costs is still underway</p>						<p>1) Internal Assurance "Pulse Check" conducted 10/18 – follow up planned week 10/24</p>																																															



Strategic Assessment Review - PwC

■ Deliverables reviewed

- Current State Information Management, Application and Technology Architecture
- Current State structured and unstructured data analysis

To date we have reviewed 4 out of 20 deliverables;

Observations	Recommendations
1. Key design deliverables are delayed and bunching up – creating challenges on reviewer bandwidth and limited opportunity for remediation based on business assurance feedback"	Address significant bandwidth or matters arising from deliverable review as required
2. Much of the key project decision making is condensing into last 4-6 weeks of project which will impact quality and ability to iterate based on stakeholder feedback	Focus most attention on highest priority/impact items
3. Fluidity on technology decisions will impact estimation precision in areas such as integration requirements and Total Cost of Ownership (open decisions include core EAM, customer work management and scheduling / dispatch, mobile platform / application, capital projects and portfolio management)	Develop estimates for SAP and non-SAP (Maximo) core EAM applications; make valid assumptions on "seam" for SCM; create a thorough list of interfaces
4. Need to blend proven approaches and technology applications with innovation	Utilize a blend of conventional and agile methodology – there are only so many new things that can be accommodated in developing a plan with a high confidence level
5. More thorough data analysis is required given the size and importance of data remediation effort (primarily assets, GIS, customer records, material masters etc.)	Consider focused project to develop data management estimate. Data is one of the main opportunities and risks for this program and the business.

nationalgrid

Meeting close

- AOB
- New Action Item Summary
- Leadership Pulse Check and Closing Remarks

nationalgrid

Appendices





Steering Group Action Item List (complete)

	Action	Owner	Assigned	Due	Comment	Complete?
1	Ensure that Enablement is added to the QPR agenda	PS	10 Mar 16	1 Apr 16		Yes
2	To provide visibility of the expect impact of Gas Business enablement on the ability to run the business due to a potential talent drain.	JJ	10 Mar 16	1 May16	Phase 1 key roles have been filled with Business Leadership engagement and support. Subsequent staffing requirements will be reviewed regularly with the Design Authority	Aug 16 Yes
3	To identify the appropriate approach to ensure that the SG has visibility to the level of customization being undertaken by the project.	JJ	10 Mar 16	1 Oct16	Phase 1: <ul style="list-style-type: none"> Formalize the design principle to minimize, customizations Provide a view of where customizations might be required in Phase 2 based on what we know. Phase 2: <ul style="list-style-type: none"> All customizations will be approved by Chris Murphy and Johnny Johnston and formally reported to the Steering Group. 	Pending
4	To share the rate case strategy and ensure that any appropriate costs are included in the MA Gas rate case.	JJ	10 Mar 16	1 Jul 16	Action Plan: 1) Engaging with NY rate case team 2) Coordinating with MA to include GE costs in the MA Gas case 3) Will work with Finance to deploy effective tools and processes to capture and report rate case data 4) Insure GE business case is rate case enabling	Aug 16
5	Advise SG on Powerplan solution options impacting the Program	JJ	5 May 16	Nov 16	GE, in partnership with Finance, to sponsor study to identify plan, timings and costs to re-architect the integration of SAP / PowerPlan / Front Office	pending
6	Review GBE Scope with Finance Remediation	KH	5 May 16	June 16	Rescheduled by Fin – working with RQ for new date	9/14



Action Items - continued

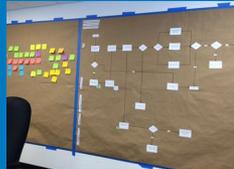
	Action	Owner	Assigned	Due	Comment	Complete?
7	Add controls development to design phase success criteria	KH	5 May 16	June 16		Yes
8	Update the SG on proposal detail and procurement process status and selection criteria	JJ	5 May 16	June 16		Yes
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Pending completion of CWIP Analysis	Proj Aug 16
10	Invite Internal Assurance to participate in vendor oral presentations and proposal review	KC	24 June 16	July 16	Complete – Input received	Yes
11	Provide a follow-up on staffing progress and plans	JJ	1 Aug 16	23 Aug 16	Complete	8/23

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Steering Group Pack



Johnny Johnston

2 Dec 2016 @ 1200 EST, Res Woods – E3.903 Curie Conference Room



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>	
Opening Remarks / Meeting Objectives	(12:00) 10 min	JJ	
Action Item Follow Up	5 min	KH	
Program Status	5 min	KH	
Technical Solution Updates: Software selection (NG Only)	10 min	CM	
PowerPlan Recommendations (NG Only)	10 min	CM	
Business Assurance Partner Update	10 min	CF	
Business Case and Roadmap Development	50 min	JJ / SJ	
<ul style="list-style-type: none"> • Scope, Context, Roadmap • Business Case 			
Executive Approval and Sanctioning Process	15 min	JJ	
Meeting Close & Feedback	5 min (14:00)	JJ	2



Meeting Objectives

1. Gain Steering Group input and guidance as to how we should consider our approach to preparing the final business case and road map for sanctioning
2. Gain Steering Group approval of our approach to software procurement
3. Gain Steering Group approval of our recommendations for re-architecture of the Front Office – Powerplan – SAP interface



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	(12:00) 10 min	JJ
Action Item Follow Up	5 min	KH
Program Status	5 min	KH
Technical Solution Updates: Software selection (NG Only)	10 min	CM
PowerPlan Recommendations (NG Only)	10 min	CM
Business Assurance Partner Update	10 min	CF
Business Case and Roadmap Development	50 min	JJ / SJ
<ul style="list-style-type: none"> • Scope, Context, Roadmap • Business Case 		
Executive Approval and Sanctioning Process	15 min	JJ
Meeting Close & Feedback	5 min (14:00)	JJ

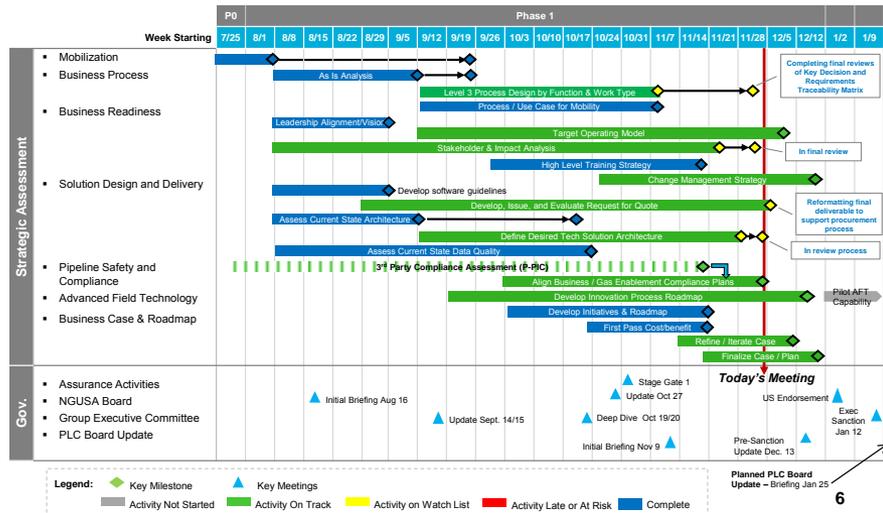


Action Item Follow Up

	Action	Owner	Assigned	Due	Comment	Complete?
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	<ul style="list-style-type: none">Gas Enablement will participate in Nov 30 / Dec 1 Work Order Remediation WorkshopsLessons Learned Discussion scheduled for 12/1	Pending

nationalgrid

We are tracking to on-time completion, however some deliverable reviews are closing more slowly than planned





Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	(12:00) 10 min	JJ
Action Item Follow Up	5 min	KH
Program Status	5 min	KH
Technical Solution Updates: Software selection (NG Only)	10 min	CM
PowerPlan Recommendations (NG Only)	10 min	CM
Business Assurance Partner Update	10 min	CF
Business Case and Roadmap Development	50 min	JJ / SJ
<ul style="list-style-type: none"> • Scope, Context, Roadmap • Business Case 		
Executive Approval and Sanctioning Process	15 min	JJ
Meeting Close & Feedback	5 min (14:00)	JJ



Gas Enablement Program Status

Scope Status And Impacts					Schedule Highlights																																													
<p>1) Scope Status: Multiple potential scope changes are being evaluated:</p> <ol style="list-style-type: none"> 1) Solution Design – Proactive Interface Build-out 2) Phase 2 “Accelerators” - Various <p>2) Approved changes since last update:</p> <ol style="list-style-type: none"> 1) Compliance – Field Training 2) Solution Design – Powerplan Architecture 3) Supply Chain Integration <p>3) Next Scope “Infection Point”: Phase 2 Mobilization “Accelerator” analysis W/B 12/5</p> <p>4) Delivery Approach: Being addressed as part of Road Map and Business Case preparation</p> <p>5) Customization KPI: To be developed in Phase 2 Mobilization</p>					<p>1) Key Milestones and Deliverables:</p> <ol style="list-style-type: none"> 1) 5 of 22 Deliverables are complete, 6 are in the review/ approval process with 11 in the build phase. Projected completion – 12/16 per plan 2) GE Pipeline Compliance Strategy – 12/2 3) Road Map / Business Case refinement underway <p>2) Activities completed</p> <ol style="list-style-type: none"> 1) Stage Gate 1 Go / No Go Decision: “Go” on 11/1 2) First Pass Roadmap / Business case walk through 11/21 <p>3) Upcoming activities: Prepare Board and Sanction Papers, Prepare work packets for Phase 2 System Integrator(s)</p> <p>4) Overall Schedule Status: Tracking to revised plan however some Deliverables are lagging in completion of final reviews</p>																																													
Resources					Risk																																													
<table border="1"> <thead> <tr> <th>Staffing</th> <th>Plan</th> <th>Actual</th> <th>In-progress</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Wave 1/2/3</td> <td>51</td> <td>32</td> <td>31*</td> <td></td> </tr> </tbody> </table> <p>* In Progress – includes all positions to complete remaining Wave 2 and 3 requirements through March</p> <table border="1"> <thead> <tr> <th>Finance / Budget Activity</th> <th>Status</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Program Budget Submitted</td> <td></td> <td></td> </tr> <tr> <td>Forecasted spend (against targets)</td> <td></td> <td></td> </tr> <tr> <td>Financial Reporting</td> <td></td> <td></td> </tr> </tbody> </table> <ol style="list-style-type: none"> 1) Opened all Process Req. roles for recruiting, GBE is actively working with PEX to obtain 8-10 current practitioners 2) Part of the in-progress numbers are 10 offers issued and accepted with start dates in December 3) Forecast Spend – currently trending to come in at or slightly below budget 4) Financial Reporting – producing monthly reporting on actual, budget, and forecast 					Staffing	Plan	Actual	In-progress	Trend	Wave 1/2/3	51	32	31*		Finance / Budget Activity	Status	Trend	Program Budget Submitted			Forecasted spend (against targets)			Financial Reporting			<table border="1"> <thead> <tr> <th colspan="4">Top Three Risks</th> </tr> <tr> <th>Risk</th> <th>Prob</th> <th>Impact</th> <th>Mitigation Status</th> </tr> </thead> <tbody> <tr> <td>Gaps in data and/or our understanding of quality and availability could impact planning and delivery</td> <td>High</td> <td>Very High</td> <td>Data exploration, profiling, and modeling under way to ensure availability and quality</td> </tr> <tr> <td>The current PowerPlan solution architecture will not support transformed Gas Business platform & process</td> <td>High</td> <td>Very High</td> <td>This risk has been mitigated</td> </tr> <tr> <td>Incomplete cross US enterprise integration could degrade roadmap viability</td> <td>Med</td> <td>High</td> <td>Integration activity meetings being expanded</td> </tr> </tbody> </table> <ol style="list-style-type: none"> 1) Planning Enterprise / Program risk process coordination activities to begin in January 				Top Three Risks				Risk	Prob	Impact	Mitigation Status	Gaps in data and/or our understanding of quality and availability could impact planning and delivery	High	Very High	Data exploration, profiling, and modeling under way to ensure availability and quality	The current PowerPlan solution architecture will not support transformed Gas Business platform & process	High	Very High	This risk has been mitigated	Incomplete cross US enterprise integration could degrade roadmap viability	Med	High	Integration activity meetings being expanded
Staffing	Plan	Actual	In-progress	Trend																																														
Wave 1/2/3	51	32	31*																																															
Finance / Budget Activity	Status	Trend																																																
Program Budget Submitted																																																		
Forecasted spend (against targets)																																																		
Financial Reporting																																																		
Top Three Risks																																																		
Risk	Prob	Impact	Mitigation Status																																															
Gaps in data and/or our understanding of quality and availability could impact planning and delivery	High	Very High	Data exploration, profiling, and modeling under way to ensure availability and quality																																															
The current PowerPlan solution architecture will not support transformed Gas Business platform & process	High	Very High	This risk has been mitigated																																															
Incomplete cross US enterprise integration could degrade roadmap viability	Med	High	Integration activity meetings being expanded																																															



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	(12:00) 10 min	JJ
Action Item Follow Up	5 min	KH
Program Status	5 min	KH
Technical Solution Updates: Software selection (NG Only)	10 min	CM
PowerPlan Recommendations (NG Only)	10 min	CM
Business Assurance Partner Update	10 min	CF
Business Case and Roadmap Development	50 min	JJ / SJ
<ul style="list-style-type: none"> • Scope, Context, Roadmap • Business Case 		
Executive Approval and Sanctioning Process	15 min	JJ
Meeting Close & Feedback	5 min (14:00)	JJ



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>	
Opening Remarks / Meeting Objectives	(12:00) 10 min	JJ	
Action Item Follow Up	5 min	KH	
Program Status	5 min	KH	
Technical Solution Updates: Software selection (NG Only)	10 min	CM	
PowerPlan Recommendations (NG Only)	10 min	CM	
Business Assurance Partner Update	10 min	CF	
Business Case and Roadmap Development	50 min	JJ / SJ	
<ul style="list-style-type: none"> • Scope, Context, Roadmap • Business Case 			
Executive Approval and Sanctioning Process	15 min	JJ	
Meeting Close & Feedback	5 min (14:00)	JJ	10



Key Observations

■ Deliverables reviewed

- High Level Business Requirements
- Key Business and Technical Decisions Inventory
- Processes and Key Use Cases for Connected and Disconnected Mobility
- Future-state information, application, and integration architecture (draft)
- Change Impact Analysis
- Application and technology roadmap including enabling capabilities (draft)

Observations	Recommendations
Detailed Observations on Design and Roadmap on following slides	



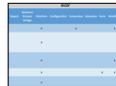
Design

Key Findings

Through the BA reviews, gaps in the quality and completeness of the Design deliverables were identified and not fully addressed:

The **Pain Point and Opportunity Analysis** did not:

1. Bridge the gap from current to desired state
2. Identify industry best practices and tools
3. Cross reference pain points to provide a pivot to the future state



The **High Level Business Requirements** had extensive gaps including:

1. An incomplete inventory missing many important capabilities to support various work types
2. Missing industry best practice requirements
3. The majority of RICEFW categorizations were incorrectly assigned, which will impact cost calculation

The **Level 3 Business Process Flows** have gaps including:

1. No clear inventory or decomposition of level 1, level 2 and level 3 flows
2. No variations illustrated across different work types
3. No link between process steps and related business requirements that support them
4. No swim lanes / roles or visual representation of system interaction
5. Asset Management capabilities do not have detail flows
6. Capital Projects and Portfolio Management capabilities and process flows are not defined



The **Key Business Decision Inventory** has gaps including:

1. Several KBDs require more supporting documentation than is available in the inventory itself
2. Several KBDs were identified where it appeared that further analysis (is) required before determining the approach/consensus
3. Over 20 additional KBDs identified for addition

Implications

The outstanding gaps and shortcomings identified in the design deliverables **do not** prevent development of the roadmap and business case (apart from fuzziness on initiative scope)

The main impact will be on National Grid's ability to issue clearly defined RFP's for software selection and system integration services – a solid set of future state design specifications are required for precise scoping

Recommended Actions

Use Q1 2017 to perform a more detailed and thorough development of Level 3 process flows and develop appropriate linkages to requirements and pain points – **focusing on Core Scope first**



Roadmap

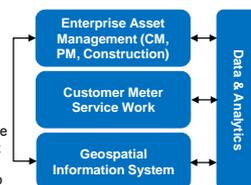
Key Findings

While not fully completed, the initial draft Roadmap has been reviewed and the following conclusions have been drawn to date:

1. The roadmap is comprehensive and provides a large number of initiatives and activities to perform over a four year period.
2. An excess of work and scope is included in the first 3-4 years of the program. This distracts from the main priority of **implementing core scope across the jurisdictions (3+5 model)**. Loses focus on driving the value from getting the core capabilities "right" – and then adding more advanced capabilities from there.
3. Cost/effort estimate of Years 1-4 is bloated by high ratio of non-core scope
4. No clear linkage from the design elements into the roadmap i.e. mapping of capability/process inventory to initiatives. Unable to see which pain points/opportunities, requirements, and processes are enabled within each initiative on the roadmap.
5. The focus should be on foundational GBE scope to enable enterprise end-to-end work and asset management process through a highly integrated architecture (move the business onto a modern, integrated platform).



GBE Foundational/Core Scope



Implications

Creating a roadmap that is overly complex with too many moving parts will be difficult to manage and add risk.

Additionally, as this is a major program, it will be important that the focus of the organization is not pulled into too many directions during the early part of the program.

Recommended Actions

Use the remaining time in Q4 2016 to develop a robust plan to implement the core scope across all jurisdictions in ~3 years.



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>	
Opening Remarks / Meeting Objectives	(12:00) 10 min	JJ	
Action Item Follow Up	5 min	KH	
Program Status	5 min	KH	
Technical Solution Updates: Software selection (NG Only)	10 min	CM	
PowerPlan Recommendations (NG Only)	10 min	CM	
Business Assurance Partner Update	10 min	CF	
Business Case and Roadmap Development <ul style="list-style-type: none"> • Scope, Context, Roadmap • Business Case 	50 min	JJ / SJ	
Executive Approval and Sanctioning Process	15 min	JJ	
Meeting Close & Feedback	5 min (14:00)	JJ	14

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Business Case and Roadmap Development

November 2016

CONFIDENTIAL



The US Gas Business is facing a number of challenges today

We hold an unsustainable level of operational risk

- **Duplicate** and aging systems (117 applications vs ~20);
- 59% of our systems are **unsupported** by vendors
- Average **age** of system is 14 years (vs 5 ~ 7 industry norm)
- Underinvestment in infrastructure resulting in reduced **reliability** and increased **operational risk**

We need a step change in operational performance

- Operational performance and **compliance issues**
- Rising customer **expectations**
- Lack of **capacity** to respond to growth
- Diffuse **accountability** for operating performance
- Sustained under achievement of **ROE** (avg of 8.5% vs 9.7% allowed over last 3 years)

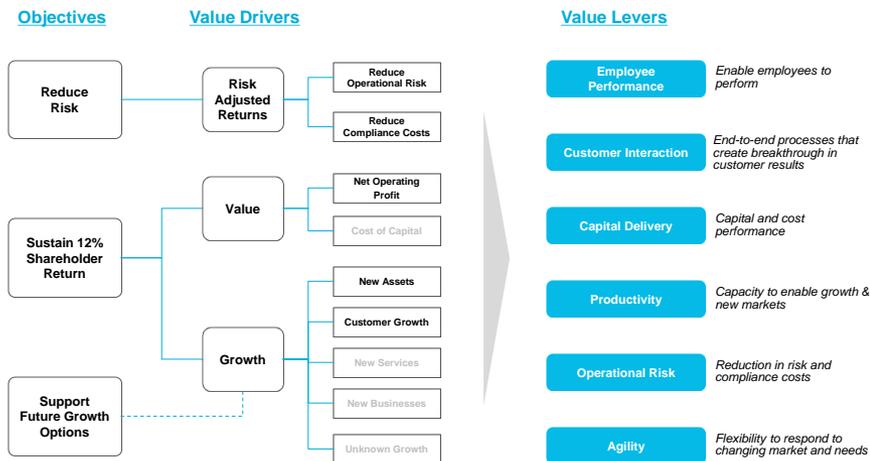
Our market framework is changing dramatically

- Rising regulatory **requirements** (e.g., API 1173)
- Changing public **sentiment** on gas (e.g., environmental)
- Competition and **opportunities** from alternative energy sources
- Transformative impact of **digital** on energy system

CONFIDENTIAL



There are three primary objectives for the program



CONFIDENTIAL



In the strategic assessment phase, we developed the following initiatives to meet these objectives

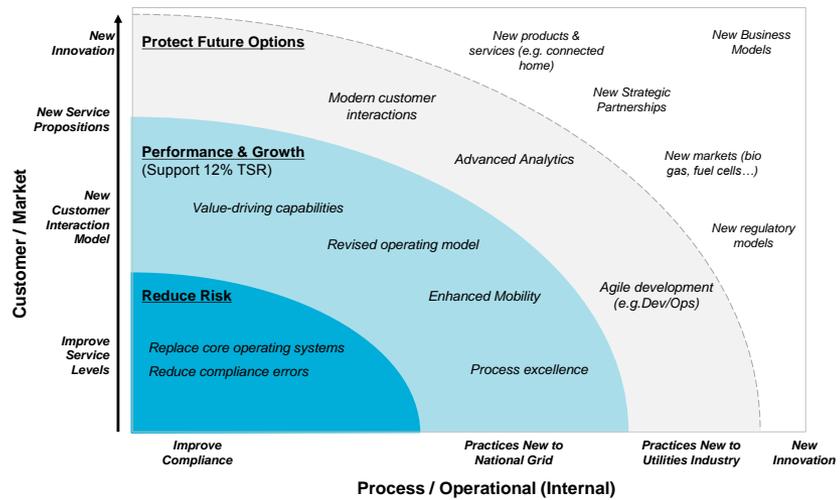
Workstreams	Initiatives						
	GBE Portfolio Management Office						
	Leadership Capability	Workforce Strategy Planning	Governance	Operations Performance	Program Level People Strategy	Program Business Readiness	Business Sustainment
Business Enablement							
Work Management	End-to-End Process Architecture (to L4)	Work Management and Field Enablement		Work Management Field Enablement - Advanced Analytics		Capital Projects & Program Management	
Asset Management	Asset Investment Planning and Management	Engineering, Design, Estimating & Mobility		Integrity Management		Asset - Advanced Analytics	
Customer Engagement	Internal Employee Portal (360 view of customer)	External Customer Portal		Channel Analytics		Campaign Effectiveness	
Data Management / Information Systems	Data Management & Governance	Data Quality & Cleansing	Remediation & Integration	Technology Initiatives (Infrastructure, Mobility COE)		Enabling Capabilities (Dev Ops, Testing COE)	
Regulatory/Compliance	Standards Operating Procedure Documentation			Document Management	Technical Field Training		
	Supply Chain						

18

CONFIDENTIAL



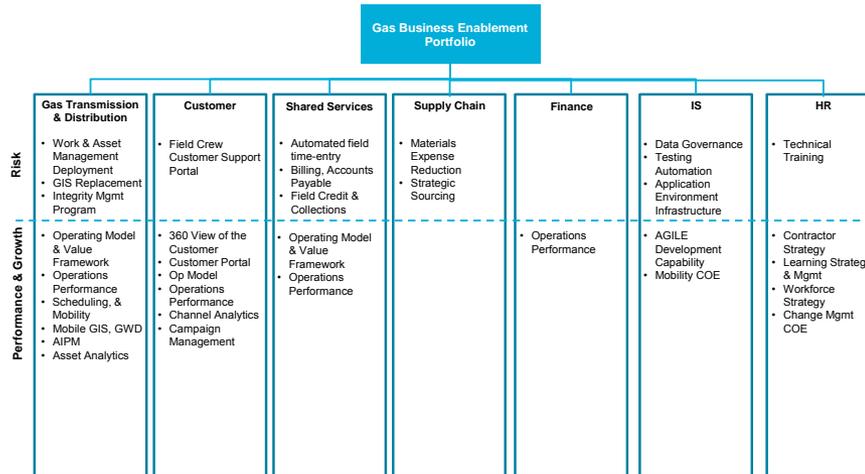
To help prioritization we can look at our initiatives and implementation approach with different lenses



CONFIDENTIAL



The initiatives span across a broad range of functions in the organization



CONFIDENTIAL



We assessed 3 different approaches to selection, prioritization and implementation of initiatives

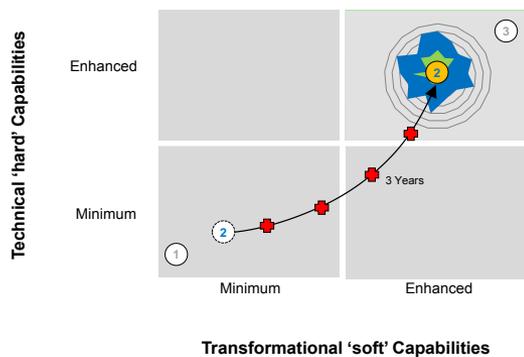
Option	Risk / Value Profile	Characteristics
1 Replacement "Minimalist" (\$200 to \$250m)		<ul style="list-style-type: none"> • Focused on replacing core platforms • Simplifies, reduces implementation and risk • Limited foundation for the future • Does not support desired TSR performance
2 Value Oriented "Optimized" (\$450-550m)		<ul style="list-style-type: none"> • Enhanced scope to meet program objectives • Prioritized investment 'waves' to deliver value • Extended deployment to manage deliverability • Landing points create optionality • Addresses risk and desired TSR performance
3 Full Portfolio "Big Bang" (\$600m+)		<ul style="list-style-type: none"> • Comprehensive platform & capability scope • Minimize deployment time creates delivery risk • Greater risk that desired performance improvements aren't achieved • Ambition outweighs capability to deliver

CONFIDENTIAL



The value-oriented approach is recommended as it provides the greatest balance between value, delivery risk & optionality

Value-Oriented Option



Hard Capabilities

- **Tools & Systems**
- **Business Processes**

Soft Capabilities

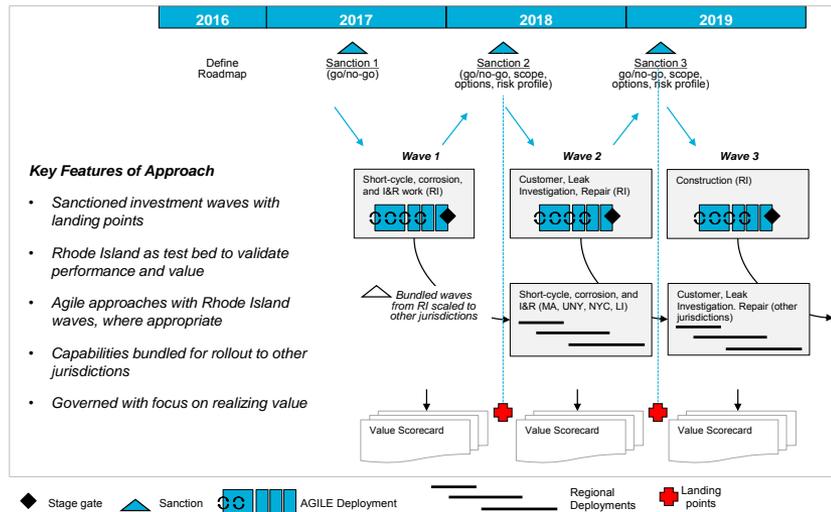
- **Operating Model**
 - Process orientation
 - Accountability and performance
 - Governance
 - Culture and behaviors
- **Learning & Talent**
- **Leadership Development**

Landing points
 'As-Is' Capability Assessment
 'To-Be' Capabilities

CONFIDENTIAL

nationalgrid

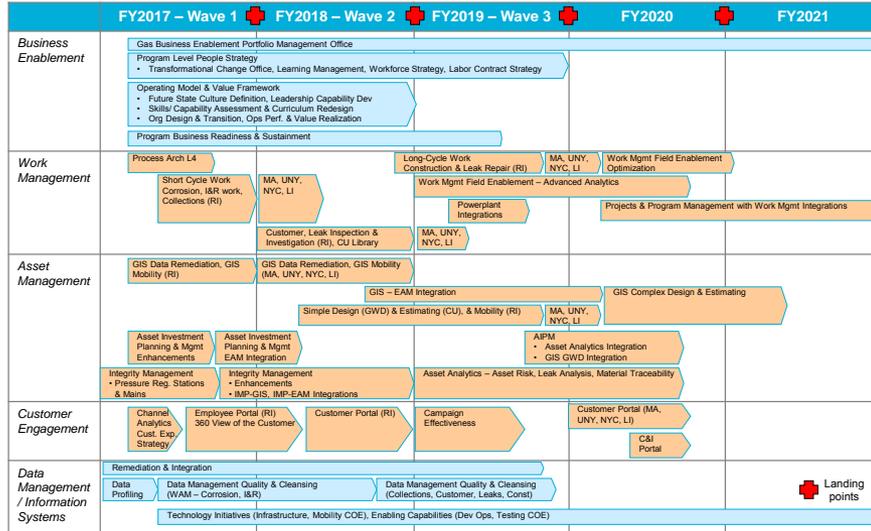
The delivery approach gives further program visibility, value assurance and optionality



CONFIDENTIAL



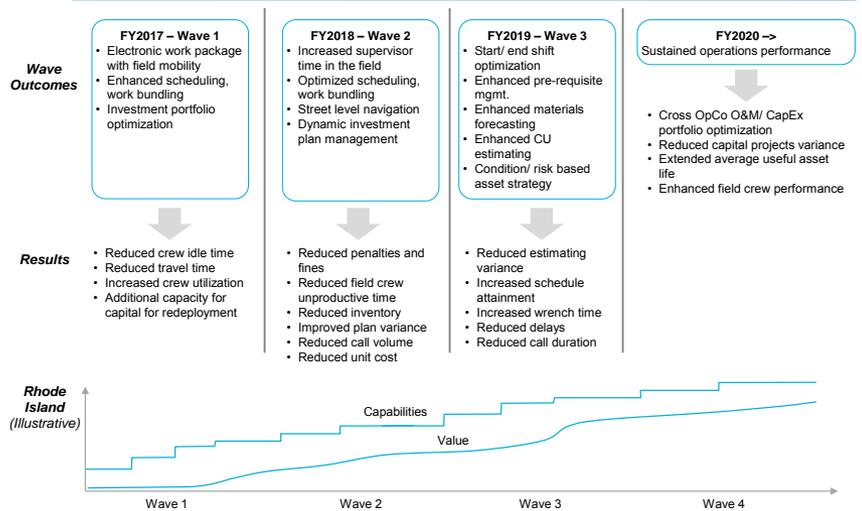
An initial view of the roadmap highlights the key waves over 5 years



CONFIDENTIAL



Each wave will deliver specific capabilities enabling performance improvements

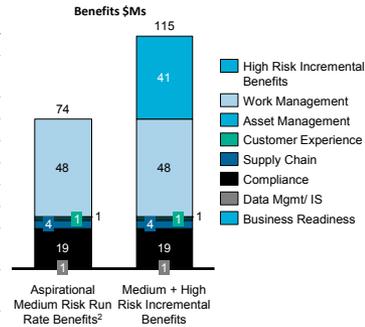


CONFIDENTIAL



Working draft breakdown of the initial estimate of \$520m costs and the associated aspirational benefits

Initiative	Cost \$Ms	% Total
Work Management, Scheduling, and Mobility	\$125	24%
GIS Consolidation / Upgrade, Remediation, Conflation, GWD, Estimating	\$92	18%
Data Management, Governance, Quality, and Cleansing ¹	\$59	11%
SAP and Application Integration / Remediation	\$38	7%
SW/HW including Mobility Platform	\$36	7%
Technical Field Training ¹	\$35	7%
Portfolio Management	\$33	6%
Business Readiness, & Sustainment	\$19	4%
Customer Interaction & Employee Support Interaction Portals ¹	\$19	4%
People Strategy, Learning Management, Workforce and Labor Strategy	\$16	3%
Operating Model, Org Design, Leadership Development & Value Framework	\$15	3%
IS Capabilities – Dev. Ops, Mobility CoE, Testing CoE, IS Operating Model	\$15	3%
Supply Chain ¹	\$11	2%
Other	\$8	2%
Total	\$520	



- Key cost estimation assumptions:
- Avg. total resources required (internal): 192 (59)
 - Total Resource % (ADR)
 - National Grid: 31% (\$908)
 - External Onshore: 42% (\$2,714)
 - External Offshore: 27% (\$540)

²Typically not included as part of the transformation business case

²Base Run Rate includes benefits related to field worker/clerk/engineer productivity, decreased call center volume, avoided damage claims, reduced compliance fines, and supply chain benefits (excluding one-time benefits)

CONFIDENTIAL



Questions for Discussion & Guidance

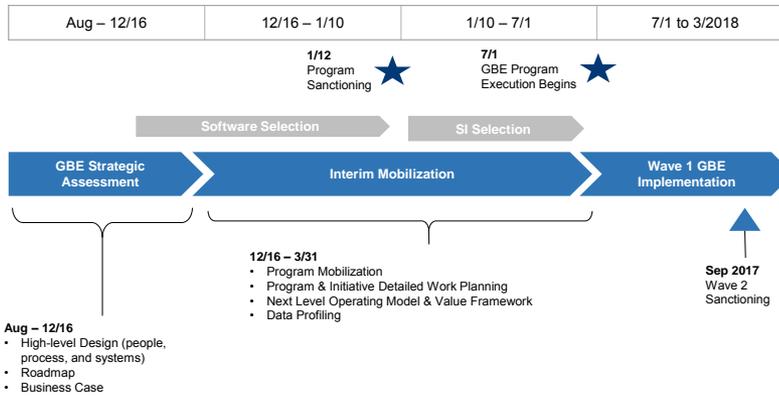
1. Is the value-oriented approach the appropriate deployment strategy?
2. Are there any items in the cost breakdown that should not be part of GBE?
3. Are there any obvious missing areas on the benefits that should be considered?
4. What would prevent you from recommending this program for sanctioning?

CONFIDENTIAL



If sanctioned in January, the program would commence in July 2017

Timeline and Key Milestones & Deliverables



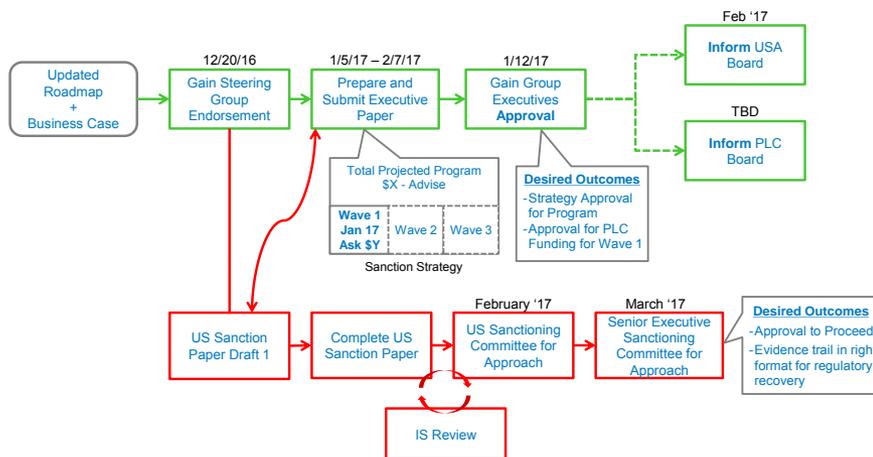


Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks / Meeting Objectives	(12:00) 10 min	JJ
Action Item Follow Up	5 min	KH
Program Status	5 min	KH
Technical Solution Updates: Software selection (NG Only)	10 min	CM
PowerPlan Recommendations (NG Only)	10 min	CM
Business Assurance Partner Update	10 min	CF
Business Case and Roadmap Development	50 min	JJ / SJ
<ul style="list-style-type: none"> • Scope, Context, Roadmap • Business Case 		
Executive Approval and Sanctioning Process	15 min	JJ
Meeting Close & Feedback	5 min (14:00)	JJ



Proposed Sanctioning Approach



nationalgrid

Meeting close

- AOB
- New Action Item Summary
- Leadership Pulse Check and Closing Remarks

nationalgrid

Appendices





Steering Group Action Item List (complete)

	Action	Owner	Assigned	Due	Comment	Complete?
1	Ensure that Enablement is added to the QPR agenda	PS	10 Mar 16	1 Apr 16		Yes
2	To provide visibility of the expect impact of Gas Business enablement on the ability to run the business due to a potential talent drain.	JJ	10 Mar 16	1 May 16	Phase 1 key roles have been filled with Business Leadership engagement and support. Subsequent staffing requirements will be reviewed regularly with the Design Authority	Aug 16
3	To identify the appropriate approach to ensure that the SG has visibility to the level of customization being undertaken by the project.	JJ	10 Mar 16	1 Oct 16	Phase 1: <ul style="list-style-type: none"> Formalize the design principle to minimize, customizations Provide a view of where customizations might be required in Phase 2 based on what we know. Phase 2: <ul style="list-style-type: none"> All customizations will be approved by Chris Murphy and Johnny Johnston and formally reported to the Steering Group. 	Oct 24
4	To share the rate case strategy and ensure that any appropriate costs are included in the MA Gas rate case.	JJ	10 Mar 16	1 Jul 16	Action Plan: 1) Engaging with NY rate case team 2) Coordinating with MA to include GE costs in the MA Gas case 3) Will work with Finance to deploy effective tools and processes to capture and report rate case data 4) Insure GE business case is rate case enabling	Aug 16



Action Items - continued

	Action	Owner	Assigned	Due	Comment	Complete?
5	Advise SG on Powerplan solution options impacting the Program	JJ	5 May 16	Nov 16	GE, in partnership with Finance, to sponsor study to identify plan, timings and costs to re-architect the integration of SAP / PowerPlan / Front Office	Oct 24
6	Review GBE Scope with Finance Remediation	KH	5 May 16	June 16	Rescheduled by Fin – working with RQ for new date	Sept 14
7	Add controls development to design phase success criteria	KH	5 May 16	June 16		Yes
8	Update the SG on proposal detail and procurement process status and selection criteria	JJ	5 May 16	June 16		Yes
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Pending completion of CWIP Analysis	Aug 16
10	Invite Internal Assurance to participate in vendor oral presentations and proposal review	KC	24 June 16	July 16	Complete – Input received	Yes
11	Provide a follow-up on staffing progress and plans	JJ	1 Aug 16	23 Aug 16	Complete	Aug 23



Risk Registry (complete)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
4	P1 Single solutions to each software category may not be possible	The desired end state is one software solution for each software category. If this is not possible, it will raise the level of complexity of our future state design and increase costs and lengthen timelines in both Phase 1 and Phase 2	M	H	HLD	Program	Houchins, Granville	Monitoring	11/18/16	11/18/16
5	P2 Failure to account for significant ongoing external initiatives	Not accounting for the impacts/integration points/scope overlaps between GE and other programs could create scope overlaps and/or conflicts. This could result in increased costs or delays in schedules	M	H	HLD	Program	Watkins, Wayne S.	Monitoring	12/22/16	
6	Data Quality Data Analysis	Gaps in our understanding of current state data quality and completeness, as well as over-reliance on anecdotal evidence could have negative impacts on our roadmap and business case. - Bad assumptions, unanticipated risks etc.	H	H	HLD	Program	Raad, Nicolas	Solution Proposed	12/2/16	12/2/16
7	Program staffing resiliency	Does the program have the sufficient team depth to overcome the effects of unplanned departures	M	M	HLD	Program	DeRamos, JWynn	Monitoring	12/22/16	
14	Failure to meet our staffing targets will impact our ability to initiate Phase 2 in a timely manner	If we don't complete our staffing process by our target date will mean that we have insufficient resources to effectively plan and charter Phase 2 projects. This could result in delays, increased costs.	M	H	PM	Staffing	DeRamos, JWynn	Monitoring	12/22/16	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
15	Mis-alignment / lack of integration and coordination between programs	Potentially a risk around enablement keeping joined up with other initiatives - eg Supervisor Enablement and strategic workforce planning	M	M	HLD	Workforce Planning	Irani-Famili, Reihaneh; DeRamos, JWynn	Monitoring	12/22/16	
16	Missing Expectations on progress due to SL start or late Phase 1 Completion	Delays in starting the program in a timely manner will impact long term timelines. Failure to complete Phase 1 deliverables in a timely manner could delay the sanctioning process and further delay kick off of deployment work.	M	VH	HLD	Delivery	Healy III, Kenneth	Solution Proposed	12/22/16	
17	Unsuccessful delivery due to scope creep	Unplanned/unapproved changes to scope can drive program costs, impact timely delivery or compromise the quality of program outcomes	M	VH	HLD	Delivery	Healy III, Kenneth	Solution Proposed	12/22/16	
18	Risk to Delivery Due to IS and Business capacity limitations	The program is dependent on multiple services and SMEs provided by the Functions, Business. Support delays and SME unavailability could impact timelines	H	H	HLD	Delivery	Connolly, Christopher; Murphy, Chris-US IT; Irani-Famili, Reihaneh; Healy III, Kenneth	Solution Proposed	12/22/16	
19	Delays in Labor Union Engagement Could Impact workshop participation	Failure to engage represented employees in the as is/ to be design process could mean that critical information, observations and expert inputs are missing from the HLD process	M	M	HLD	Quality	Connolly, Christopher	Closed	10/21/16	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
20	Short term required compliance mitigation activities could negatively impact long term deployment activities	A disproportionate emphasis on short compliance fixes could consume the time, resources and expertise required to launch and sustain longer term fixes	M	H	Comp.	Delivery	McNamara, Daniel F.	Closed	12/22/16	10/20/16
21	Impact Analysis Deliverable Timeline	Impact Analysis milestone date misalignment may impact the downstream delivery of other CM deliverables.	L	L	BDR	BR/CM	Poyant, Ellen L.	Closed	10/3/16	10/7/16
22	Unplanned outages during Implementation	Implementation and subsequent RTB (Run the Business) activities for U.S. Gas Enablement core platforms and products will be impacted by unplanned outages. Program Increments, or releases may be delayed due to resource availability or lack of testing.	H	M	SDD	Schedule	Krantz, Ronald D.	In Progress	2/1/17	
23	Powerplan Disintegration	Implementation Roadmap and removing Powerplan integration from work order creation and work execution processes may impact business/implementation roadmap and cost of program.	H	H	SDD	Budget and Schedule Risk	Geer, William J.	Monitoring	12/22/16	
24	Inappropriate use of Agile Delivery Methods	Applying Agile delivery methods against current application platforms and reporting & analytics environments may be inappropriate. Causing project delays.	H	M	SDD	Scope	Krantz, Ronald D.	In Progress	12/22/16	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
25	Constrained Benefits by lack of SCM Implementation	ERP Supply Chain and Materials Management capabilities are not fully deployed. Assumed benefits may be at risk of being attainable.	M	H	PM	Benefits	Connolly, Christopher, Healy III, Kenneth	In Progress	12/2/16	
27	Network Bandwidth	Pain point indicated that wifi availability was not present in barns. Mobile/Disconnected mobility may require increased network bandwidth.	M	M	SDD	IS Solution Architecture	Krantz, Ronald	Solution Proposed	12/22/16	5/1/17
28	ECM and HPUM remaining capabilities not mapped	The remaining capabilities (back office, customer, etc) that are not mapped between NG Enterprise Capability Model and the Accenture Utility Model need to be mapped to ensure process/capability connectivity and in support of future impact analysis.	M	L	HLD	Enterprise Business Architecture/ Solution	Lyba, Svetlana	Solution Proposed	1/12/17	3/31/17
29	Data Accessibility	Data is often not accessible, and when it is the spreadsheets are often too large to work with. Data summary documents provided by data managers are often more useful than the data itself.	H	H	PM	Program	Del Santo, Edward	New	11/30/16	
30	Auto dialing or texting wrong customer number	There is a TPCA compliance change that puts us at risk when we auto dial or text customers and their phone number is not correct. Need data cleansed and controlled to ensure we are not being fined.	H	M	Comp.	Quality	Raad, Nick; Piccarreto, Megan	New	5/1/2017	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
31	Benefits Identification	Benefits may not be as high / significant for a program / organization of this size and with respect to the starting point (e.g., 4th quartile in O&M/customer, Capital Unit Cost)	H	VH		PM	Del Santo, Edward; Connolly, Christopher	New	12/2/2016	
32	Benefits Buy In	Gas business leadership may not buy into / take ownership of identified benefits	H	VH		Delivery	Del Santo, Edward; Jones, Sandra; Johnston, Johnny	New	12/16/2016	

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Steering Group Pack



Johnny Johnston

20 December 2016, @ 1330 EST, Conf Room E1-995 (Joule) Res Woods



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks Meeting Objectives Action Item Follow Up	10 min	JJ
Recommended Roadmap and Business Plan • PwC Opinion • Field Training Assessment • Roadmap and Business Case • Decision	75 min	JJ
Program Next Steps (NG Only) • Current Position • Business Assurance Partner Feedback • Mobilization Activities and Recommended Accelerator and Enablement Projects • Decision/Approval	30 min	JJ / KH
Meeting Close & Feedback	5 min	JJ



Meeting Objectives

1. Seek approval to proceed to Group Executive Committee to sanction Year 1 of implementation having:
 1. Shared recommended roadmap, costs and benefits
 2. Confirmed scope to be included
 3. Confirmed sanctioning approach
2. Seek approval for interim activities for Q4 for FY17



Action Item Follow Up

	Action	Owner	Assigned	Due	Comment	Complete?
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	<ul style="list-style-type: none"> Gas Enablement will participate in Nov 30 / Dec 1 Work Order Remediation Workshops Lessons Learned Discussion scheduled for 12/1 	Completed
12	Provide a summary of actions taken / planned to address Business Assurance Partner observations	JJ	2 Dec	20 Dec	<ul style="list-style-type: none"> Plan to be reviewed during 12/20 Steering Group meeting 	Pending

For complete list see Appendix A



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks Meeting Objectives Action Item Follow Up	10 min	JJ
Recommended Roadmap and Business Plan • PwC Opinion • Field Training Assessment • Roadmap and Business Case • Decision	75 min	JJ
Program Next Steps (NG Only) • Current Position • Business Assurance Partner Feedback • Mobilization Activities and Recommended Accelerator and Enablement Projects • Decision/Approval	30 min	JJ / KH
Meeting Close & Feedback	5 min	JJ

PwC Advisory

Gas Business Enablement Program
Feedback to Steering Group
12-20-2016

This report and the information that it contains are solely for the benefit and restricted use of management and are not intended to be used or relied upon by any other party



Gas Business Enablement – Program Context

GBE is structured as a transformational program

-  It is designed to strengthen core business capabilities to drive your target outcomes
-  This requires addressing gaps and opportunities beyond process standardization and technology replacement - these include data, structure, people strategy, analytics, culture - and new technologies
-  Building leading capabilities in work and asset management and customer engagement is an effort-intensive journey and requires significant investment
-  You are seeking to make substantial changes in a large business - that cannot be accomplished without commensurate effort (there is no quick fix)

Program Scope

The current set of program initiatives includes:

- Core functional scope** - the basic set of WAMS and CE capabilities required by the business - moving the business to a new set of integrated modern applications and end-to-end processes
- Additional **proven functional capabilities** which are becoming industry standards
- Program Management
- Change Management- Business Readiness
- Data Management-Remediation
- Management Capabilities
- Technology Capabilities

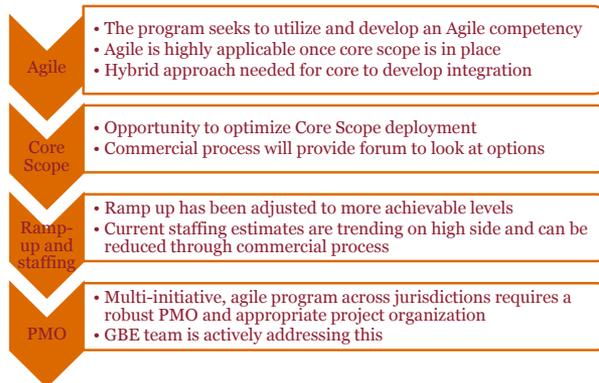
Program effort-cost estimate perspective

-  The effort estimate is significant - commensurate with achieving substantial business change
-  It is now structured and segmented to give visibility of the cost of the core scope and other scope components
-  The current program scope can be delivered within this estimate
-  There are several scope items which require deeper analysis – primarily data and GIS

Program risk control – level of spend



Deployment Approach



Strategic Assessment Deliverables Status

■ **Deliverables reviewed**

- Software Solution Selection
- Roadmap (In progress)

■ **8 Deliverables outstanding to be completed by the Strategic Assessment Consultant and reviewed by the Business Assurance team:**

1. Business Case
2. Implementation/deployment approach with recommended phasing
3. Resource Plan
4. Risk Inventory Analysis
5. Target Operating Model
6. Change Management Strategy
7. Executive Board Paper
8. SI Work Package

Summary Observation

While the above deliverables have been used to inform the business case, PwC has not had the opportunity to dive into the details of RICEFW Estimates, and Cost and Resourcing Details (in addition to the 8 deliverables outstanding) used to develop the final roadmap, and business case.



A study of Gas technical training has been completed

Challenges	
Increased regulatory focus on training vs. qualification	Increase in regulatory scrutiny and fines
Changing workforce demographics: knowledge drain	Hiring to backfill exiting workforce and support infrastructure replacement with 500 new hires
Significant infrastructure investment (\$1.6B)	Support transformation from Gas Enablement

- Corporate Audit Report No. 1994 found that National Grid’s technical training is not prepared to meet current or future business needs
 - 5 P2 findings and 1 P3 finding
- P-PIC compliance assessment also identified deficiencies with technical training
- HR/L&D and Gas business partnered with Mosaic to conduct training analysis
 - Mosaic is a national training and workforce consulting firm that focuses solely on the utility and oil & gas industries
- Findings validated/extended audit, and developed roadmap to help ensure workforce is ready to address challenges noted above
- Proposed 3 year cost is \$25M



Training study findings and recommendations

Key Findings

- Ineffective implementation of 70/20/10 training model (OJT, coaching/mentoring, and classroom training) leading to unmeasured and inconsistent training results with materials that are not up to industry standards
- Workforce trained to the task (OQ) and not the job, driving “check the box” behaviors that may jeopardize safety, efficiency, and compliance
- Ineffective governance process for defining training priorities leading to training that is not aligned to business objectives

Key Recommendations

Mosaic Pillar and Recommendation		Mosaic Pillar and Recommendation	
Employee Competence	Train to job/role vs. task	Instructor Excellence	Define and build program Measure performance Create feedback loop
Content and Tools	Rebuild and support 70/20/10	Facilities and Props	Further analysis required
Governance	Design and implement new model/process	Codes and Standards	Ensure alignment with L+D
Technology	Better use existing technology Add content development and management software		14

CONFIDENTIAL

nationalgrid

Gas Business Enablement

A holistic business transformation to fix today and enable tomorrow



December 2016

CONFIDENTIAL



The US Gas Business is facing a number of challenges today

We hold an unsustainable level of operational risk

- **Duplicate** and aging systems 117 applications vs ~20;
- 59% of our systems are **unsupported** by vendors
- Average **age** of system is 14 years vs 5 ~ 7 industry norm
- 69% of systems are at end of life, rising to 90% within 2 years, resulting in reduced **reliability** and increased **operational risk**

We need a step change in operational performance

- Operational performance and **compliance issues**
- Rising customer **expectations**
- Lack of **capacity** to respond to growth
- Diffuse **accountability** for operating performance
- Sustained under achievement of **ROE** avg of 8.5% vs 9.7% allowed over last 3 years

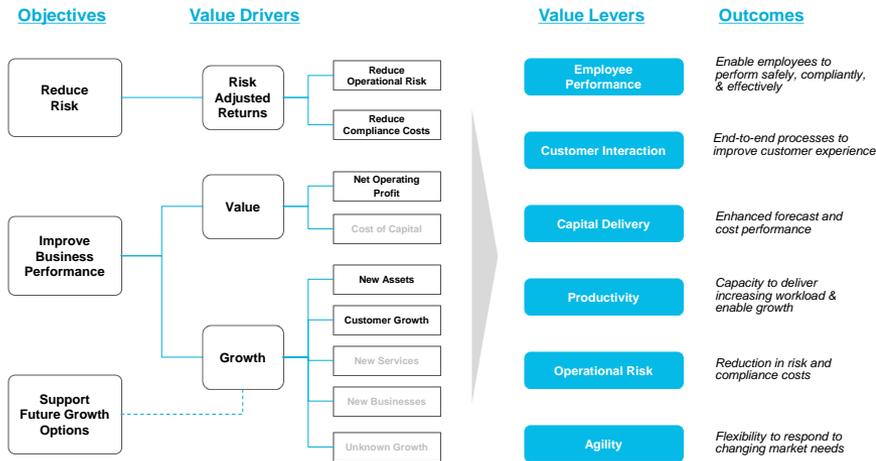
Our market framework is changing dramatically

- Rising regulatory **requirements** e.g. API 1173
- Changing public **sentiment** on gas e.g. environmental
- Competition and **opportunities** from alternative energy sources
- Transformative impact of **digital** on energy system

CONFIDENTIAL



The program is design to deliver three primary objectives which address the US gas business challenges



CONFIDENTIAL



In the strategic assessment phase, we developed the following initiatives to meet these objectives

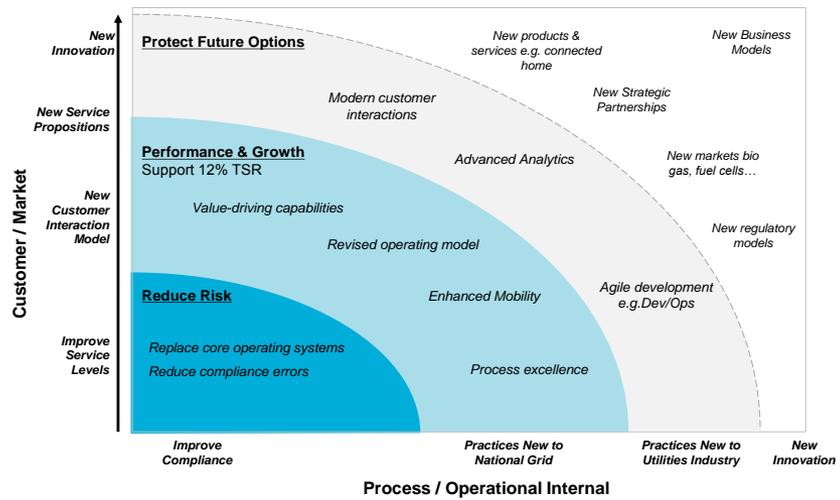
Workstreams	Initiatives					
GBE Portfolio Office						
Business Enablement	Program Level People Strategy	Operating Model & Value Framework	Program Business Readiness & Sustainment	Leadership Capability		
Work Management	Process Architecture	Work Management and Field Enablement	Work Management Analytics	Projects & Program Management		
Asset Management	Engineering, Design, Estimating & Mobility	Asset Investment Planning and Management	Integrity Management	Asset - Advanced Analytics		
Regulatory/ Compliance	Standards Operating Procedure Documentation	Document Management	Technical Training			
Customer Engagement	Customer Interaction	Customer Employee Journey	CRM / Contact Center	Channel Analytics		
Data Management	Data Management	Data Quality & Cleansing	Remediation & Integration			
Supply Chain	SC Process Architecture	Integrated Supply & Demand Planning	Capability Building	SC Master Data Improvements	Inventory Optimization	Warehouse & Network Optimization
Information Systems Enabling						

18

CONFIDENTIAL



To help prioritize we looked at our initiatives and implementation approach with different lenses



19

CONFIDENTIAL



The recommended program is a value-oriented approach that optimizes scope, value and risk

Option

Characteristics

1

Backbone only

- Minimum implementation required to mitigate key risks
- Focused on replacing core work and asset platforms over 3 years
- Simplifies, reduces implementation and risk
- Limited foundation for the future

**Risk Focused
Alternative**

2

Value Oriented

- Enhanced scope to meet program objectives
- Prioritized investment 'waves' over 5 years to deliver value
- Initial focus on risk reduction over first 3 years
- Annual decisions points to create optionality
- Addresses risk and desired business performance

**Recommended
Option**

3

**"Big Bang"
Approach**

- Comprehensive platform & capability scope in 3 years
- Minimized deployment time creates delivery risk
- Greater risk that desired performance improvements aren't achieved
- Ambition outweighs capability to deliver

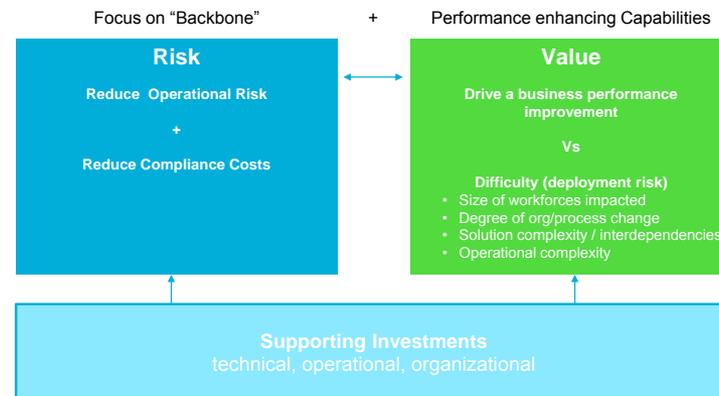
No further consideration was given to this option

CONFIDENTIAL

nationalgrid

For the Value Orientated approach (Option 2) there are three main categories of spend within the program

Prioritization Framework



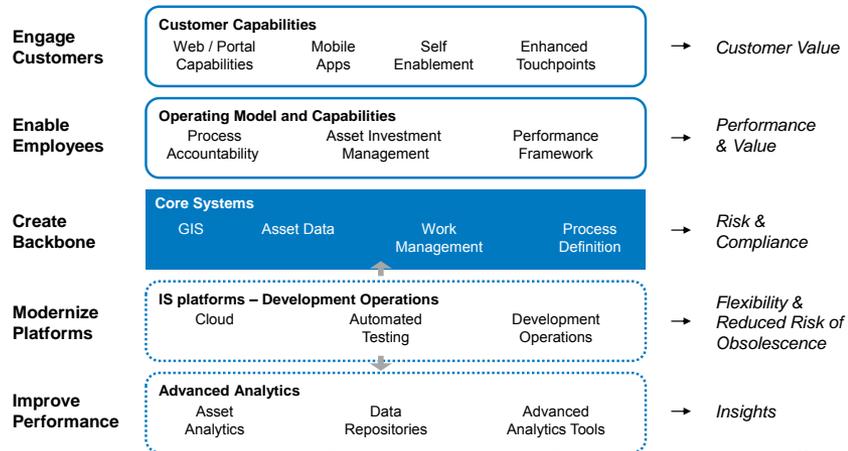
21

CONFIDENTIAL



Creating a solid backbone is core to delivering incremental value to the business going forwards

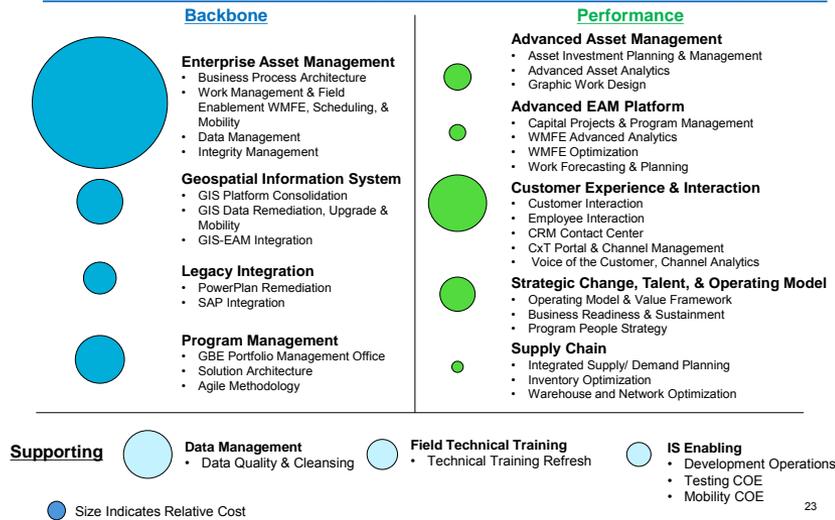
Conceptual Approach



CONFIDENTIAL



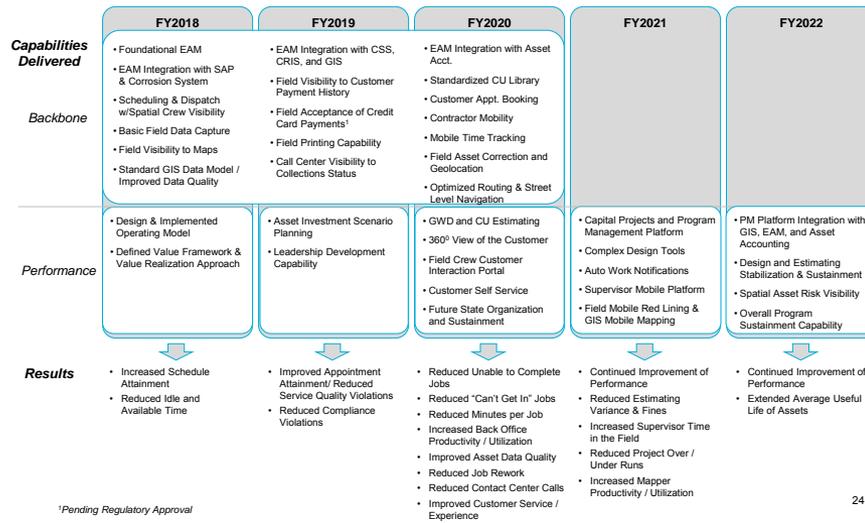
The recommended scope includes the required ‘backbone’ investment supplemented by prioritized value-adding capabilities



CONFIDENTIAL



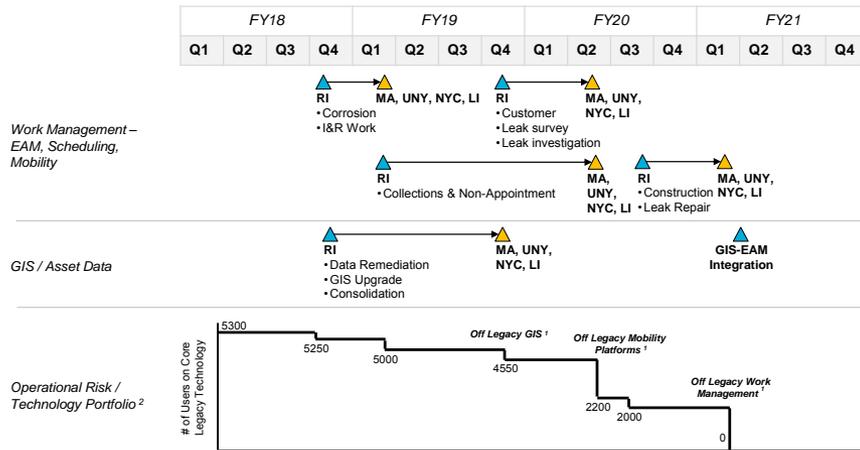
The deployment of capabilities drives performance and value



CONFIDENTIAL



The roadmap is designed to reduce risk over the first three years of the program as employees move off legacy platforms

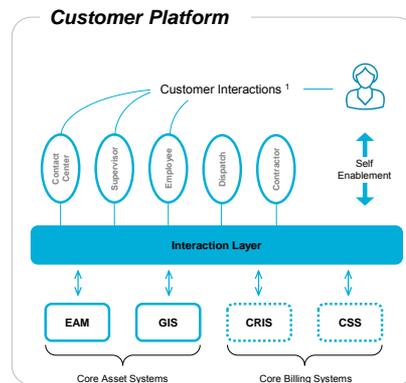


¹ Electric Business will remain on current shared legacy GIS and Work Management technology
² Legacy backbone applications estimated to go from 42 out of 117 total applications currently to 6 out of 22 post implementation

CONFIDENTIAL

nationalgrid

A significant differentiator for this program is the customer interaction layer that sits on top of our core systems



Note 1: Roughly 35% of customer call interactions relate to work that GBE will improve. Source: Call center data Jan 2016-Aug 2016

Our Ambition

- Provide customers with enhanced digital (online and mobile) capabilities, providing more **transparency** and **control** at key touchpoints, e.g.
 - Starting / stopping service
 - Making appointments
 - Providing information
- Giving employees (call center, field) visibility to better serve our customer
- Develop a flexible platform to better meet future customer, regulatory & business needs

Our Opportunity

- Deliver step change in customer performance
- Support customer growth
- Enable future service offerings

26

CONFIDENTIAL

nationalgrid

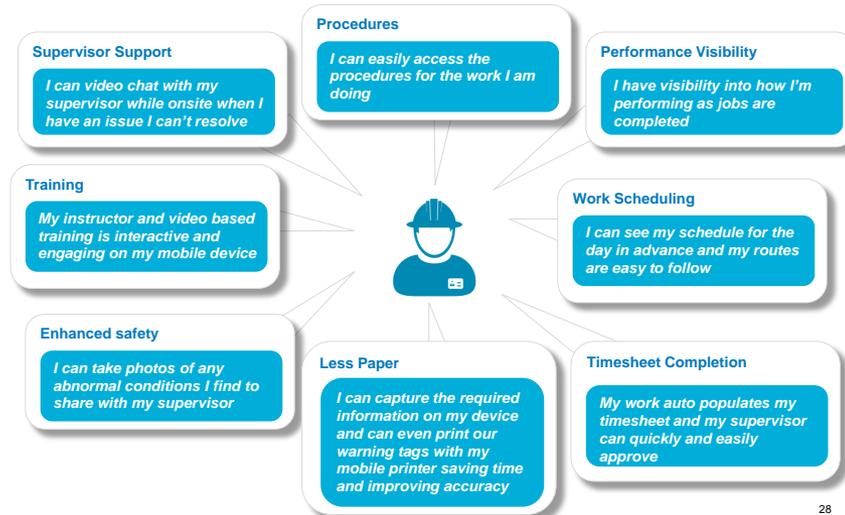
We plan to deliver a step change in customer experience...



CONFIDENTIAL

nationalgrid

... and enable our employees to perform



28

CONFIDENTIAL



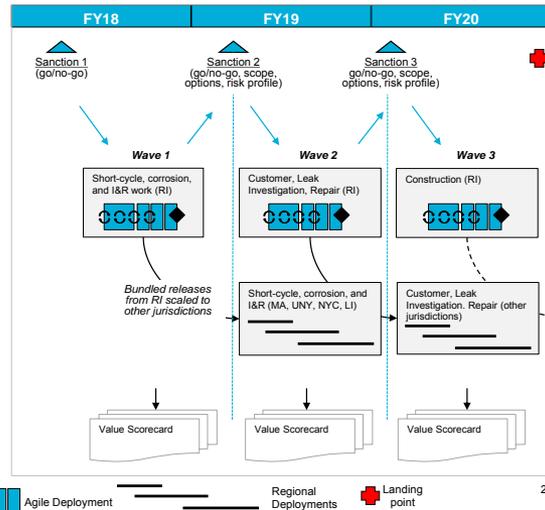
The delivery approach gives further program visibility, value assurance and optionality

Governance

- Sanction waves with scope decisions gives optionality
- Stage gates to manage deployment risk to jurisdictions
- Governed with focus on realizing value

Release Approach

- Rhode Island as test bed to validate performance and value
- Agile deployment approaches in Rhode Island waves to deliver 'Minimal Viable Product' then enhance based on value once working
- Capabilities bundled for scale rollout to other jurisdictions
- Performance framework defines measurable results of releases and waves

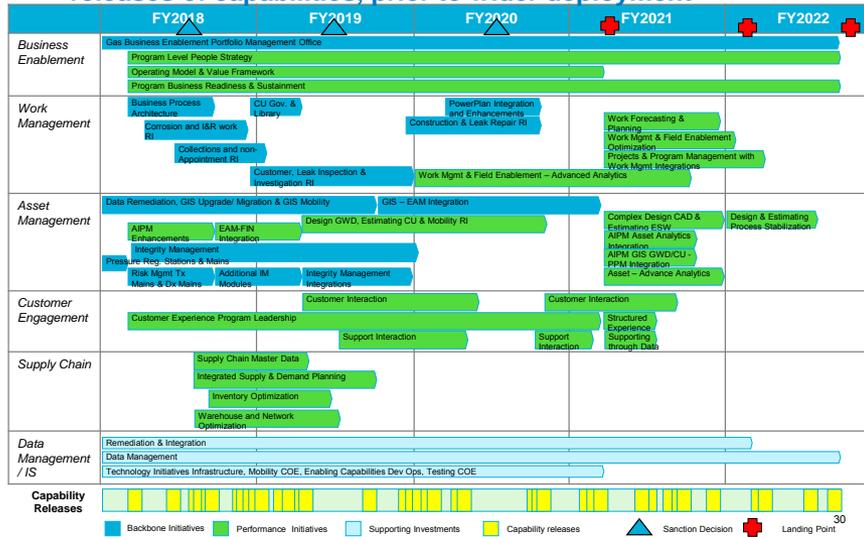


29

CONFIDENTIAL

nationalgrid

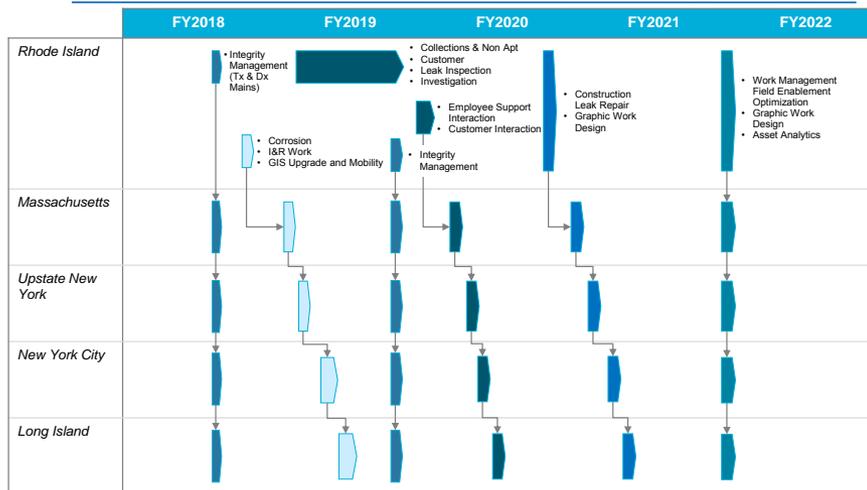
Rhode Island is the preferred pilot area for frequent agile releases of capabilities, prior to wider deployment



CONFIDENTIAL



Capabilities are then bundled into larger releases for jurisdictional deployment



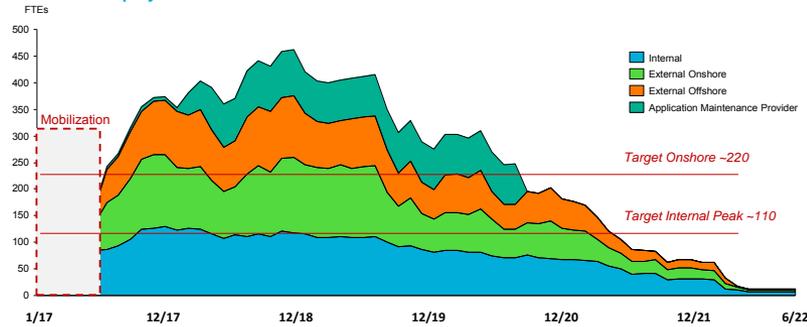
Release Deployment

CONFIDENTIAL



A mixture of internal & external (incl offshore) resources have been identified to successfully deliver the roadmap

Resource Map by Month¹



Internal Resource Requirements

	% of Total	Target on 9/2017	Current on 12/2016
Business	45%	50	24
IS	36%	40	9
PM	19%	20	7
Total	100%	110	40

¹Source: GBE Master Resource Plan V17 12/14/16

CONFIDENTIAL



\$134M of the \$466M total is being requested for the first year of the Program

	Initiatives	Cost \$Ms ^{1,2}	% Total
Backbone	Core EAM Platform	\$126	27%
	GIS	\$43	9%
	Legacy Integration	\$27	6%
	Program Management	\$43	9%
	Backbone Subtotal	\$239	51%
Performance	Advanced EAM Platform	\$15	3%
	Advanced Asset Management	\$25	5%
	Customer Experience & Interactions	\$55	12%
	Strategic Change, Talent, & Operating Model	\$33	7%
	Supply Chain	\$11	2%
	Performance Subtotal	\$139	30%
Supporting Investments	Field Technical Training	\$26	6%
	Data Management	\$41	9%
	IS Enabling	\$21	5%
	Supporting Investments Subtotal	\$88	19%
	Total w/Out Contingency	\$466M	
	Contingency³	\$19M	
	Total w/Contingency	\$485M	

¹ Costs include expenses (17% external, onshore labor cost; 10% internal labor costs); cost includes HW/SW

² Average Daily Rates: NG - \$845; External - \$1,001 (External Onshore - \$1,711; External Offshore - \$326)

³ Contingency (20%; applied to labor cost only) calculated on the second FY of the program which carries the highest cost profile of all fiscal years – reduced from a traditional program contingency of \$63M due to proposed annual sanctioning approach

CONFIDENTIAL

nationalgrid

The main benefits are reduced risk and increased safety and compliance however there are a number of other benefits

- The primary driver and benefit from Gas Business Enablement is **reduced operational risk** from aged system failure and **enhanced pipeline safety and compliance** from replacing aged and duplicative systems with modern platforms giving a single view of assets and work and having been aligned in design to API 1173 (process safety) control standards

Additional Benefits areas include:

- **Efficiencies:** \$33M¹ in annual benefits have been identified. Giving a 5 year 'payback' for the performance initiatives
- **Customer Experience:** Drive better appointment booking and attainment, enhanced call center visibility and enhanced digital experience
- **Employee Experience:** Driven by modern tools and platform that make it easier to do the job right and easily record the right information
- **Regulatory Reporting:** Having our assets and work in an enterprise system will significantly simplify our ability to report to our regulators

¹ See Appendix for a breakdown of the efficiency benefits

CONFIDENTIAL

nationalgrid

Regulatory Approach

- Being developed

CONFIDENTIAL



We will drive the program to achieve these critical success factors

Success Factors	Description
Leadership Commitment	Substantial involvement of leadership and line managers and strong accountability and commitment to program goals
Coordination & integration	Clear integration with other initiatives in progress that impact the gas business such as shaping our future, customer experience transformation, process improvement initiatives, and operating model changes
Technology Integration	Clear alignment of process designs with IS roadmap and strong collaboration on technology decisions and design / build activities
Value Delivery	Rigorous cascade of value drivers and specific performance goals with clear management of accountabilities to deliver results
Customer Value	Strong focus on understanding customer expectations and improving performance on dimensions that customers value
Organizational Momentum	Focused, energized project teams to drive pace and build excitement and enthusiasm for change over time
Stakeholder Management	Engagement of key external stakeholders as part of a carefully managed relationship migration strategy e.g., customers, regulators, political, union leadership
Transition / Operational Complexity	Identification and mitigation of potential transition risks that could impact day-to-day operations

36

CONFIDENTIAL



We will actively monitor and mitigate major program risks

Risk	Definition	Mitigations
Business disruption	The program causes performance of the business to be reduced because of disruptions to operations	<ul style="list-style-type: none"> Disciplined release planning anticipates complications Change Office reinforces disciplined go/no-go stage gate governance and change planning
Market context	Capabilities delivered lose relevance because of dramatic changes in market and or regulatory environment	<ul style="list-style-type: none"> Waves revisits context of each investment cycle Agile approaches improve relevance of solution approach
Change in strategic priorities	Business priorities change over time and reduce priority for further program investments	<ul style="list-style-type: none"> Strong alignment with current strategic priorities Sanction schedule provides for regular investments Input from US leadership and Group Executive
Sustainment of performance and value	Program fails to realize sustainable improvement in the performance of the business	<ul style="list-style-type: none"> Value framework identifies specific performance parameters for every initiative Operating Model strengthens accountability framework for the business
Capacity for change	Organizational inertia and culture prevents program from achieving required pace of change	<ul style="list-style-type: none"> Change office and ongoing organizational health metrics to diagnose organizational state GBE manages change portfolio for gas business
Scope creep	Scope and cost of program increases because of failure to stay focused on objectives	<ul style="list-style-type: none"> Value framework helps manage scope/value tradeoffs Agile approaches help identify most relevant solutions Sanctioning waves allow total costs to be controlled
Data quality	Cost and complexity of data conversion and cleansing is much greater than anticipated	<ul style="list-style-type: none"> Data discovery allows bottom up profiling of data and data quality
Resources / Capabilities	Business is unable to provide adequate resources and delivery capabilities to successfully manage the program	<ul style="list-style-type: none"> Resource plan has manageable ramp up Robust commercial process to find partners with desired capability at a competitive price

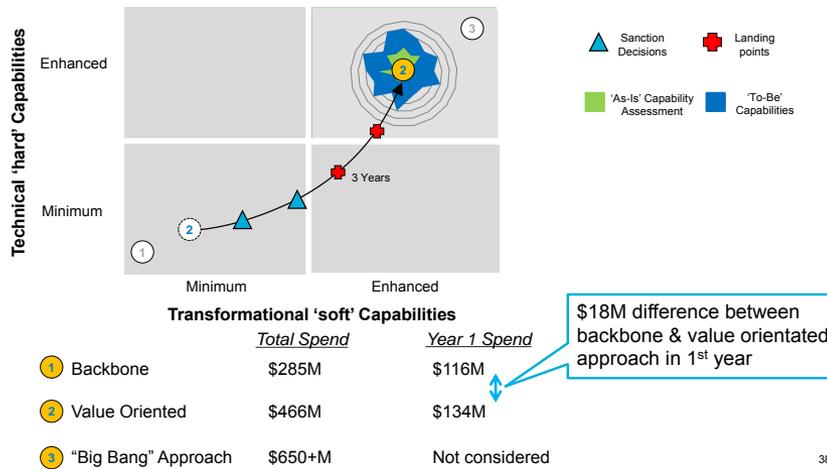
37

CONFIDENTIAL



The value oriented option costs an incremental \$18M in Year 1 that insures optionality for the full program

Value-Oriented Option



CONFIDENTIAL



The Gas Business Enablement Steering Group are asked to:

- 1. Gas Business Enablement Roadmap**
 - Confirm the Performance Initiatives and Supporting Investments are appropriate for the scope of the program
 - Endorse the recommended Value Driven (Option 2) roadmap and business case. Noting the 5 year \$466M investment, \$134M year 1 spend, \$19M rolling contingency and associated benefits.
- 2. Sanctioning Approach**
 - Recommend submitting the program to the National Grid Group Executive for sanctioning in January 2017. Requesting that the Committee:
 - support the proposed roadmap and sanctioning approach
 - approve \$134 investment for FY 18 (+\$18M contingency)
 - endorse the GBE Steering Group to oversee the program implementation
- 3. Governance**
 - Continue to provide Steering Group oversight and direction through the mobilization and implementation phases of the Program

39

CONFIDENTIAL



Appendix: Initiative Cost Detail

Initiative	Total Cost	% of Total
Backbone	(\$238,656)	51%
Performance	(\$138,601)	30%
Advanced Asset Management	(\$25,437)	5%
AIPM	(\$7,200)	2%
Asset - Advanced Analytics	(\$3,898)	1%
Engineering, Design, Estimating & Mobility	(\$14,339)	3%
Advanced EAM Platform	(\$15,114)	3%
Projects & Program Management	(\$4,756)	1%
Work Management & Field Enablement	(\$10,358)	2%
Customer Experience & Interactions	(\$54,526)	12%
Customer Experience Program Leadership	(\$2,823)	1%
Customer Interaction	(\$21,525)	5%
Structured Experiences	(\$1,387)	0%
Support Interaction	(\$28,674)	6%
Supporting through Data	(\$117)	0%
Strategic Change, Talent, & Operating Model	(\$32,595)	7%
Operating Model & Value Framework	(\$10,178)	2%
Program Business Readiness & Sustainment	(\$7,226)	2%
Program Level People Strategy	(\$15,191)	3%
Supply Chain	(\$10,929)	2%
Supporting Investments	(\$88,257)	19%
Data Management	(\$41,212)	9%
Field Technical Training	(\$26,000)	6%
IS Enabling	(\$21,045)	5%
Enabling Capabilities	(\$17,237)	4%
Technology Initiatives	(\$3,808)	1%
Grand Total	(\$465,514)	100%

40

CONFIDENTIAL



Appendix: Cost by Year by Cost Category

Cost Category ¹	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
Software O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Hardware O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Contractor O&M	\$0	(\$4,758)	(\$3,367)	\$0	\$0	\$0	(\$8,125)
External O&M	(\$26,628)	(\$30,008)	(\$18,340)	(\$13,450)	(\$4,654)	(\$350)	(\$93,430)
Internal O&M	(\$15,253)	(\$16,379)	(\$13,503)	(\$10,688)	(\$5,355)	(\$406)	(\$61,583)
Contingency O&M	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Expenses O&M	(\$3,957)	(\$4,404)	(\$2,738)	(\$1,967)	(\$677)	(\$57)	(\$13,799)
Total O&M Costs	(\$45,838)	(\$55,548)	(\$37,948)	(\$26,105)	(\$10,685)	(\$813)	(\$176,937)
Software	(\$30,263)	(\$7,158)	(\$50)	(\$4,050)	(\$50)	\$0	(\$41,571)
Hardware	(\$531)	(\$5,024)	(\$3,390)	\$0	\$0	\$0	(\$8,945)
Contractor CapEx	(\$16,700)	(\$33,140)	(\$18,768)	(\$2,167)	\$0	\$0	(\$70,775)
External CapEx	(\$29,492)	(\$38,135)	(\$30,897)	(\$17,223)	(\$4,161)	(\$189)	(\$120,098)
Internal CapEx	(\$7,458)	(\$9,295)	(\$7,889)	(\$5,174)	(\$936)	(\$15)	(\$30,768)
Contingency CapEx	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Expenses CapEx	(\$3,930)	(\$5,128)	(\$4,325)	(\$2,403)	(\$604)	(\$30)	(\$16,420)
Total CapEx Costs	(\$88,374)	(\$97,881)	(\$65,320)	(\$31,017)	(\$5,752)	(\$234)	(\$288,577)
Total Costs	(\$134,212)	(\$153,429)	(\$103,268)	(\$57,122)	(\$16,437)	(\$1,047)	(\$465,514)
						Contingency	\$18,763
						Total Costs	\$484,287

¹ Costs include expenses 17% external, onshore labor cost; 10% internal labor costs
² Contingency (20%; applied to labor cost only) calculated on the second FY of the program

CONFIDENTIAL



Appendix: OpCo Cost by Year

Operating Company	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
Brooklyn Union Gas KEDNY	\$ 40,398	\$ 46,182	\$ 31,084	\$ 17,194	\$ 4,948	\$ 315	\$ 140,120
Keyspan Gas East KEDLI	\$ 28,923	\$ 33,064	\$ 22,254	\$ 12,310	\$ 3,542	\$ 226	\$ 100,318
NiagraMohawk Gas	\$ 16,696	\$ 19,087	\$ 12,846	\$ 7,106	\$ 2,045	\$ 130	\$ 57,910
Boston Gas	\$ 31,258	\$ 35,734	\$ 24,051	\$ 13,304	\$ 3,828	\$ 244	\$ 108,418
Colonial Gas	\$ 6,992	\$ 7,994	\$ 5,380	\$ 2,976	\$ 856	\$ 55	\$ 24,253
Narragansett Gas	\$ 9,945	\$ 11,369	\$ 7,652	\$ 4,233	\$ 1,218	\$ 78	\$ 34,495
Total Costs	\$ 134,212	\$ 153,429	\$ 103,268	\$ 57,122	\$ 16,437	\$ 1,047	\$ 465,514

Costs include expenses 17% external, onshore labor cost; 10% internal labor costs; cost includes HW/SW; Contingency excluded

CONFIDENTIAL



Appendix: Annual Aspirational Benefits

Area	Aspirational Annual Benefit	Benefit Drivers
Work Management & Field Enablement	\$16M	<p>Increased Field Productivity / Utilization through:</p> <ul style="list-style-type: none"> Better scheduling & work bundling Optimized routing and street level navigation Automated dispatch Digital field data / information capture (e.g., photos, time sheets) Mobile red-lines and field asset updates <p>Increased Back Office Productivity / Utilization through:</p> <ul style="list-style-type: none"> Field automation (e.g., time sheets, asset information capture) Back office automation (e.g., auto matching of invoices to work orders)
Asset Management & Engineering	\$4M	<p>Increased Engineering Productivity / Utilization through:</p> <ul style="list-style-type: none"> Segmentation of non-Engineering work to other resources (e.g., project management) Improved integration of tools Standardized CU's and design templates <p>Increased Mapping Productivity / Utilization through:</p> <ul style="list-style-type: none"> Mobile red-lines and field asset updates <p>Other</p> <ul style="list-style-type: none"> Avoidance of penalties through improved estimating accuracy (NY Only)
Customer Experience	\$3M	<p>Increased Contact Center Productivity / Utilization through:</p> <ul style="list-style-type: none"> Reduction in calls due to self-service options and more accurate / timely information <p>Other</p> <ul style="list-style-type: none"> Avoidance of service quality penalties through better meeting customer commitments and improving customer satisfaction scores through a better customer experience
Compliance	\$9M	<p>Other</p> <ul style="list-style-type: none"> Avoidance of compliance / gas safety penalties
Other	\$1M	<p>Increased Analyst Productivity / Utilization through:</p> <ul style="list-style-type: none"> Reduction in the amount of time spent extracting and scrubbing data
Total	\$33M	

43

CONFIDENTIAL

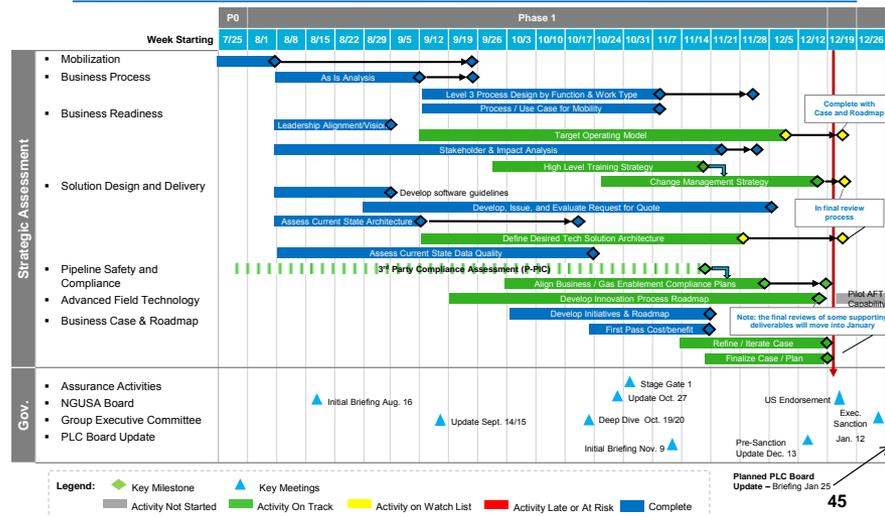


Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks Meeting Objectives Action Item Follow Up	10 min	JJ
Recommended Roadmap and Business Plan • PwC Opinion • Field Training Assessment • Roadmap and Business Case • Decision	75 min	JJ
Program Next Steps (NG Only) • Current Position • Business Assurance Partner Feedback • Mobilization Activities and Recommended Accelerator and Enablement Projects • Decision/Approval	30 min	JJ / KH
Meeting Close & Feedback	5 min	JJ



Key deliverables will complete on time, however some final reviews by PWC will complete in January





Gas Enablement Program Status

Scope Status And Impacts					Schedule Highlights																																	
1) Scope Status: Multiple potential scope changes are being evaluated: 1) Phase 2 "Accelerators" - Various 2) Approved changes since last update: 1) Software procurement support 2) PowerPlan Architecture – Design and Deploy phase 3) Next Scope "Inflection Point": Phase 2 Mobilization "Accelerator" – 12/20 4) Delivery Approach: Being addressed as part of Road Map and Business Case preparation 5) Customization KPI: To be developed in Phase 2 Mobilization					1) Key Milestones and Deliverables: 1) 13 of 22 Deliverables are complete, 9 remaining deliverables are in the build phase to complete 12/20. Draft and final reviews are underway but likely to extend to January. 2) Activities completed 1) Design Authority review of roadmap and business case 3) Upcoming activities: 1) Complete preparation of Executive Committee and Sanction Papers 2) Complete Phase 2 mobilization planning 4) Overall Schedule Status: Tracking to revised plan however some Deliverables are lagging in completion of final reviews																																	
Resources					Risk																																	
<table border="1"> <thead> <tr> <th>Staffing</th> <th>Plan</th> <th>Actual</th> <th>In-progress</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Wave 1/2/3</td> <td>71</td> <td>40</td> <td>23*</td> <td>●</td> </tr> </tbody> </table>					Staffing	Plan	Actual	In-progress	Trend	Wave 1/2/3	71	40	23*	●	<table border="1"> <thead> <tr> <th colspan="4">Top Three Risks (Phase 1)</th> </tr> <tr> <th>Risk</th> <th>Prob.</th> <th>Impact</th> <th>Mitigation Status</th> </tr> </thead> <tbody> <tr> <td>Data Management</td> <td>High</td> <td>Very High</td> <td>Mitigation plan in place (See Accelerators)</td> </tr> <tr> <td>Power Plan solution architecture</td> <td>High</td> <td>Very High</td> <td>Mitigation plan in place</td> </tr> <tr> <td>Incomplete cross US enterprise integration could degrade roadmap viability</td> <td>Med</td> <td>High</td> <td>Mitigation plan in place</td> </tr> </tbody> </table>				Top Three Risks (Phase 1)				Risk	Prob.	Impact	Mitigation Status	Data Management	High	Very High	Mitigation plan in place (See Accelerators)	Power Plan solution architecture	High	Very High	Mitigation plan in place	Incomplete cross US enterprise integration could degrade roadmap viability	Med	High	Mitigation plan in place
Staffing	Plan	Actual	In-progress	Trend																																		
Wave 1/2/3	71	40	23*	●																																		
Top Three Risks (Phase 1)																																						
Risk	Prob.	Impact	Mitigation Status																																			
Data Management	High	Very High	Mitigation plan in place (See Accelerators)																																			
Power Plan solution architecture	High	Very High	Mitigation plan in place																																			
Incomplete cross US enterprise integration could degrade roadmap viability	Med	High	Mitigation plan in place																																			
<table border="1"> <thead> <tr> <th>Finance / Budget Activity</th> <th>Status</th> <th>Trend</th> </tr> </thead> <tbody> <tr> <td>Program Budget Submitted</td> <td>●</td> <td>●</td> </tr> <tr> <td>Forecasted spend (against targets)</td> <td>●</td> <td>●</td> </tr> <tr> <td>Financial Reporting</td> <td>●</td> <td>●</td> </tr> </tbody> </table>					Finance / Budget Activity	Status	Trend	Program Budget Submitted	●	●	Forecasted spend (against targets)	●	●	Financial Reporting	●	●	1) Will initialize collaboration between Enterprise and Program risk management in January 2) Program risk review for mobilization and Phase 2 planned for January 16 3) Risks identified Business Case Risk Inventory Analysis to be incorporated into Program risk register upon																					
Finance / Budget Activity	Status	Trend																																				
Program Budget Submitted	●	●																																				
Forecasted spend (against targets)	●	●																																				
Financial Reporting	●	●																																				
1) In-Progress – includes all positions now open with the Process team. (There are 15 openings) 2) In-progress numbers include 3 accepted offers with start dates in January 3) Forecast Spend – currently trending to come in at or slightly below budget 4) Financial Reporting – producing monthly reporting on actual, budget, and forecast					1) In-Progress – includes all positions now open with the Process team. (There are 15 openings) 2) In-progress numbers include 3 accepted offers with start dates in January 3) Forecast Spend – currently trending to come in at or slightly below budget 4) Financial Reporting – producing monthly reporting on actual, budget, and forecast																																	

At the Dec 2 Steering Group meeting PWC provided significant feedback on the Phase 1 work packages

Their overall conclusion was: "The outstanding gaps and shortcomings identified in the design deliverables do not prevent development of the roadmap and business case".

Observations

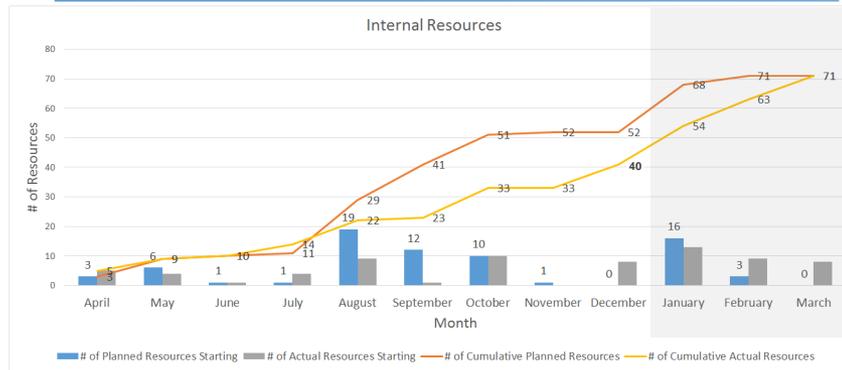
- The **Pain Point and Opportunity Analysis** was not complete or provide cross references
- The **High Level Business Requirements** had extensive gaps including some work types and industry best practices. The majority of RICEFW categorizations were incorrectly assigned, which will impact cost calculation
- The **Level 3 Business Process Flows** have gaps (see appendix for details)
- The **Key Business Decision (KBD) Inventory** has gaps or some KBD's require additional analysis or supporting documentation
- Various **Road Map Observations**, including:
 - Large number of initiatives in 4 year period
 - Loss of focus on core capabilities in early years
 - Cost impact of non-core scope
 - No clear linkage between design elements into the roadmap
 - Focus on foundational GBE scope

For further details see Appendix C and D

Our Response

- The GE Program team has been through the feedback line by line and is either comfortable the issues have since been addressed or have developed additional actions to better address.
- The Phase 2 mobilization plan also includes several initiatives that will positively impact the observations and recommendations provided by PWC
- These observations and our responses are addressed in detail in the Appendix D

The Program is already preparing for Phase 2, with recruiting underway nationalgrid



Strategy to fill gaps of roles for Jan-March openings:

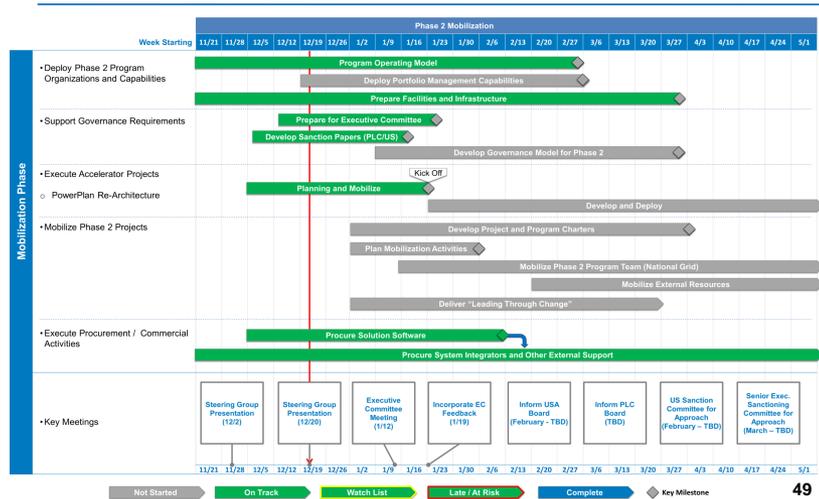
- Currently in active discussion to hire 5 employees for developmental moves (likelihood low to medium as competing with other offers)
- Continue discussion to obtain PEX practitioners to fulfill process roles
- Work with Talent Acquisition to expand posting/advert plan for all current postings
- Continue to socialize all open roles with various VPs/HRBPs in the business
- Phase 2 Prep: Begin recruiting activities in February and March to support continuing ramp up in April through June

Risks:

- Difficulty in attracting internal candidates into the business given competing opportunities
- Competing priorities from leads to support recruiting efforts to identify external candidates
- Low application rate from both internal/external candidates due to current time of year

nationalgrid

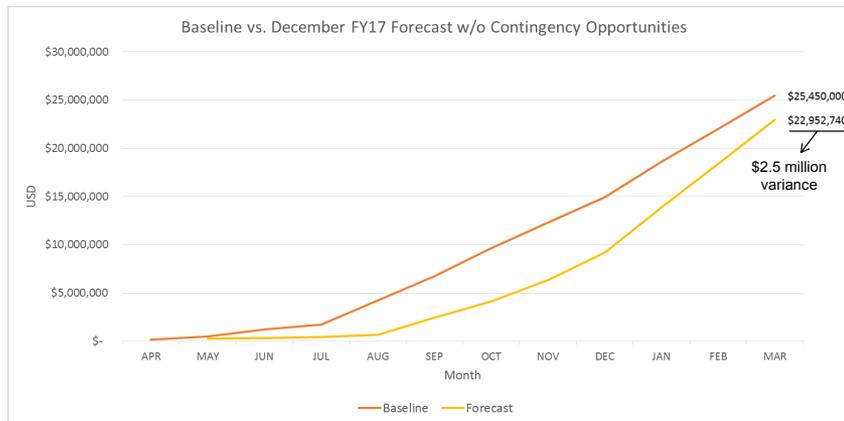
During the next quarter, the Program will begin a broad range of Phase 2 mobilization activities



For details on activities see Appendix D



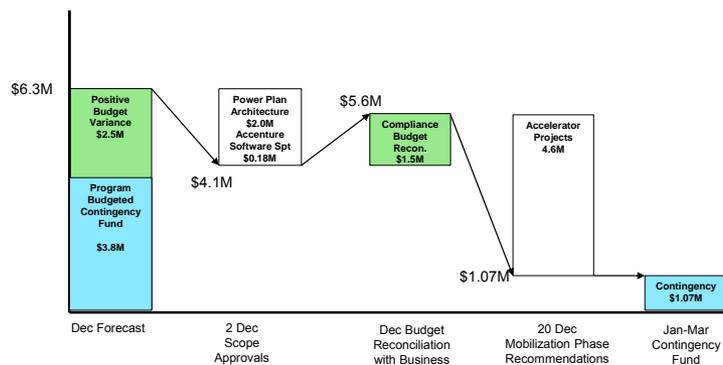
Based on current plans and actuals to date, we are tracking to a positive variance of \$2.5M, plus a \$3.8M contingency



- Baseline & December 16 Forecast includes \$3.8 Contingency and \$5m in planned Compliance spend.
- December 16 Forecast is \$2.5m favorable to Baseline which is primarily the result of a slower than planned ramp up of the National Team
- December 16 Forecast excludes Accelerator opportunities.



This strong budget position provides opportunities to mitigate Business and Phase 2 mobilization risks





These “accelerator” projects will prepare us for Phase 2 ramp up and address Assurance Partner feedback...

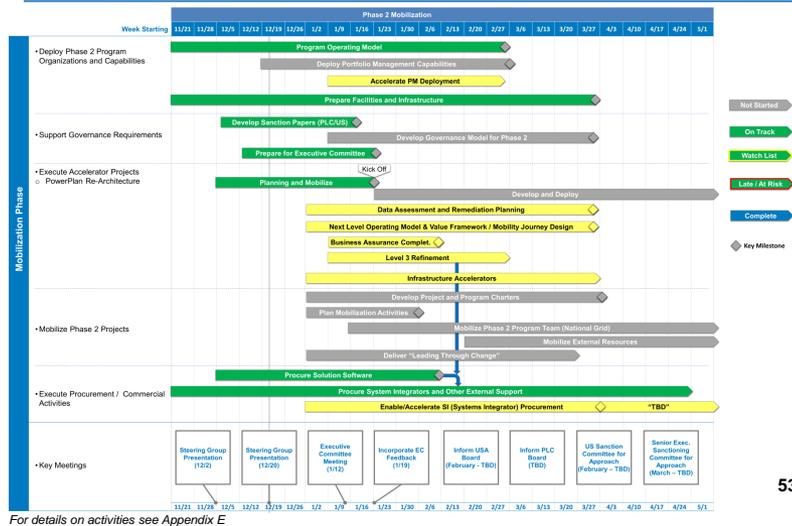
Name	Description	Timeframe	Cost	Support
Accelerate PM Deployment	<ul style="list-style-type: none"> Accelerate deployment of robust Phase 2 governance and management capabilities Value: Reduce overall time/cost to deploy CSF driven capabilities 	Jan 9 – Mar 3	\$244K	PWC
Data Assessment and Remediation Planning	<ul style="list-style-type: none"> Determine current state of data, establish quality baseline, plan data clean up Value: Mitigate critical program risk, accelerate Phase 2 mobilization 	Jan 2- Mar 31	\$1000K	PWC
Next Level Operating Model / Mobility Journey Design	<ul style="list-style-type: none"> Support project chartering, begin operating model, mobility and program change office foundational activities Value: Reduce program delivery risk 	Jan 2- Mar 31	\$1,500	Accenture
Business Assurance Completion	<ul style="list-style-type: none"> Support completion of final deliverable reviews Value: Enhances the quality detailed planning activities 	Jan 9 – Feb 3	\$100K	PwC
Level 3 Process Refinement	<ul style="list-style-type: none"> Expand on high level design deliverables Value: Improve effectiveness of procurement processes and detailed planning for Phase 2 	Jan 9 - Feb 24	\$430K	PwC
Infrastructure Accelerators	<ul style="list-style-type: none"> Begin planning and capability building for Phase 2 infrastructure related activities Value: Reduce program delivery risk 	Jan 2 – Mar 31	\$600K	TBD
Enable/Accelerate SI Procurement	<ul style="list-style-type: none"> Provide additional legal and procurement support for timely and effective procurement of software and services Value: Reduce risk of delaying start of Phase 2 	Jan. 2 – Mar 31	\$500K	TBD
Facilities / infrastructure expansion	<ul style="list-style-type: none"> Enable ramp up of resources and facilities to support Phase 2 mobilization Value: Reduce risk of delaying start of Phase 2 	Jan 2 – Mar 31	\$200K	Various

Note: Total does not include already approved activities (e.g., PowerPlan and ACC Software Procurement)

Total: \$4,574M

52

... and can be supported without risk within the Program
Phase 2 mobilization plan (FY17 4Q)



For details on activities see Appendix E

nationalgrid

May we have your

- Endorsement of the recommended mobilization plan
- Approval of the release of contingency funds to support Mobilization Phase accelerator projects

nationalgrid

Meeting close

- AOB
- New Action Item Summary
- Leadership Pulse Check and Closing Remarks

nationalgrid

Appendix

- A – Steering Group Action Item List
- B – 12 / 2 Assurance Partner Feedback
- C – NG Response to PwC Feedback
- D – Risk Registry

Appendix - A



Steering Group Action Item List (complete)

Action	Owner	Assigned	Due	Comment	Complete?
1	PS	10 Mar 16	1 Apr 16		Yes
2	JJ	10 Mar 16	1 May 16	Phase 1 key roles have been filled with Business Leadership engagement and support. Subsequent staffing requirements will be reviewed regularly with the Design Authority	Aug 16
3	JJ	10 Mar 16	1 Oct 16	Phase 1: <ul style="list-style-type: none"> Formalize the design principle to minimize, customizations Provide a view of where customizations might be required in Phase 2 based on what we know. Phase 2: <ul style="list-style-type: none"> All customizations will be approved by Chris Murphy and Johnny Johnston and formally reported to the Steering Group. 	Oct 24
4	JJ	10 Mar 16	1 Jul 16	Action Plan: 1) Engaging with NY rate case team 2) Coordinating with MA to include GE costs in the MA Gas case 3) Will work with Finance to deploy effective tools and processes to capture and report rate case data 4) Insure GE business case is rate case enabling	Aug 16



Action Items - continued

	Action	Owner	Assigned	Due	Comment	Complete?
5	Advise SG on PowerPlan solution options impacting the Program	JJ	5 May 16	Nov 16	GE, in partnership with Finance, to sponsor study to identify plan, timings and costs to re-architect the integration of SAP / PowerPlan / Front Office	Oct 24
6	Review GBE Scope with Finance Remediation	KH	5 May 16	June 16	Rescheduled by Fin – working with RQ for new date	Sept 14
7	Add controls development to design phase success criteria	KH	5 May 16	June 16		Yes
8	Update the SG on proposal detail and procurement process status and selection criteria	JJ	5 May 16	June 16		Yes
9	Align CWIP and GE programs and incorporate into GE program risk matrix as appropriate	KC	24 June 16	Aug 16	Pending completion of CWIP Analysis	Aug 16
10	Invite Internal Assurance to participate in vendor oral presentations and proposal review	KC	24 June 16	July 16	Complete – Input received	Yes
11	Provide a follow-up on staffing progress and plans	JJ	1 Aug 16	23 Aug 16	Complete	Aug 23
12	Provide a summary of actions taken / planned to address Business Assurance Partner observations	JJ	2 Dec	20 Dec	Plan to be reviewed during 12/20 Steering Group meeting	Pending

Appendix - B



Key Observations

■ Deliverables reviewed

- High Level Business Requirements
- Key Business and Technical Decisions Inventory
- Processes and Key Use Cases for Connected and Disconnected Mobility
- Future-state information, application, and integration architecture (draft)
- Change Impact Analysis
- Application and technology roadmap including enabling capabilities (draft)

Observations	Recommendations
Detailed Observations on Design and Roadmap on following slides	



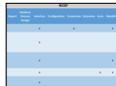
Design

Key Findings

Through the BA reviews, gaps in the quality and completeness of the Design deliverables were identified and not fully addressed:

The **Pain Point and Opportunity Analysis** did not:

1. Bridge the gap from current to desired state
2. Identify industry best practices and tools
3. Cross reference pain points to provide a pivot to the future state



The **High Level Business Requirements** had extensive gaps including:

1. An incomplete inventory missing many important capabilities to support various work types
2. Missing industry best practice requirements
3. The majority of RICEFW categorizations were incorrectly assigned, which will impact cost calculation

The **Level 3 Business Process Flows** have gaps including:

1. No clear inventory or decomposition of level 1, level 2 and level 3 flows
2. No variations illustrated across different work types
3. No link between process steps and related business requirements that support them
4. No swim lanes / roles or visual representation of system interaction
5. Asset Management capabilities do not have detail flows
6. Capital Projects and Portfolio Management capabilities and process flows are not defined



The **Key Business Decision Inventory** has gaps including:

1. Several KBDs require more supporting documentation than is available in the inventory itself
2. Several KBDs were identified where it appeared that further analysis (is) required before determining the approach/consensus
3. Over 20 additional KBDs identified for addition

Implications

The outstanding gaps and shortcomings identified in the design deliverables **do not** prevent development of the roadmap and business case (apart from fuzziness on initiative scope)

The main impact will be on National Grid's ability to issue clearly defined RFP's for software selection and system integration services – a solid set of future state design specifications are required for precise scoping

Recommended Actions

Use Q1 2017 to perform a more detailed and thorough development of Level 3 process flows and develop appropriate linkages to requirements and pain points – **focusing on Core Scope first**

60

Roadmap

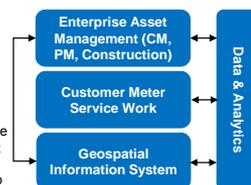
Key Findings

While not fully completed, the initial draft Roadmap has been reviewed and the following conclusions have been drawn to date:

1. The roadmap is comprehensive and provides a large number of initiatives and activities to perform over a four year period.
2. An excess of work and scope is included in the first 3-4 years of the program. This distracts from the main priority of **implementing core scope across the jurisdictions (3+5 model)**. Loses focus on driving the value from getting the core capabilities "right" – and then adding more advanced capabilities from there.
3. Cost/effort estimate of Years 1-4 is bloated by high ratio of non-core scope
4. No clear linkage from the design elements into the roadmap i.e. mapping of capability/process inventory to initiatives. Unable to see which pain points/opportunities, requirements, and processes are enabled within each initiative on the roadmap.
5. The focus should be on foundational GBE scope to enable enterprise end-to-end work and asset management process through a highly integrated architecture (move the business onto a modern, integrated platform).



GBE Foundational/Core Scope



Implications

Creating a roadmap that is overly complex with too many moving parts will be difficult to manage and add risk.

Additionally, as this is a major program, it will be important that the focus of the organization is not pulled into too many directions during the early part of the program.

Recommended Actions

Use the remaining time in Q4 2016 to develop a robust plan to implement the core scope across all jurisdictions in ~3 years.

Appendix - C



National Grid response to PwC feedback

PWC Feedback	NG Response
<p>The Pain Point and Opportunity Analysis did not:</p> <ol style="list-style-type: none"> 1. Bridge the gap from current to desired state 2. Identify industry best practices and tools 3. Cross reference pain points to provide a pivot to the future state 	<ol style="list-style-type: none"> 1. NG worked with Accenture to ensure Pain Points link to Themes/Opportunity Areas which link to Requirements which link to Initiatives which link to Resource Plans which link to Costs. Requirements link directly to Benefits. However working with PWC, NG believe there is further value here and have identified an interim workpack item to address. NG Business Team is currently validating the traceability from pain points to requirements 2. We have completed a number of best practice visits as well as receiving input from Accenture & PWC. We are comfortable we have received good industry insight. We will continue to complete best practice visits to continue to learn from others. 3. See point 1
<p>The High Level Business Requirements had extensive gaps including:</p> <ol style="list-style-type: none"> 1. An incomplete inventory missing many important capabilities to support various work types 2. Missing industry best practice requirements 3. The majority of RICEFW categorizations were incorrectly assigned, which will impact cost calculation 	<ol style="list-style-type: none"> 1. Using PWC feedback, additional requirements were added by Accenture. Many of the 'missing requirements' were standard requirements not differentiating requirements that would drive scope or cost into the program. PWC have provided the additional level of detail as part of their support for the program. 2. NG comfortable that with additional support from PWC we now have captured the requirements needed to inform the initiatives that support the business case. 3. RAWICE is the inventory Accenture uses for Maximo and RICEFW is used for SAP – following the initial PWC observations, the RICEFW objects were corrected and these have been reviewed by internal solution architects and signed off



National Grid response to PwC feedback

PwC Feedback	NG Response
<p>The Level 3 Business Process Flows have gaps including:</p> <ol style="list-style-type: none"> 1. No clear inventory or decomposition of level 1, level 2 and level 3 flows 2. No variations illustrated across different work types 3. No link between process steps and related business requirements that support them 4. No swim lanes / roles or visual representation of system interaction 5. Asset Management capabilities do not have detail flows 6. Capital Projects and Portfolio Management capabilities and process flows are not defined 	<ol style="list-style-type: none"> 1. PwC follows a different methodology for Strategic Assessments which is not aligned with Accenture's approach. <ul style="list-style-type: none"> • Accenture's High Performance Utility Model for gas distribution provides the full hierarchy of Level 1 – 5 processes and was the basis for the engagement work effort. 2. We developed fully integrated L3 process flows with distinct differences by work type for a number of priority work types as incremental work agreed with Accenture 3. Requirements are linked to the Processes through Capabilities in the Requirements Tracking Matrix. 4. In the Accenture process, the processes have swim lanes that will need to be added during Level 4 Process Architecture to reflect operating model design. 5. PwC may not have seen, but Asset Management process flows were provided and approved by National Grid leadership. 6. In the Accenture approach, process flows and detailed analysis of Capital Projects including a stage gate process that is traditionally a detailed design deliverable. <p>NG believes that additional L3 process detail will help with better defining Phase 2 work packages. An accelerator project has been proposed for the Phase 2 mobilization phase</p>



National Grid response to PwC feedback

The **Key Business Decision Inventory** has gaps including:

1. Several KBDs require more supporting documentation than is available in the inventory itself
2. Several KBDs were identified where it appeared that further analysis (is) required before determining the approach/consensus
3. Over 20 additional KBDs identified for addition

- Accenture provided our KBD Inventory of 35 key business decisions with initial recommendations. For this effort we documented and vetted over 180 KBD's which refined the list to 116. Of those, 30 were presented to the Design Authority and the balance were deemed too detailed and deferred to the next phase for consideration at the project team level.



National Grid response to PwC feedback

PwC Feedback	NG Response
<ol style="list-style-type: none"> The roadmap is comprehensive and provides a large number of initiatives and activities to perform over a four year period. An excess of work and scope is included in the first 3-4 years of the program. This distracts from the main priority of implementing core scope across the jurisdictions (3+5 model). Loses focus on driving the value from getting the core capabilities "right" – and then adding more advanced capabilities from there. Cost/effort estimate of Years 1-4 is bloated by high ratio of non-core scope No clear linkage from the design elements into the roadmap i.e. mapping of capability/process inventory to initiatives. Unable to see which pain points/opportunities, requirements, and processes are enabled within each initiative on the roadmap. The focus should be on foundational GBE scope to enable enterprise end-to-end work and asset management process through a highly integrated architecture (move the business onto a modern, integrated platform). 	<ol style="list-style-type: none"> Agreed We have focused on a value focused roadmap that has a mix of core and value adding initiatives to drive a business transformation (with a strong initial focus on risk) rather than a pure technology replacement program – we believe this is the right balance. We have reviewed the scope and costs with Accenture and PwC and significantly reduced costs since this observation and believe these are appropriate estimates for this point in the program lifecycle. See Page 1 this has been addressed Agreed – see steering group deck

Appendix - D



Risk Registry (complete)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
4	P1 Single solutions to each software category may not be possible	The desired end state is one software solution for each software category. If this is not possible, it will raise the level of complexity of our future state design and increase costs and lengthen timelines in both Phase 1 and Phase 2	M	H	HLD	Program	Houchins, Granville	Monitoring	11/18/16	11/18/16
5	P2 Failure to account for significant ongoing external initiatives	Not accounting for the impacts/integration points/scope overlaps between GE and other programs could create scope overlaps and/or conflicts. This could result in increased costs or delays in schedules	M	H	HLD	Program	Watkins, Wayne S.	Monitoring	12/22/16	
6	Data Quality Data Analysis	Gaps in our understanding of current state data quality and completeness, as well as over-reliance on anecdotal evidence could have negative impacts on our roadmap and business case. - Bad assumptions, unanticipated risks etc	H	H	HLD	Program	Raad, Nicolas	Solution Proposed	12/2/16	12/2/16
7	Program staffing resiliency	Does the program have the sufficient team depth to overcome the effects of unplanned departures	M	M	HLD	Program	DeRamos, JWynn	Monitoring	12/22/16	
14	Failure to meet our staffing targets will impact our ability to initiate Phase 2 in a timely manner	If we don't complete our staffing process by our target date will mean that we have insufficient resources to effectively plan and charter Phase 2 projects. This could result in delays, increased costs.	M	H	PM	Staffing	DeRamos, JWynn	Monitoring	12/22/16	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
15	Mis-alignment / lack of integration and coordination between programs	Potentially a risk around enablement keeping joined up with other initiatives - eg Supervisor Enablement and strategic workforce planning	M	M	HLD	Workforce Planning	Irani-Famili, Reihaneh; DeRamos, JWynn	Monitoring	12/22/16	
16	Missing Expectations on progress due to SL start or late Phase 1 Completion	Delays in starting the program in a timely manner will impact long term timelines. Failure to complete Phase 1 deliverables in a timely manner could delay the sanctioning process and further delay kick off of deployment work.	M	VH	HLD	Delivery	Healy III, Kenneth	Solution Proposed	12/22/16	
17	Unsuccessful delivery due to scope creep	Unplanned/unapproved changes to scope can drive program costs, impact timely delivery or compromise the quality of program outcomes	M	VH	HLD	Delivery	Healy III, Kenneth	Solution Proposed	12/22/16	
18	Risk to Delivery Due to IS and Business capacity limitations	The program is dependent on multiple services and SMEs provided by the Functions, Business. Support delays and SME unavailability could impact timelines	H	H	HLD	Delivery	Connolly, Christopher; Murphy, Chris-US IT; Irani-Famili, Reihaneh; Healy III, Kenneth	Solution Proposed	12/22/16	
19	Delays in Labor Union Engagement Could Impact workshop participation	Failure to engage represented employees in the as is/ to be design process could mean that critical information, observations and expert inputs are missing from the HLD process	M	M	HLD	Quality	Connolly, Christopher	Closed	10/21/16	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
20	Short term required compliance mitigation activities could negatively impact long term deployment activities	A disproportionate emphasis on short compliance fixes could consume the time, resources and expertise required to launch and sustain longer term fixes	M	H	Comp.	Delivery	McNamara, Daniel F.	Closed	12/22/16	10/20/16
21	Impact Analysis Deliverable Timeline	Impact Analysis milestone date misalignment may impact the downstream delivery of other CM deliverables.	L	L	BDR	BR/CM	Poyant, Ellen L.	Closed	10/3/16	10/7/16
22	Unplanned outages during Implementation	Implementation and subsequent RTB (Run the Business) activities for U.S. Gas Enablement core platforms and products will be impacted by unplanned outages. Program Increments, or releases may be delayed due to resource availability or lack of testing.	H	M	SDD	Schedule	Krantz, Ronald D.	In Progress	2/1/17	
23	Powerplan Disintegration	Implementation Roadmap and removing Powerplan integration from work order creation and work execution processes may impact business/implementation roadmap and cost of program.	H	H	SDD	Budget and Schedule Risk	Geer, William J.	Monitoring	12/22/16	
24	Inappropriate use of Agile Delivery Methods	Applying Agile delivery methods against current application platforms and reporting & analytics environments may be inappropriate. Causing project delays.	H	M	SDD	Scope	Krantz, Ronald D.	In Progress	12/22/16	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
25	Constrained Benefits by lack of SCM Implementation	ERP Supply Chain and Materials Management capabilities are not fully deployed. Assumed benefits may be at risk of being attainable.	M	H	PM	Benefits	Connolly, Christopher, Healy III, Kenneth	In Progress	12/2/16	
27	Network Bandwidth	Pain point indicated that wifi availability was not present in barns. Mobile/Disconnected mobility may require increased network bandwidth.	M	M	SDD	IS Solution Architecture	Krantz, Ronald	Solution Proposed	12/22/16	5/1/17
28	ECM and HPUM remaining capabilities not mapped	The remaining capabilities (back office, customer, etc) that are not mapped between NG Enterprise Capability Model and the Accenture Utility Model need to be mapped to ensure process/capability connectivity and in support of future impact analysis.	M	L	HLD	Enterprise Business Architecture/ Solution	Lyba, Svetlana	Solution Proposed	1/12/17	3/31/17
29	Data Accessibility	Data is often not accessible, and when it is the spreadsheets are often too large to work with. Data summary documents provided by data managers are often more useful than the data itself.	H	H	PM	Program	Del Santo, Edward	New	11/30/16	
30	Auto dialing or texting wrong customer number	There is a TPCA compliance change that puts us at risk when we auto dial or text customers and their phone number is not correct. Need data cleansed and controlled to ensure we are not being fined.	H	M	Comp.	Quality	Raad, Nick; Piccarreto, Megan	New	5/1/2017	



Risk Registry (continued)

ID	Risk	Description & Potential Impact	Probability	Impact	Impacted Item	Category	Assigned to	Status	Next Update	Mitigation Date
31	Benefits Identification	Benefits may not be as high / significant for a program / organization of this size and with respect to the starting point (e.g., 4th quartile in O&M/customer, Capital Unit Cost)	H	VH		PM	Del Santo, Edward; Connolly, Christopher	New	12/2/2016	
32	Benefits Buy In	Gas business leadership may not buy into / take ownership of identified benefits	H	VH		Delivery	Del Santo, Edward; Jones, Sandra; Johnston, Johnny	New	12/16/2016	
33	Risk of insufficient alignment between GBE and SOF	Risk that Supply Chain and overall GBE teams are not fully aligned with Shaping Our Future teams. There may be potential scope overlap/gap, critical dependencies, or even valuable inputs between GBE and SOF.	M	H	PM	SCM	Lynch, Joel	New	1/31/2017	
34	Customer Lens Impact during design and roll out	What mitigation/controls can we put in place to ensure that the customer focus is included in anything involving customer facing	M	M	BDR	Customer	Piccarreto, Megan; Connolly, Christopher	New	1/31/2017	
35	Support organizations (Call Center, AMO, Collections) will be required to use CIS and CRM	Full information is not being converted/visible into CRM for undetermined amount of time. This means the support groups will have to use 2 systems to get additional information/take action any time the field is involved. (ex. Make an appointment)	H	M	BDR	Customer	Piccarreto, Megan; Connolly, Christopher	New	1/31/2017	

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Steering Group Pack – External Distribution - Confidential



Johnny Johnston

19 January 2017 @ 1200 EST, Res Woods Board Room



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks Meeting Objectives Action Item Follow Up	5 min	JJ/KC
Executive Committee Materials	15 min	JJ
Regulatory Strategy Update	10 min	PV
Program Cost Reduction Options	10 min	JJ
Phase 2 Procurement Plan	10 min	NR
Program Update	5 min	KC
Meeting Close & Feedback	5 min	JJ



Meeting Objectives

1. Obtain feedback on the draft deck and questions for the February Group Executive Committee
2. Update on regulatory strategy and discuss options to enhance recovery
3. Discuss options available to reduce program costs
4. Gain endorsement of our approach on procurement activities for the next phase



Action Item Follow Up

	Action	Owner	Assigned	Due	Comment	Complete?
12	Provide a summary of actions taken / planned to address Business Assurance Partner observations	JJ	2 Dec	20 Dec	<ul style="list-style-type: none">Plan to be reviewed during 12/20 Steering Group meeting	Complete

For complete list see Appendix A



Agenda

<u>Topic</u>	<u>Time</u>	<u>Presenter</u>
Opening Remarks Meeting Objectives Action Item Follow Up	5 min	JJ/KC
Executive Committee Materials	15 min	JJ
Regulatory Strategy Update	10 min	PV
Program Cost Reduction Options	10 min	JJ
Phase 2 Procurement Plan	10 min	NR
Program Update	5 min	KC
Meeting Close & Feedback	5 min	JJ



Executive Committee Materials

- GBE has been asked to present at the February 16, Group Executive Committee
- Slides 7 – 30 in this pack are the draft story slides taking the feedback from the December Steering Group (Not planning on going through at Steering Group)
- We are currently drafting the Group Exec paper to answer the following questions:
 1. What is Gas Enablement and why is it needed now?
 2. What is your approach to the solution and are we doing anything unique?
 3. What is the investment, are there opportunities to reduce or defer it?
 4. What are the anticipated benefits and business case for this investment?
 5. What visibility/controls do we have to ensure the program does not go off track?
 6. What are the key risks to the program and how are you mitigating them?

Steering Group Discussion/Questions

- Any further feedback on the slide story, articulation and ask for Gas Business Enablement
- Do the questions above cover the key points or are there any other points that need to be answered?

CONFIDENTIAL

nationalgrid

Gas Business Enablement Program

Draft Presentation to the Group Executive Committee



February 16, 2017

CONFIDENTIAL



The US Gas Business is facing significant challenges that are putting our future growth at risk

We hold an unsustainable level of operational risk

- 90% of our 'front office' **systems will have reached end of life within 2 years**, making it increasingly more challenging to maintain reliability of critical operational systems.
- **Aging, disparate, and duplicative systems** impede a 'single version of the truth' making it difficult to demonstrate compliance, manage performance, and lack the flexibility to address a changing regulatory & customer environment.
- **\$40M in gas safety compliance penalties** received or in negotiation over the last 3 years, the majority of which could have been avoided with modern systems.
- **Gas safety compliance challenges** stem from not only systems gaps but also insufficient technical training and complicated work methods and procedures.

We need a step change in operational performance

- Our capital plan has tripled over recent years to \$2B a year and our **systems and Op Model need to be updated** to secure delivery.
- We **lack standard processes, performance metrics, and tools** to clearly understand current performance, report consistently to our regulators and support future regulatory frameworks.
- Our **customer are expecting more** (e.g., proactiveness) and **~%50 prefer web & mobile interactions** which we currently can't deliver.
- We **lack the resource capacity** to deliver the growth in capital spend as well as a **standard platform** to drive inorganic growth.
- A **culture of "make due"** and **diffuse accountability** for operating performance is the norm.

Our market framework is changing dramatically

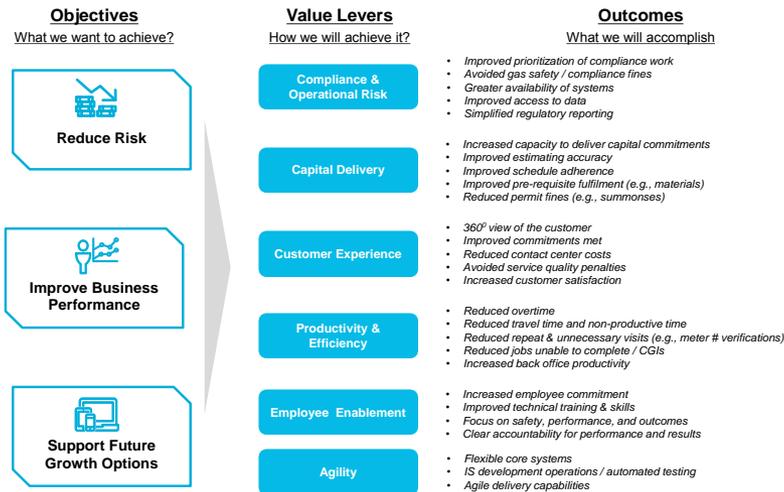
- Incidents resulting in significant cost to gas utilities are **increasing regulator scrutiny and requirements** (e.g., API1173).
- **Public sentiment** on gas is changing (e.g., environmental).
- **Competition and opportunities** from alternative energy sources continue to evolve and become economically viable.
- The **impact of digital on energy system** is transforming how utilities go to market and operate.

8

CONFIDENTIAL



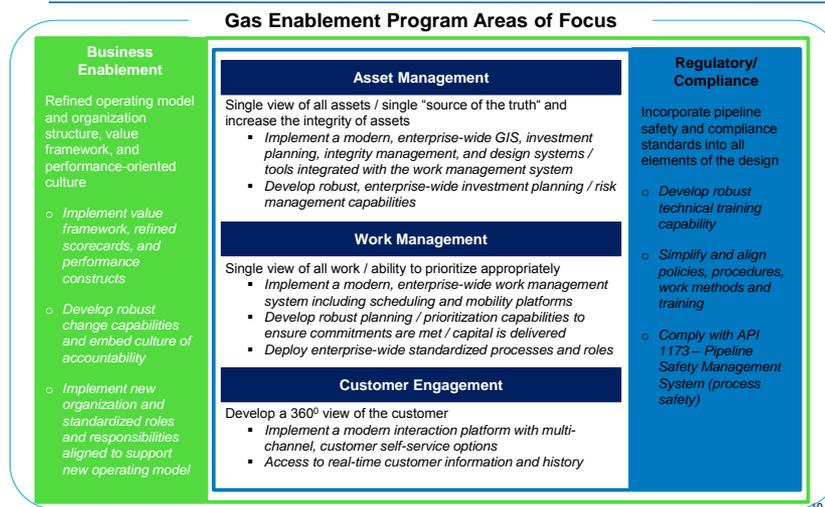
The program is designed to deliver on three primary objectives to address these challenges



CONFIDENTIAL



To meet these objectives, a holistic transformation program is required to modernize systems, standardize & align processes, and build the capabilities of our people



CONFIDENTIAL



To ensure the success of the program, we will leverage innovative approaches, modern delivery methods, and robust governance

<p>Innovative release approaches <i>that segment the program into manageable scope elements.</i></p> 	<ul style="list-style-type: none">Standardize processes and roles ahead of systems to reduce complexitySegment implementation by work type (e.g., Corrosion, I&R) to reduce risk & impact to the business & our customersRegionalize implementation leveraging RI as a "test bed concept" to demonstrate successful implementation and bundle proven capabilities for scale rollout to other jurisdictions to avoid regressing of capabilities
<p>Modern delivery methods <i>to improve the likelihood of success and avoid stranding assets.</i></p> 	<ul style="list-style-type: none">Agile development where appropriate, starting with and building out minimally viable products to reduce complexity and increase speed to valueCloud and software as a service (SaaS) solutions where possible to minimize the need to stand up and maintain expensive and complex infrastructure
<p>Robust governance mechanisms <i>to ensure the program remains on track.</i></p> 	<ul style="list-style-type: none">Critical success factors to measure and monitor progressAnnual sanction process to provide optionality throughout programFormal stage gates to manage deployment risk to jurisdictionsFocus on realizing value

CONFIDENTIAL



Four options were assessed, the value-oriented program that optimizes scope, value and risk is recommended

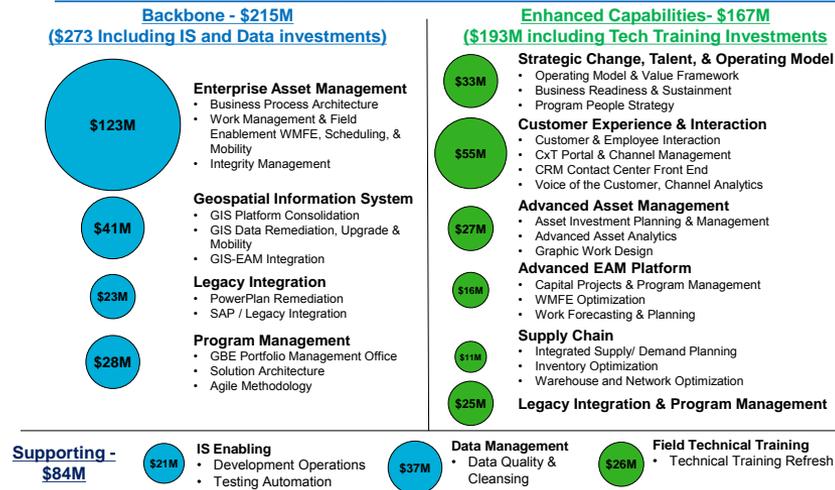
<i>Option</i>	<i>Characteristics</i>	<i>Disposition</i>
<p>1</p> <p>Tech Stabilization Only</p>	<ul style="list-style-type: none"> • Focus on stabilizing current systems to reduce risk profile • Postpones required core work and asset platform replacement • No foundation for the future 	<ul style="list-style-type: none"> • Not sufficient to deliver strategic ambition • Not further detailed analysis required
<p>2</p> <p>Backbone Only</p> <p><i>FY18 Spend: \$100M</i></p>	<ul style="list-style-type: none"> • Scope limited to what is required to mitigate key risks • Focused on replacing core work and asset platforms • Simplifies, reduces implementation and risk • Limited foundation for the future 	<ul style="list-style-type: none"> • Focused on operational risk only • Not sufficient to deliver our broader strategic ambition • Represents a "fall back" option to option #3, with reduced value/benefits
<p>3</p> <p>Value Oriented</p> <p><i>FY18 Spend: \$134M</i></p>	<ul style="list-style-type: none"> • Backbone plus enhanced capabilities to meet objectives • Prioritized investment over 5 years to deliver value • Initial focus on risk reduction • Annual decisions points to create optionality • Addresses risk and desired business performance 	<ul style="list-style-type: none"> • Addresses operational risk • Sufficient to deliver strategic ambition • Optimized scope, value, and risk • Recommended for approval
<p>4</p> <p>"Big Bang" Approach</p>	<ul style="list-style-type: none"> • Comprehensive platform & capability scope in 3 years • Minimized deployment time creates delivery risk • Risk that desired performance improvements aren't achieved • Challenges our capability to deliver 	<ul style="list-style-type: none"> • Although sufficient to deliver strategic ambition, approach not aligned with future direction (e.g., agile, reduce delivery risk, etc.) • Not further detailed analysis required

Options deemed not viable

CONFIDENTIAL



The value-oriented approach includes the required ‘backbone’ investment supplemented by enhanced and supporting capabilities

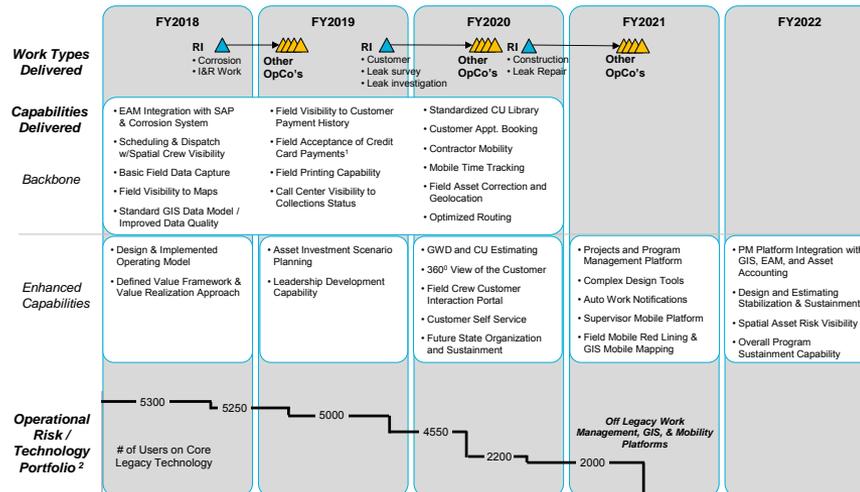


○ Size indicates relative cost of initiatives / initiative groupings

CONFIDENTIAL



This program will deliver the backbone over three years, prioritized to reduce operational risk and deliver enhanced capabilities over five years

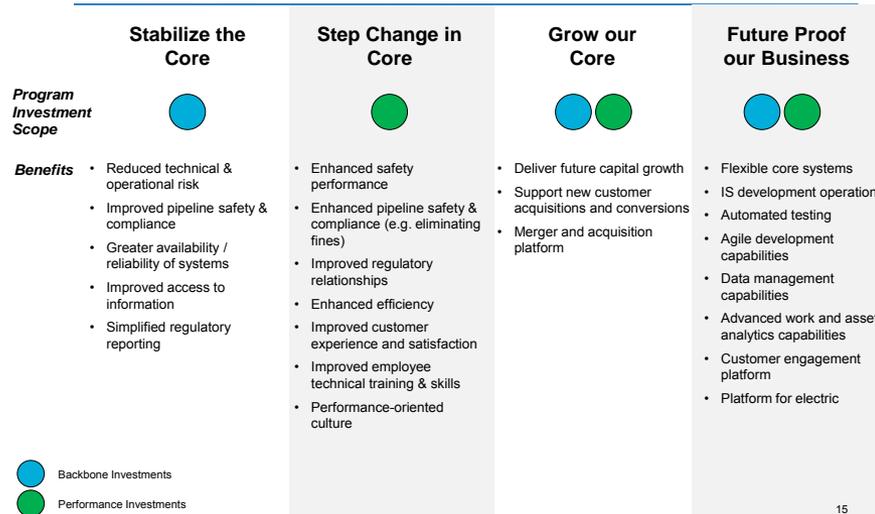


¹ Pending Regulatory Approval
² Legacy backbone applications estimated to go from 42 out of 117 total applications currently to 6 out of 22 post implementation

CONFIDENTIAL



This program delivers a broad range of benefits to address the challenges of today while positioning the Gas Business for the future



CONFIDENTIAL

DRAFT ONLY



The investment in enhanced capabilities necessary to enable a step change in the core will create significant benefit opportunities

Enhanced Capabilities	Value Drivers	Example Metrics ¹	Aspirational Ann. Benefit (Ms)
Strategic Change, Talent, & Operating Model	<ul style="list-style-type: none"> Process efficiency Improved performance mgmt. Performance culture 	<ul style="list-style-type: none"> Supervisor time in the field Quality of coaching conversations 	N/A ²
Customer Experience & Interactions	<ul style="list-style-type: none"> Self-service New service growth Increased customer satisfaction 	<ul style="list-style-type: none"> Services initiated via self-service Move requests completed via self-service Status updates received via self-service Service quality penalties Contact center call volume Average time per contact center call 	\$2.4
Asset Management	<ul style="list-style-type: none"> Reduced material spend Reduced opex spend reduction Capex effectiveness 	<ul style="list-style-type: none"> Estimating accuracy Mapping cycle time Opex spend Risk reduced / \$ spent 	\$4.1
EAM / Work Management Platform	<ul style="list-style-type: none"> Appointments met / kept Increase Supervisor time in field Route optimization Reduced overtime Reduced contractor spend Back office productivity Improved operational data 	<ul style="list-style-type: none"> Unable to complete rate Schedule adherence Jobs scheduled / dispatched automatically # / rate of jobs bundled Travel time Available / idle time Pre-requisite fulfillment rate Summonses / other penalties 	\$16.7
Supply Chain	<ul style="list-style-type: none"> Reduced capex project delays Reduced material spend Reduced inventory carrying costs 	<ul style="list-style-type: none"> Material stock-outs Rate of jobs requiring expedite Inventory turnover Inventory carrying cost 	N/A
Field Technical Training	<ul style="list-style-type: none"> Reduced compliance violations Reduced compliance penalties 	<ul style="list-style-type: none"> # / type compliance violations Penalties incurred 	\$13.5
			\$36.7

¹ Performance metrics to be defined as part of value framework in Q1 2017

² Capabilities increase likelihood of program success and enhance the probability of delivering program benefits.

CONFIDENTIAL

INTERNAL DRAFT ONLY – ANALYSIS ON-GOING



Regulatory recovery is the core funding mechanism; strategy being developed to minimize regulatory lag

The investments identified in GBE are investments to support core delivery for our customers and so would be traditionally funded by customers through rate agreements. There are a number of issues that make 100% funding a challenge for GBE:

- GBE is currently not in any rate cases so 2017 Opex would not be recoverable
- The next KEDNY/LI rate year is 2020 and so any Opex or depreciation expense before then will be a challenge to recover
- Massachusetts only has backward looking rate cases which will make Opex recovery beyond the test year challenging to recover

4 options main options are being assessed identify optimal recovery strategy:

- | | | | |
|--|---|--|---|
| 1. Traditional Recovery <ul style="list-style-type: none">■ High probability of delivery■ Anticipated recovery: ~75% total costs | 2. Program Delay/Slow Down – better aligns costs with future rate cases <ul style="list-style-type: none">■ High probability of delivery■ Business impact due to being on failing legacy systems for longer■ Anticipated recovery: ~80+% total costs | 3. Enhanced Regulatory Recovery (secure forward looking MA rate case & incremental recovery for KEDNY/LI) <ul style="list-style-type: none">■ Low probability of delivery■ Anticipated recovery: ~90+% total costs | 4. Bankers Lease financing – fund program costs through a bankers lease arrangement – allowing better alignment of lease repayments to rate cases <ul style="list-style-type: none">■ High probability of delivery■ Anticipated recovery: ~90+% total costs■ Any under recovery better aligns to when broader benefits are being delivered |
|--|---|--|---|

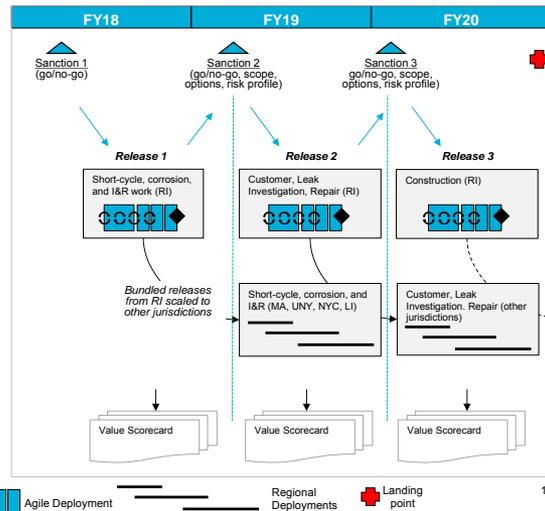
CONFIDENTIAL



Governance mechanisms and deployment approaches provide optionality to adjust scope and funding over time

Governance Mechanisms

- Annual sanctioning with scope decisions provides options to course correct
- Formal stage gates manage deployment risk to jurisdictions
 - Using Rhode Island as test bed allows for validation of performance as input into stage gate decisions
 - Agile deployment delivering minimal viable products allows for proof of concept as input into stage gate decisions
- Performance framework defines measurable results of releases and waves
 - Using value scorecards allows for value to be achieved as input into stage gate / sanctioning decisions

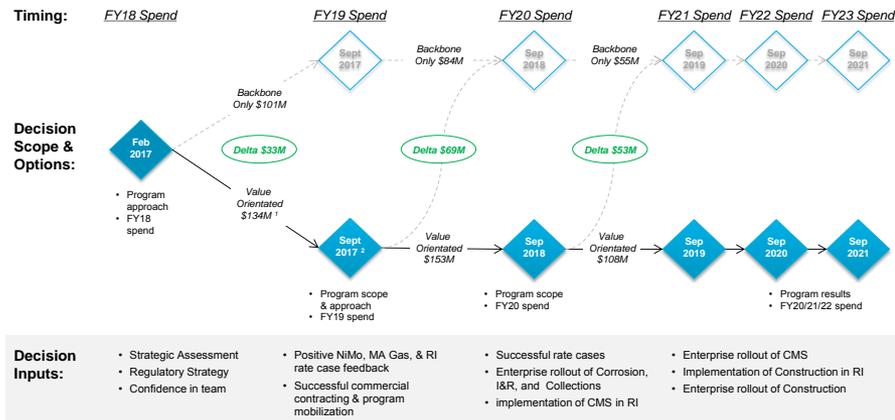


CONFIDENTIAL



Annual sanctions give clear visibility to incremental investment decisions beyond the backbone

The key decision now involves an incremental \$33M to support the value-oriented option, pending further clarification of initial results and commercial approach.



CONFIDENTIAL



Program risks will be actively monitored and mitigation plans developed and executed

Risk	Definition	Mitigations
Business disruption	The program causes performance of the business to be reduced because of disruptions to operations	<ul style="list-style-type: none"> Disciplined release planning anticipates complications Change Office reinforces disciplined role and change planning
Market context	Capabilities delivered lose relevance because of dramatic changes in market and or regulatory environment	<ul style="list-style-type: none"> Waves revisits context of each investment Agile approaches improve relevance of solution approach
Change in strategic priorities	Business priorities change over time and reduce priority for further program investments	<ul style="list-style-type: none"> Sanction schedule provides for regular investments Input from US leadership and Group Executive Ongoing input from GBE steering group
Sustainment of performance and value	Program fails to realize sustainable improvement in the performance of the business	<ul style="list-style-type: none"> Value framework identifies specific performance parameters for every initiative Operating Model strengthens accountability framework for the business
Capacity for change	Organizational inertia and culture prevents program from achieving required pace of change	<ul style="list-style-type: none"> Change office and ongoing organizational health metrics to diagnose organizational state GBE manages change portfolio for gas business
Scope creep	Scope and cost of program increases because of failure to stay focused on objectives	<ul style="list-style-type: none"> Value framework helps manage scope/value tradeoffs Agile approaches help identify most relevant solutions Sanctioning waves allow total costs to be reevaluated
Data quality	Cost and complexity of data conversion and cleansing is much greater than anticipated	<ul style="list-style-type: none"> Data discovery allows bottom up profiling of data and data quality
Resources / Capabilities	Business is unable to provide adequate resources and delivery capabilities to successfully manage the program	<ul style="list-style-type: none"> Resource plan has manageable rampup Robust commercial process to find partners with desired capability at the right price

CONFIDENTIAL



The Group Executive Committee are asked to:

1. Approval

- Approve a budget of \$134M (+\$16M contingency) for FY18 to start the Value Oriented Roadmap and proposed regulatory recovery strategy
- Note that the program will be asking for approval for FY19 in September 2018 and that there will be a three-year funding commitment to complete the backbone

2. Gas Business Enablement Roadmap

- Endorse the proposed Value Orientated Gas Business Enablement roadmap and business case. Noting that this is a risk-prioritized asset replacement program costing \$466M (\$527M including contingency) over 5 years made up of \$277M to replace the backbone systems and \$189M for enhanced capabilities. Note the aspirational annual benefits of \$36M a year.

3. Sanctioning Approach

- Endorse the proposed sanctioning approach of annual requests for funding to ensure the program is being appropriately delivered and prioritized to continue to meet business, regulatory, and customer requirements

4. Governance

- Delegate Authority to the GBE Steering Group (Dean Seavers, Rich Adduci, Peggy Smyth, Vivienne Bracken, John Bruckner, Keith Hutchinson & Lorraine Lynch) to continue oversight of the GBE program

CONFIDENTIAL

nationalgrid

Appendix

CONFIDENTIAL



Key initiatives

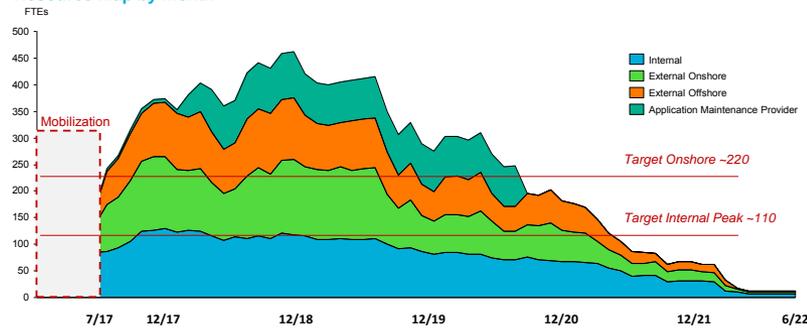
Workstreams	Initiatives					
GBE Portfolio Office						
Business Enablement	Program Level People Strategy	Operating Model & Value Framework	Program Business Readiness & Sustainment	Leadership Capability		
Work Management	Process Architecture	Work Management and Field Enablement	Work Management Analytics	Projects & Program Management		
Asset Management	Engineering, Design, Estimating & Mobility	Asset Investment Planning and Management	Integrity Management	Asset - Advanced Analytics		
Regulatory/ Compliance	Standards Operating Procedure Documentation	Document Management	Technical Training			
Customer Engagement	Customer Interaction	Customer Employee Journey	CRM / Contact Center	Channel Analytics		
Data Management	Data Management	Data Quality & Cleansing	Remediation & Integration			
Supply Chain	SC Process Architecture	Integrated Supply & Demand Planning	Capability Building	SC Master Data Improvements	Inventory Optimization	Warehouse & Network Optimization
Information Systems Enabling						

CONFIDENTIAL



Resource plan

Resource Map by Month¹



Internal Resource Requirements

	% of Total	Target on 9/2017	Current on 12/2016
Business	45%	50	24
IS	36%	40	9
PM	19%	20	7
Total	100%	110	40

¹Source: GBE Master Resource Plan V17 12/14/16

CONFIDENTIAL



Total investment breakdown: \$446M (Capex \$251M, Opex \$215M), \$527M including contingency

Initiative Category	Backbone \$Ms	Performance \$Ms	Supporting Investments \$Ms	Total Cost \$Ms ^{1,2}	% of Total Investment
Advanced Asset Management		\$27		\$27	6%
Advanced EAM Platform		\$16		\$16	3%
Core EAM Platform	\$123			\$123	26%
Customer Experience & Interactions		\$55		\$55	12%
Data Management			\$37	\$37	8%
Field Technical Training			\$26	\$26	6%
GIS	\$41			\$41	9%
IS Enabling			\$21	\$21	5%
Legacy Integration	\$23	\$11		\$34	7%
Program Management	\$28	\$15		\$43	9%
Strategic Change, Talent, & Operating Model		\$33		\$33	7%
Supply Chain		\$11		\$11	2%
Total before Contingency	\$215	\$167	\$84	\$466	
% of Total	46%	36%	18%		
Contingency				\$61	
Total				\$527	

¹ Costs include expenses (17% external, onshore labor cost; 10% internal labor costs); cost includes HW/SW

² Average Daily Rates: NG - \$845; External - \$1,001 (External Onshore - \$1,711; External Offshore - \$326)

³ Contingency equals 20% applied to labor cost only; not applied to support (RTB) costs

CONFIDENTIAL



**Year one investment breakdown: \$134M (Capex \$77M, Opex \$57M),
\$149M including contingency**

Initiative Category	Backbone \$Ms	Performance \$Ms	Supporting Investments \$Ms	First Year Cost \$Ms ^{1, 2}
Advanced Asset Management		\$2.6		\$2.6
Advanced EAM Platform		\$0.2		\$0.2
Core EAM Platform	\$44.5			\$44.5
Customer Experience & Interactions		\$2.1		\$2.1
Data Management			\$13.2	\$13.2
Field Technical Training			\$3.2	\$3.2
GIS	\$15.6			\$15.6
IS Enabling			\$7.5	\$7.5
Legacy Integration	\$11.7	\$6.6		\$18.3
Program Management	\$7.9	\$4.2		\$12.1
Strategic Change, Talent, & Operating Model		\$11.3		\$11.3
Supply Chain		\$3.1		\$3.1
Total before Contingency	\$79.7	\$30.1	\$23.9	\$133.7
% of First Year Cost	60%	23%	18%	
Contingency				\$15.7
Total				\$149.4

¹ Costs include expenses (17% external, onshore labor cost; 10% internal labor costs); cost includes HW/SW

² Average Daily Rates: NG - \$845; External - \$1,001 (External Onshore - \$1,711; External Offshore - \$326)

³ Contingency equals 20% applied to labor cost only; not applied to support (RTB) costs

CONFIDENTIAL



Investment by OpCo by FY by CapEx and Opex

CapEx Allocated to OpCo's by FY

OpCo	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
Boston Gas	(\$17,800)	(\$18,216)	(\$14,750)	(\$6,343)	(\$1,411)	(\$54)	(\$58,574)
Brooklyn Union Gas (KEDNY)	(\$23,005)	(\$23,542)	(\$19,063)	(\$8,198)	(\$1,823)	(\$70)	(\$75,701)
Colonial Gas	(\$3,982)	(\$4,075)	(\$3,300)	(\$1,419)	(\$316)	(\$12)	(\$13,103)
Keyspan Gas East (KEDLI)	(\$16,470)	(\$16,855)	(\$13,648)	(\$5,869)	(\$1,305)	(\$50)	(\$54,198)
Narragansett Gas	(\$5,663)	(\$5,796)	(\$4,693)	(\$2,018)	(\$449)	(\$17)	(\$18,636)
NiagaraMohawk Gas	(\$9,508)	(\$9,730)	(\$7,879)	(\$3,388)	(\$754)	(\$29)	(\$31,286)
Total CapEx	(\$76,427)	(\$78,212)	(\$63,334)	(\$27,235)	(\$6,058)	(\$234)	(\$251,499)

Opex Allocated to OpCo's by FY

OpCo	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
Boston Gas	(\$13,336)	(\$17,471)	(\$10,334)	(\$6,241)	(\$2,417)	(\$189)	(\$49,989)
Brooklyn Union Gas (KEDNY)	(\$17,236)	(\$22,580)	(\$13,356)	(\$8,065)	(\$3,124)	(\$245)	(\$64,606)
Colonial Gas	(\$2,983)	(\$3,908)	(\$2,312)	(\$1,396)	(\$541)	(\$42)	(\$11,183)
Keyspan Gas East (KEDLI)	(\$12,340)	(\$16,166)	(\$9,562)	(\$5,774)	(\$2,237)	(\$175)	(\$46,254)
Narragansett Gas	(\$4,243)	(\$5,559)	(\$3,288)	(\$1,985)	(\$769)	(\$60)	(\$15,905)
NiagaraMohawk Gas	(\$7,123)	(\$9,332)	(\$5,520)	(\$3,333)	(\$1,291)	(\$101)	(\$26,701)
Total Opex	(\$57,262)	(\$75,015)	(\$44,373)	(\$26,795)	(\$10,380)	(\$813)	(\$214,637)

Total CapEx and Opex Allocated to OpCo's by FY

OpCo	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
Boston Gas	(\$31,136)	(\$35,687)	(\$25,085)	(\$12,584)	(\$3,828)	(\$244)	(\$108,563)
Brooklyn Union Gas (KEDNY)	(\$40,240)	(\$46,121)	(\$32,420)	(\$16,263)	(\$4,948)	(\$315)	(\$140,307)
Colonial Gas	(\$6,965)	(\$7,983)	(\$5,612)	(\$2,815)	(\$856)	(\$55)	(\$24,286)
Keyspan Gas East (KEDLI)	(\$28,810)	(\$33,020)	(\$23,211)	(\$11,643)	(\$3,542)	(\$226)	(\$100,452)
Narragansett Gas	(\$9,906)	(\$11,354)	(\$7,981)	(\$4,004)	(\$1,218)	(\$78)	(\$34,541)
NiagaraMohawk Gas	(\$16,631)	(\$19,061)	(\$13,399)	(\$6,721)	(\$2,045)	(\$130)	(\$57,987)
Total	(\$133,689)	(\$153,227)	(\$107,706)	(\$54,030)	(\$16,437)	(\$1,047)	(\$466,136)

CONFIDENTIAL

DRAFT ONLY



Aspirational Annual Benefits by Category by Capex / Opex and by Type¹

Area		Threshold Benefit	Target Benefit	Stretch Benefit
Customer Experience & Interactions	Total	\$2.4	\$3.0	\$3.9
	CapEx:	\$0.0	\$0.0	\$0.0
	Opex:	\$2.4	\$3.0	\$3.9
	Type 1:	\$0.9	\$0.9	\$0.9
	Type 2:	\$1.5	\$2.1	\$3.0
Asset Management	Total	\$4.1	\$8.6	\$12.6
	CapEx:	\$0.9	\$5.0	\$7.2
	Opex:	\$3.2	\$3.6	\$5.4
	Type 1:	\$2.0	\$4.4	\$6.6
	Type 2:	\$2.1	\$4.2	\$6.0
EAM / Work Management Platform	Total	\$16.7	\$31.7	\$63.0
	CapEx:	\$7.3	\$14.0	\$32.5
	Opex:	\$9.4	\$17.7	\$30.5
	Type 1:	\$2.0	\$2.0	\$14.2
	Type 2:	\$14.7	\$29.7	\$48.8
Supply Chain	Total	\$0.0	\$16.0	\$38.4
	CapEx:	\$0.0	\$13.1	\$33.1
	Opex:	\$0.0	\$3.0	\$5.3
	Type 1:	\$0.0	\$0.0	\$0.0
	Type 2:	\$0.0	\$16.0	\$38.4
Field Technical Training	Total	\$13.5	\$13.5	\$13.5
	CapEx:	\$0.0	\$0.0	\$0.0
	Opex:	\$13.5	\$13.5	\$13.5
	Type 1:	\$0.0	\$0.0	\$0.0
	Type 2:	\$13.5	\$13.5	\$13.5
Totals	Total	\$36.7	\$72.6	\$131.4
	CapEx:	\$8.2	\$32.1	\$72.8
	Opex:	\$28.5	\$40.8	\$58.6
	Type 1:	\$4.9	\$7.3	\$21.7
	Type 2:	\$31.8	\$65.5	\$109.7

¹ Type 1 benefits have a direct and certain impact on the bottom line and a clear cause and effect relationship between the project and benefit; direct P&L impact
Type 2 benefits do not have a direct and immediate bottom line impact; they consist of expenses re-assigned, resources freed up, or future cost avoidance 28

CONFIDENTIAL



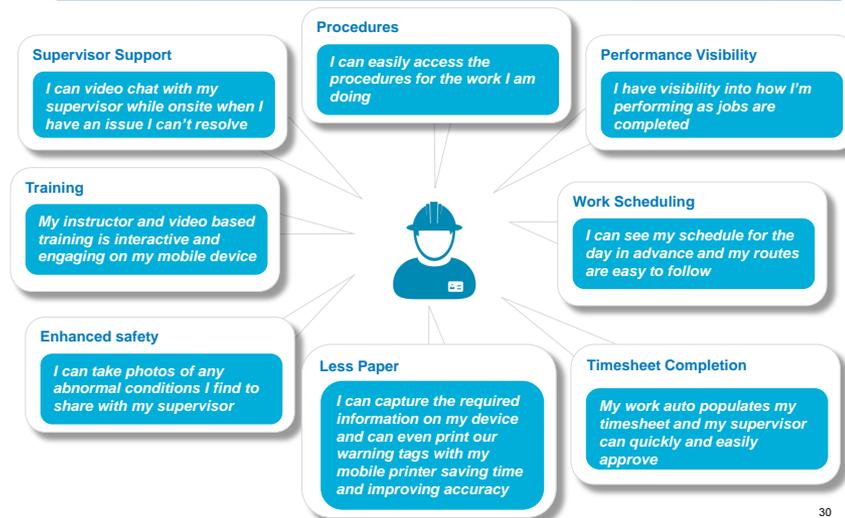
Example customer experience benefits



CONFIDENTIAL



Example employee experience benefits



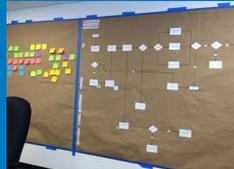
30

CONFIDENTIAL

nationalgrid

Gas Business Enablement

Steering Group Pack



Johnny Johnston

6 February 2017

nationalgrid

Note to File...

The objective of this special session of the Steering Group was to gather feedback on a draft of the paper to be presented on 16 Feb 2017 to the Group Executive for executive level sanction of the GBE Program. There was no presentation deck for this SG meeting.



National Grid Gas Business Enablement Program

Business Case Deliverable
December 9, 2016

CONFIDENTIAL



Strategy | Consulting | Digital | Technology | Operations

CONFIDENTIAL

Contents



- Executive Summary
- Program Context
- Options Considered & Recommendation
- Recommended Option Scope, Benefits, and Costs
- Appendix

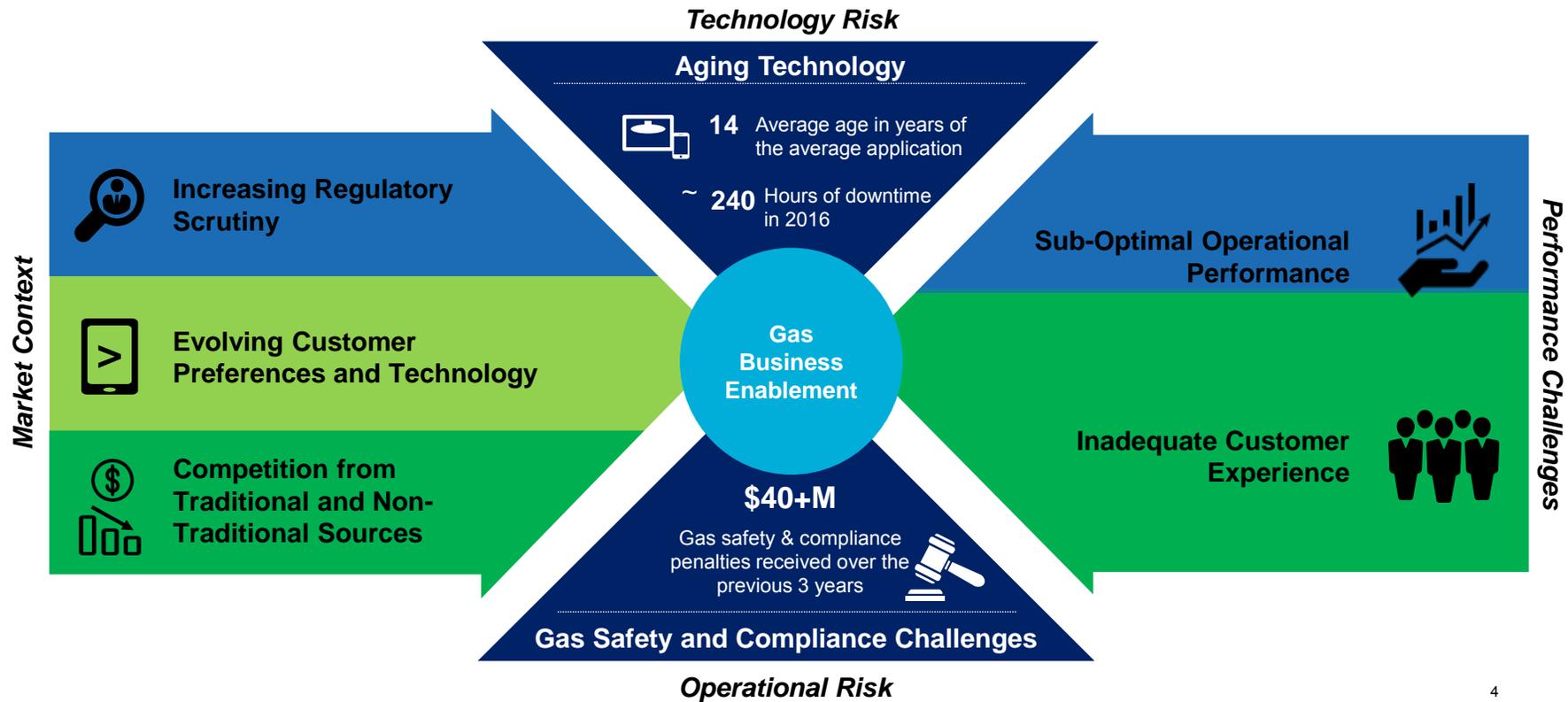
Executive Summary

CONFIDENTIAL



National Grid is proposing a gas business enablement program to address aging technology and gas safety and compliance challenges, improve performance, enhance the customer experience, and be able to adapt to a changing market framework.

CONFIDENTIAL



CONFIDENTIAL



Of the five options that were evaluated, the jurisdiction deployment value oriented option best addresses National Grid’s challenges and reduces delivery risk by deploying capabilities by jurisdiction.

<u>Option</u>	<u>Characteristics</u>	<u>Duration</u>	<u>Investment</u>
1 Tech Stabilization	<ul style="list-style-type: none"> Continue to provide limited support for the current systems Upgrade supporting infrastructure where possible 	<ul style="list-style-type: none"> Likely 3+ years ¹ 	\$15M to \$20M ³
2 Like for Like Replacements	<ul style="list-style-type: none"> Upgrade or replace current systems, where possible Limited system consolidation; stand alone systems not integrated No capability, process, or people / leadership improvements Does not include improvements in data quality or technical training 	<ul style="list-style-type: none"> Likely 4+ years ² 	\$221M+ ⁴
3 Backbone	<ul style="list-style-type: none"> Focused on replacing core AM/WM systems Capability & process improvements limited to work and asset mgmt. Scope limited to what is required to mitigate key risks 	<ul style="list-style-type: none"> 3 ½ years 	\$273M
4 Value Oriented – Jurisdiction Deployment	<ul style="list-style-type: none"> Backbone scope + enhanced capabilities; initial focus on risk reduction Enhanced capabilities include strategic change, talent, & operating model, customer interaction, advanced asset & work management, supply chain, & technical training Addresses data quality and technical training gaps Transitions support and maintenance to a modern SaaS model Deployment by jurisdiction to allow for refinements prior to broader rollout 	<ul style="list-style-type: none"> 5 years 	Total: \$458M Enhanced Capabilities: \$185M
5 Value Oriented – Accelerated Deployment	<ul style="list-style-type: none"> Same as above except program accelerates delivery of capabilities Takes more aggressive deployment approach 	<ul style="list-style-type: none"> 4 ½ years 	Total: \$466M Enhanced Capabilities: \$193M

¹ Potential IS budgetary / O&M constraints will influence timeframe

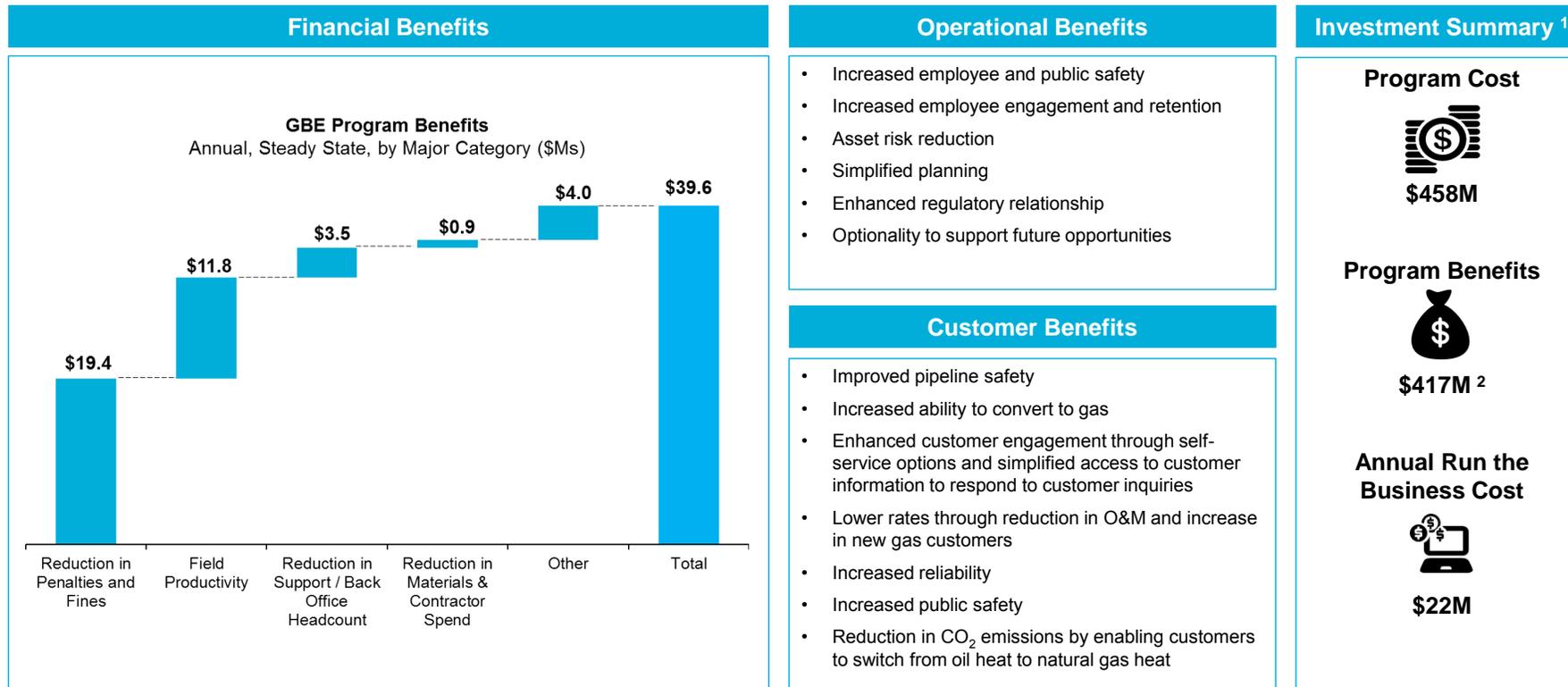
² Assumes longer duration than backbone due to lack of system consolidation; more applications need to be replaced, upgraded, or remediated than in the backbone scenario

³ Tech stabilization investment assumes \$200K per application which includes infrastructure and application updates

⁴ Like for like investment assumes major business and operational critical applications can be upgraded, remediated or replaced and are estimated as such; for custom and older technology with no replacement in the market, investment is assumed to be \$200K for stabilization / remediation and \$350K for upgrade per application

The jurisdiction deployment value oriented option delivers significant benefits over the useful life of the assets and financial benefits and considerably improves the customer experience.

CONFIDENTIAL



¹ Costs and benefits are in nominal terms

² Capabilities assumed to be fully deployed in FY21; benefits accumulated from FY19 to FY31 – benefits start prior to full deployment of capabilities

Program Context

CONFIDENTIAL



CONFIDENTIAL

The US Gas Business carries an unsustainable level of operational risk driven by aging technology and gas safety and compliance challenges.



Aging Technology

- Average age of the application portfolio is 14 years with some applications at 26 years
- 90% of the 'front office' systems will have reached end of life within 2 years
- Critical applications have missed availability targets 35% of the time causing ~240 hours of down¹
- 99 disparate systems make it difficult to plan, manage, and report on compliance work

Gas Safety and Compliance Challenges

- In 2016, Internal Audit and two third party assessments² by industry experts identified significant gaps in gas field technical training governance, curriculum, and delivery, including lack of modern instructional design and technology
- In 2015, National Grid agreed to a Compliance Plan with the Mass. DPU based on systemic non-compliance associated with not completing mandated work in fifteen (15) program areas, paid a \$450K fine (total exposure was \$30M), and agreed to certain hiring, training, and qualification processes for field employees and Supervisors.
- Gas standards and procedures, although technically sound, are difficult for field workers to follow and not always aligned with training materials, leading to procedural non-compliance.
- \$40+M in gas safety and compliance penalties have been received or are in negotiation over the last 3 years
- The total annual gas safety and compliance penalty exposure is more than \$76M in NY and is largely unlimited in MA and RI with \$2M maximum cap per violation

Operational risk impacts our ability to support safe, compliant operations and meet ongoing regulatory obligations.

¹ A small # of applications are monitored for performance as many do not have SLAs for maintenance; timeframe Dec 15 through Dec 16

² Pipeline Performance Improvement Company (P-Pic) performed a pipeline safety/compliance review utilizing API RP 1173. In addition, the Mosaic Company performed an assessment of our Field Technical Training program and developed recommended actions/roadmap to close significant gaps identified. Recommendations to improve our Pipeline Safety Management System and Field Technical Training are being incorporated into the GBE effort.

CONFIDENTIAL

In addition, a step change is needed to improve operational performance and enhance the customer experience.



Operational Performance

- Disparate systems and heavy reliance on paper negatively impact our O&M and capital unit cost performance ¹
- Inefficiencies driven by inadequate technology, non-standard processes, reliance on paper, and a “make due” culture impact our ability to achieve allowed ROE and TSR targets ²
- Operating model, system, and process improvements are needed to secure the delivery of our current \$2B capital spend plan
- Increase in capital spend has materially reduced resource capacity limiting our ability to support additional growth opportunities (e.g., customer gas conversions)
- Non-standard processes and disparate tools limit our ability to understand performance results and course-correct as necessary.



Customer Experience and Value



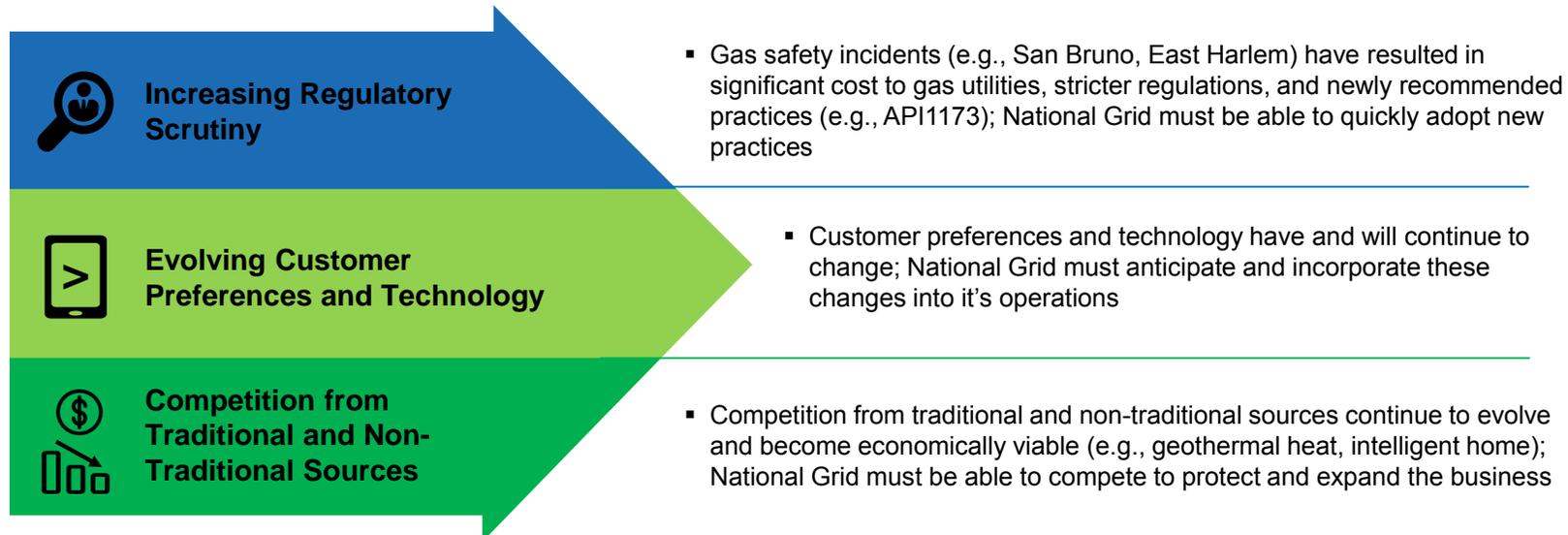
- Disparate systems and information limit our ability to provide customers with status and other pertinent information in a timely manner
- Many customer inquiries take multiple interactions to resolve / address
- Lack of resource capacity limits our ability to meet the demand for new gas connections and conversion requests
- Lack of a modern, digital platform for effective and efficient interaction make it increasingly difficult for our customers to do business with us
- Customer preferences for communication (e.g., text message, apps) can't be met with the current suite of capabilities and platforms
- Inefficient operations has negatively affected our ability to meet all customer commitments including appointments

¹ Accenture analysis using 2015 AGA data reported by National Grid

² ROE is below allowed in all operating companies with exception of Brooklyn Union Gas Company; TSR and ROE Source: SNL Financial

CONFIDENTIAL

Finally, more flexible capabilities and platforms are needed to address the dramatically changing market framework.



CONFIDENTIAL



As a result of the challenges faced, a Gas Business Enablement program was developed to reduce risk, improve business performance, and support future growth.



Options Considered & Recommendation



CONFIDENTIAL

CONFIDENTIAL

Five Gas Business Enablement program options were assessed each differing in scope and characteristics.



<u>Option</u>	<u>Characteristics</u>	<u>Duration</u>
1 Tech Stabilization	<ul style="list-style-type: none"> Continue to provide limited support for the current systems Upgrade supporting infrastructure where possible 	<ul style="list-style-type: none"> Likely 3+ years Potential IS budgetary / O&M constraints will influence timeframe
2 Like for Like Replacements	<ul style="list-style-type: none"> Upgrade or replace current systems, where possible Limited system consolidation; stand alone systems not integrated No capability, process, or people / leadership improvements Does not include improvements in data quality or technical training 	<ul style="list-style-type: none"> Likely 4+ years Assumes longer duration due to potential IS capacity constraints & dependencies
3 Backbone	<ul style="list-style-type: none"> Focused on replacing core AM/WM systems Capability & process improvements limited to work and asset mgmt. Scope limited to what is required to mitigate key risks 	<ul style="list-style-type: none"> 3 ½ years
4 Value Oriented – Jurisdiction Deployment	<ul style="list-style-type: none"> Backbone scope + enhanced capabilities; initial focus on risk reduction Capability, process, and people / leadership improvements Addresses data quality and technical training gaps Transitions support and maintenance to a modern SaaS model Deployment by jurisdiction to allow for refinements prior to broader rollout 	<ul style="list-style-type: none"> 5 years
5 Value Oriented – Accelerated Deployment	<ul style="list-style-type: none"> Same as above except program accelerates delivery of capabilities Takes more aggressive deployment approach 	<ul style="list-style-type: none"> 4 ½ years

CONFIDENTIAL

Each option was evaluated against National Grid’s objectives to determine which option best addresses the challenges faced and is the most prudent investment.



Objectives

Evaluation Criteria

The solution must...



Reduce Risk

- Improve Gas Safety and Compliance Performance
- Secure Delivery of Capital Spend Plan
- Improve Application Availability / Reduce Downtime



Improve Business Performance

- Improve Efficiency and Productivity
- Improve the Customer Experience
- Simplify Data Management / Improve Data Quality
- Enable Quick Response to Regulatory Requests / Changes
- Enable Consistent Measurement of Performance / Continuous Improvement



Support Future Growth

- Establish a Common Platform
- Standardize Capabilities, Processes, and Practices
- Establish a Platform to Enable an Electric Business Enablement & Future Enhancements

CONFIDENTIAL



Three options partially or fully meet all three objectives and were further evaluated.

Option	Reduces Risk	Improves Business Performance	Supports Future Growth
1 Tech Stabilization	<ul style="list-style-type: none"> Limited impact to application availability No impact on gas safety and compliance risk No impact on capital delivery 	<ul style="list-style-type: none"> No impact on efficiency and productivity, the customer experience, data management / data quality, regulatory response, and performance measurement 	<ul style="list-style-type: none"> Disparate platforms Non-standardized capabilities, processes, and practices No platform for electric business enablement or future enhancements
2 Like for Like Replacements	<ul style="list-style-type: none"> Moderate impact to application availability No impact on gas safety and compliance risk No impact on capital delivery 	<ul style="list-style-type: none"> Focuses on technology replacements / upgrades only No impact on efficiency and productivity, the customer experience, data management / data quality, regulatory response, and performance measurement 	<ul style="list-style-type: none"> Disparate platforms Non-standardized capabilities, processes, and practices No platform for electric business enablement or future enhancements
3 Backbone	<ul style="list-style-type: none"> Improves application availability Partially addresses operational challenges; gas safety and compliance Improved work management systems supports capital delivery 	<ul style="list-style-type: none"> Moderate impact on efficiency and productivity No impact to the customer experience Simplifies data management and improves data quality Improves ability to respond to regulatory requests Enables consistent performance measurement 	<ul style="list-style-type: none"> Consolidates core AM / WM platforms Standardizes core AM/ WM capabilities, processes, and practices Establishes WM / AM platform to support electric business enablement and future enhancements
4 Value Oriented – Jurisdiction Deployment	<ul style="list-style-type: none"> Improves application availability Comprehensively addresses operational challenges; gas safety and compliance Improved work management systems & capabilities support capital delivery 	<ul style="list-style-type: none"> Significant impact on efficiency and productivity Enhances the customer experience Simplifies data management and improves data quality Improves ability to respond to regulatory requests Enables consistent performance measurement 	<ul style="list-style-type: none"> Consolidates major gas business platforms Standardizes capabilities, processes, and practices Establishes platforms to support electric business enablement and future enhancements
5 Value Oriented – Accelerated Deployment	<ul style="list-style-type: none"> Improves application availability Comprehensively addresses operational challenges; gas safety and compliance Improved work management systems & capabilities support capital delivery 	<ul style="list-style-type: none"> Significant impact on efficiency and productivity Enhances the customer experience Simplifies data management and improves data quality Improves ability to respond to regulatory requests Enables consistent performance measurement 	<ul style="list-style-type: none"> Consolidates major gas business platforms Standardizes capabilities, processes, and practices Establishes platforms to support electric business enablement and future enhancements

Legend Fully Meets Partially Meets Doesn't Meets

CONFIDENTIAL

Of the three options evaluated, the jurisdiction and accelerated value oriented options deliver financial benefits by implementing enhanced capabilities which offset the investment.



<u>Option</u>	<u>Investment</u>	<u>Financial Benefits</u>	<u>Payback</u>
3 Backbone	\$273M	None	N/A ¹
4 Value Oriented – Jurisdiction Deployment	\$458M ○ <i>Enhanced Capabilities: \$185M</i>	\$39.6M	4Y 2M ²
5 Value Oriented – Accelerated Deployment	\$466M ○ <i>Enhanced Capabilities: \$193M</i>	\$39.6M	4Y 4M ²

¹ No payback analysis completed as capabilities that drive value (e.g., enhanced capabilities) are not being implemented in these three options

² Payback based on the implementation of enhanced capabilities that drive value; the start of payback assumed to be year 5 which is the full deployment of the enhanced capabilities

CONFIDENTIAL

In addition, the backbone and jurisdiction deployment value oriented options allow for delivery approaches that reduce overall delivery risk and minimize impact to the business.



<u>Option</u>	<u>Delivery Approach</u>					<u>Reduces Delivery Risk / Minimizes Business Disruption</u>
	<i>Method</i>	<i>Use of Pilots (Y/N)</i>	<i>Scope of Deployment ¹</i>	<i>Run New System In Parallel w/Old (Y/N)</i>	<i>Resource Ramp ²</i>	
3 Backbone	Agile	Yes	Work Type / Application	Yes	Moderate	↑
4 Value Oriented – Jurisdiction Deployment	Agile	Yes	Work Type / Application	Yes	Moderate	↑
5 Value Oriented – Accelerated Deployment	Agile	Yes	Work Type / Application	Yes	Aggressive	→

Legend ↑ Yes → Partially ↓ No

¹ More granular scope of deployment allows for small scale minimum viable product and hence less risk; work type by application is the least scope that could feasibly be deployed

² The backbone option requires less resources overall compared to the value oriented options; the jurisdiction deployment option elongates some of the early deployments to allow for testing of the capability in a single

The jurisdiction deployment value oriented option is recommended; it meets all three objectives, delivers financial benefits, and minimizes delivery risk and potential business disruption.

CONFIDENTIAL



<i>Option</i>	<i>Decision Rationale</i>
<p>3 Backbone ¹</p>	<ul style="list-style-type: none">  Partially addresses technical and operational risk; exposure to gas safety and compliance penalties remains  Provides no financial benefits / some non-financial benefits; no payback on investment  Consolidates disparate business and operational critical platforms  Requires less resources than value oriented options; slower ramp of resources minimizes delivery risk  Partially supports the broader NG strategic ambition
<p>4 Value Oriented – Jurisdiction Deployment</p>	<ul style="list-style-type: none">  Significantly reduces risk profile  Provides potentially significant financial benefits and non-financial benefits; short payback on investment  Consolidates disparate business and operational critical platforms  Optimizes scope, cost, and value; aligns with rate case schedule; slower ramp of resources minimizes delivery risk  Sufficient to deliver on the broader NG strategic ambition
<p>5 Value Oriented – Accelerated Deployment</p>	<ul style="list-style-type: none">  Significantly reduces risk profile  Provides potentially significant financial and non-financial benefits; short payback on investment  Consolidates disparate business and operational critical platforms  Accelerated delivery; requires significant ramp of resources  Sufficient to deliver on the broader NG strategic ambition

Legend  Positive  Negative

¹ Backbone option recommended as a reduced scope, fall back option to the rate case aligned, value oriented option

**Recommended Option Scope,
Benefits, and Costs**

CONFIDENTIAL



CONFIDENTIAL

The jurisdiction deployment option scope includes backbone and enhanced capabilities and systems.



<i>Backbone Scope</i>	<i>Enhanced Capabilities Scope</i>
<p>Enterprise Asset Management</p> <ul style="list-style-type: none"> • Work Management • Scheduling, & Field Mobility • Integrity Management <p>Geospatial Information System</p> <ul style="list-style-type: none"> • Platform Consolidation • Data Remediation • Field Mobility <p>Asset Management</p> <ul style="list-style-type: none"> • PowerPlan Remediation <p>Data Management</p> <ul style="list-style-type: none"> • Data Quality & Cleansing <p>IS Enabling</p> <ul style="list-style-type: none"> • Agile Methodology • Development Operations • Testing Automation 	<p>Strategic Change, Talent, & Operating Model</p> <ul style="list-style-type: none"> • Operating Model & Value Framework • Business Readiness & Sustainment • Program People Strategy <p>Customer Experience & Interaction</p> <ul style="list-style-type: none"> • Customer & Employee Interaction • CxT Portal & Channel Management • CRM Contact Center Front End • Voice of the Customer, Channel Analytics <p>Advanced Asset Management</p> <ul style="list-style-type: none"> • Asset Investment Planning & Management • Advanced Asset Analytics • Graphical Work Design, Complex Design, & Estimating <p>Advanced EAM Platform</p> <ul style="list-style-type: none"> • Capital Projects & Program Management • Work Management Optimization • Work Forecasting & Planning <p>Supply Chain</p> <ul style="list-style-type: none"> • Integrated Supply/ Demand Planning • Inventory Optimization • Warehouse and Network Optimization <p>Field Technical Training</p> <ul style="list-style-type: none"> • Technical Training Refresh • Work Methods and Procedures

CONFIDENTIAL

The jurisdiction option materially reduces risk through implementation of the backbone systems and capabilities.



<i>Backbone Capabilities and Systems</i>	<i>Risk</i>	<i>How Backbone Systems & Capabilities Reduce Risk</i>
<p>Enterprise Asset Management</p> <ul style="list-style-type: none"> • Work Management • Scheduling, & Field Mobility • Integrity Management <p>Geospatial Information System</p> <ul style="list-style-type: none"> • Platform Consolidation • Data Remediation • Field Mobility <p>Asset Management</p> <ul style="list-style-type: none"> • PowerPlan Remediation <p>Data Management</p> <ul style="list-style-type: none"> • Data Quality & Cleansing <p>IS Enabling</p> <ul style="list-style-type: none"> • Agile Methodology • Development Operations • Testing Automation 	<p>Gas Safety & Compliance Risk</p>	<ul style="list-style-type: none"> • Standardized & simplified operational process reduce complexity and ambiguity • Improved visibility to planned compliance work and status reduces risk of missing critical dates or deadlines • Improved asset information, records, and transaction data accuracy reduces potential errors and/or incidents in the field • Advanced mobility tools allow real-time access to critical information in the field • Modernized core EAM platforms enables more effective work planning, forecasting, and execution of the capital delivery program • Integration with Supply Chain platform reduces fulfillment and logistics challenges & project delays enabling improved capital delivery execution
	<p>Technology Risk</p>	<ul style="list-style-type: none"> • Modernized core EAM platforms improves application availability minimizing business disruption
	<p>Program Delivery Risk</p>	<ul style="list-style-type: none"> • Agile methodology including development operations and automated testing allows small scale, minimum viable product to be deployed, piloted, and refined • Utilizing Agile enables faster risk reduction by addressing most pressing issues in a shorter timeframe

CONFIDENTIAL



In addition to reducing risk, the program also improves business performance and delivers material financial benefits through the implementation of six key enhanced capabilities.

Enhanced Capabilities	Value Drivers	Annual Benefit (\$M)
Strategic Change, Talent, & Operating Model	<ul style="list-style-type: none"> • Process efficiency • Improved performance management • Performance oriented culture 	N/A ¹
Customer Experience & Interactions	<ul style="list-style-type: none"> • Increased use of self-service • New service growth • Increased customer satisfaction 	\$4.5
Advanced Asset Management	<ul style="list-style-type: none"> • Reduced material spend • Reduced O&M spend reduction • Capex effectiveness 	\$4.1
Advanced EAM Platform	<ul style="list-style-type: none"> • Appointments met / kept; reduced penalties • Improved field productivity & utilization • Back office efficiency • Improved operational data / less wasted time analyzing 	\$14.9
Supply Chain	<ul style="list-style-type: none"> • Reduced capex project delays • Reduced material spend • Reduced inventory carrying costs 	\$2.5
Field Technical Training	<ul style="list-style-type: none"> • Reduced gas safety & compliance violations 	\$13.5

Total Annual Benefits (\$M)
\$39.6

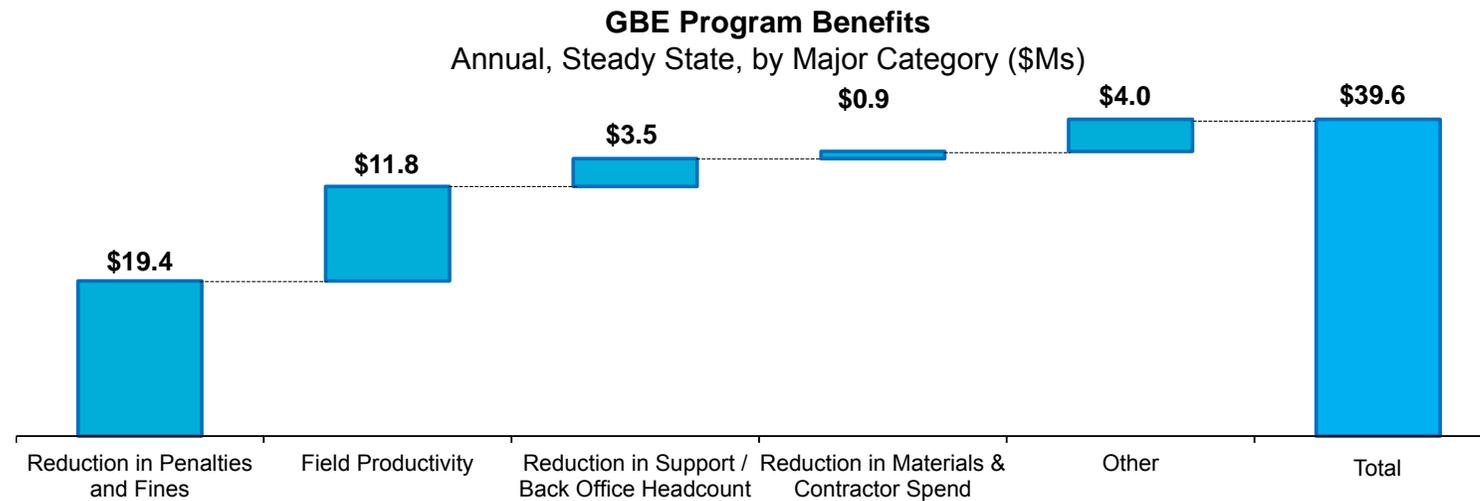
¹ Capabilities increase likelihood of program success and probability of delivering program benefits.

² The threshold benefits are included in the business case and will be part of our rate case submissions. There is a high degree of confidence these will be delivered

CONFIDENTIAL



These financial benefits can be categorized into four main categories.

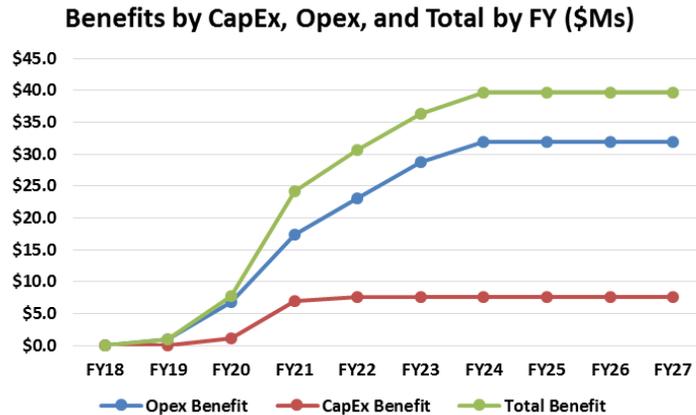


Key Points

- Approximately 50% of the benefits come from reduced penalties and fines; almost all fines are associated with three categories - gas safety, compliance, and service quality
- Field productivity benefits span both M&C and CMS and come from reducing travel time, CGIs, and non-productive time (e.g., available time in CMS), as well as reducing or eliminating repeat visits (e.g., meter verifications)
- Back office and support benefits come from reducing clerical and mapping / records support through improved field mobility capabilities (e.g., electronic time sheets, electronic red-line updates, etc.)

CONFIDENTIAL

Benefits start to be realized in FY19 and achieve an annual steady state run rate of \$39.6M by FY24.



Key Points

- Benefits assumed to be realized after the deployment of the enhanced capabilities
- The first enhanced capabilities to be deployed are Advanced Asset Management Engineering and Technical Training capabilities which start to drive value in FY19
- Start of benefits assumes a lag period after the deployment of the enhanced capabilities to allow for a stabilization period; the typical lag period is between three (3) and nine (9) months depending on the type of benefits
- Benefits ramp from the start of realization to a full annual run rate over a number of months; the typical ramp period is between three (3) and eighteen (18) months depending on the type of benefits; NOTE: benefits that require culture / performance changes typically take longer to ramp to than benefits that require simple technology or process changes

24

CONFIDENTIAL

In addition to financial benefits, significant non-financial benefits are achieved through the implementation of enhanced capabilities.



Operational Benefits

Operations will see a number of benefits:

- **Employee Engagement and Retention:** Robust systems and tools, standardized processes, and simplified work methods make it easier for employees to do their jobs leading to improved engagement, morale, and retention
- **Asset Risk Reduction:** Robust asset investment planning capabilities, tools, and analytics allow for more effective asset replacement and maintenance prioritization thus reducing asset risk for each dollar spent
- **Simplified Planning:** Visibility to all work in one core platform coupled with seamless, electronic integration of work demand with other key platforms (e.g., HR, supply chain) reduces planning complexity
- **Regulatory Relationship:** Simplified regulatory reporting and improved safety and compliance performance will enhance our regulatory relationships
- **Safety:** Advanced and consistent technical training improves employees' technical skills and simplified work methods reduce ambiguity in the field leading to increased safety performance
- **Optionality:** Common platforms, processes, practices and an efficient and effective operating model provides an opportunity to capture inorganic growth opportunities (e.g., M&A)

Customer Benefits

Customers will see a number of benefits:

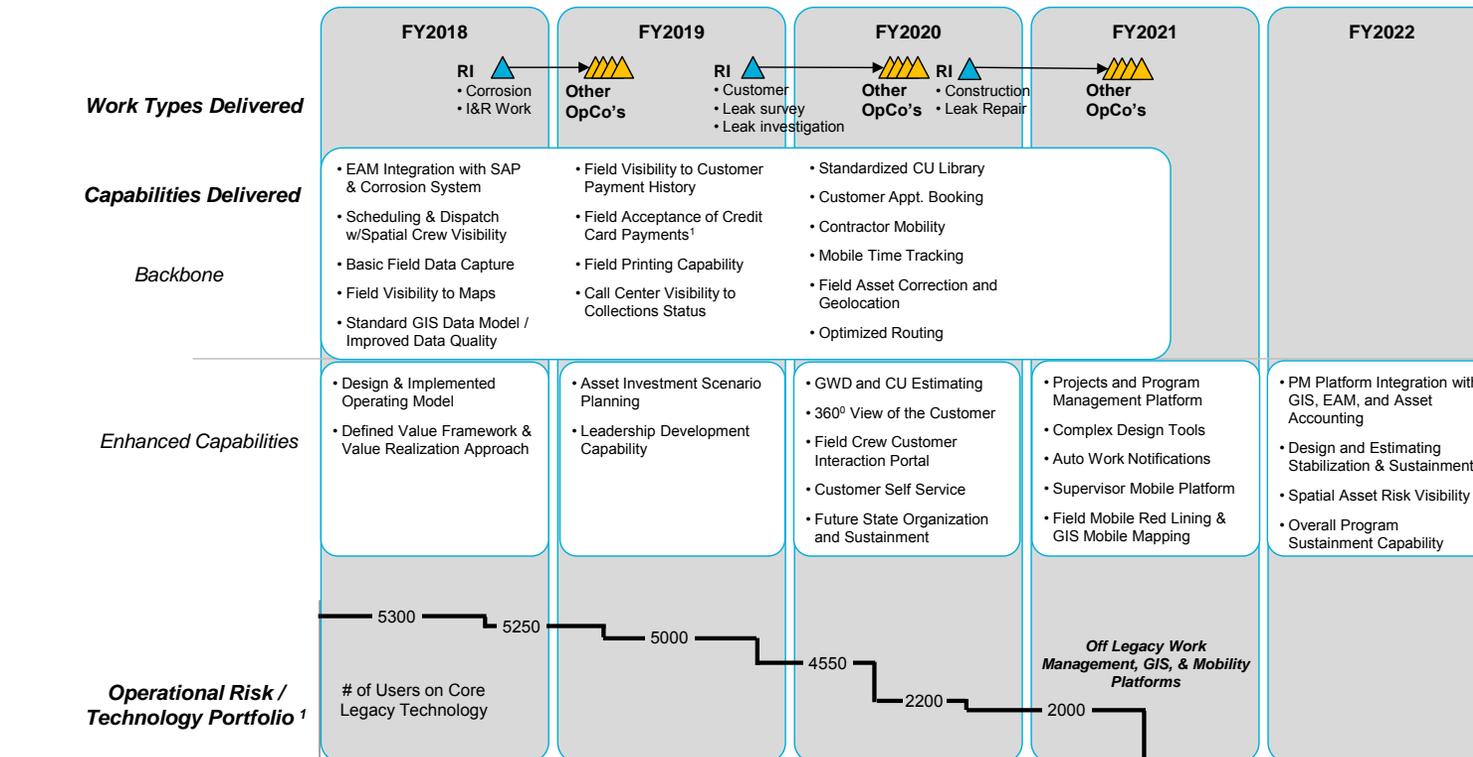
- **Ability to Convert to Gas:** Increased ability to meet the demand for new gas connections and conversion requests reducing customer energy costs by approximately \$1,500 per year ¹
- **Customer Engagement Benefits:** Robust self-service platform will allow our customers to interact with us via the internet and avoid having to call the contact center and spend an average 5 minutes interacting per call; consolidated customer information to allow us to respond quickly and accurately to customer inquires
- **Rate Benefits:** Reduction in O&M and increase in new gas customers results in downward pressure on rates
- **Reliability:** Delivery of our main replacement program (\$2Bln in FY18) enables us to reduce the number of leaks and potential outages our customers may face
- **Safety:** Reduction in leaks reduces the probability of a significant event occurrence improving public safety
- **Environmental:** Significant reduction in CO₂ emissions (44 pounds per BTU) by enabling customers to switch from oil heat to natural gas heat ²

¹ Mass DOER 2016/2017 Heating Season Costs

² Oil – 161.3 pounds per BTU, Natural Gas – 117 pounds per BTU; Source: https://www.eia.gov/environment/emissions/co2_vol_mass.cfm

Backbone capabilities are delivered over three and a half years, prioritized to reduce operational risk and reduce the # of uses on legacy technology, with enhanced capabilities delivered in five years.

CONFIDENTIAL

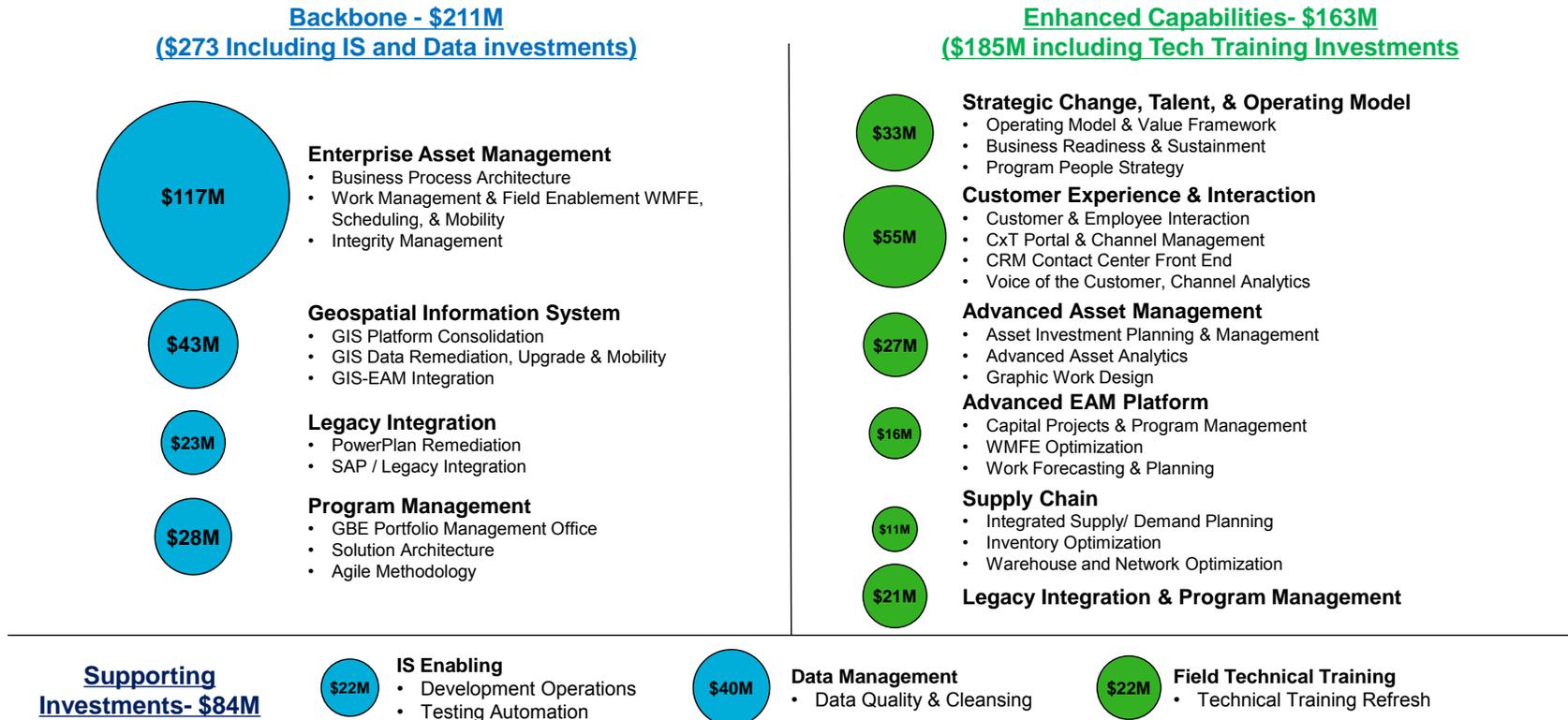


¹ Legacy backbone applications estimated to go from 42 out of 117 total applications currently to 6 out of 22 post implementation

CONFIDENTIAL



The \$458M¹ investment includes \$211M for backbone capabilities, \$163M for enhanced capabilities, and \$84M for supporting investments.

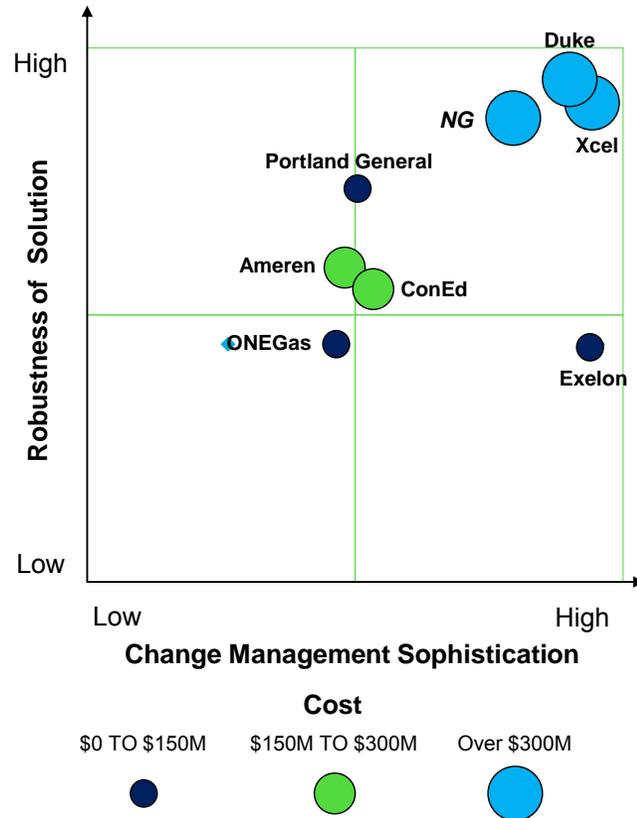


¹ Investment does not include contingency of \$61M

○ Size indicates relative cost of initiatives / initiative groupings

CONFIDENTIAL

The investment relative to the robustness of the proposed solution and change management sophistication is in line with other large programs.



Key Points

- Core Work and Asset Management with Mobility is a common denominator of the programs
- Duke Energy continues to integrate the acquisitions and has implemented all lines of business including Supply Chain, Generation, Gas and Electric onto a single instance/platform
- Xcel Energy has implemented the first major release for electric in Energy Supply; T&D Operations to follow in Summer 2017
- Portland General Electric is a consolidated platform built on standard processes
- Exelon is focused on merger integration and is more of a technical upgrade with less emphasis on standardization of processes
- ONE Gas standardized processes and platforms and change management was a minimalistic approach

CONFIDENTIAL



The \$458M investment excludes estimated contingency of \$61M over the life of the program. ¹

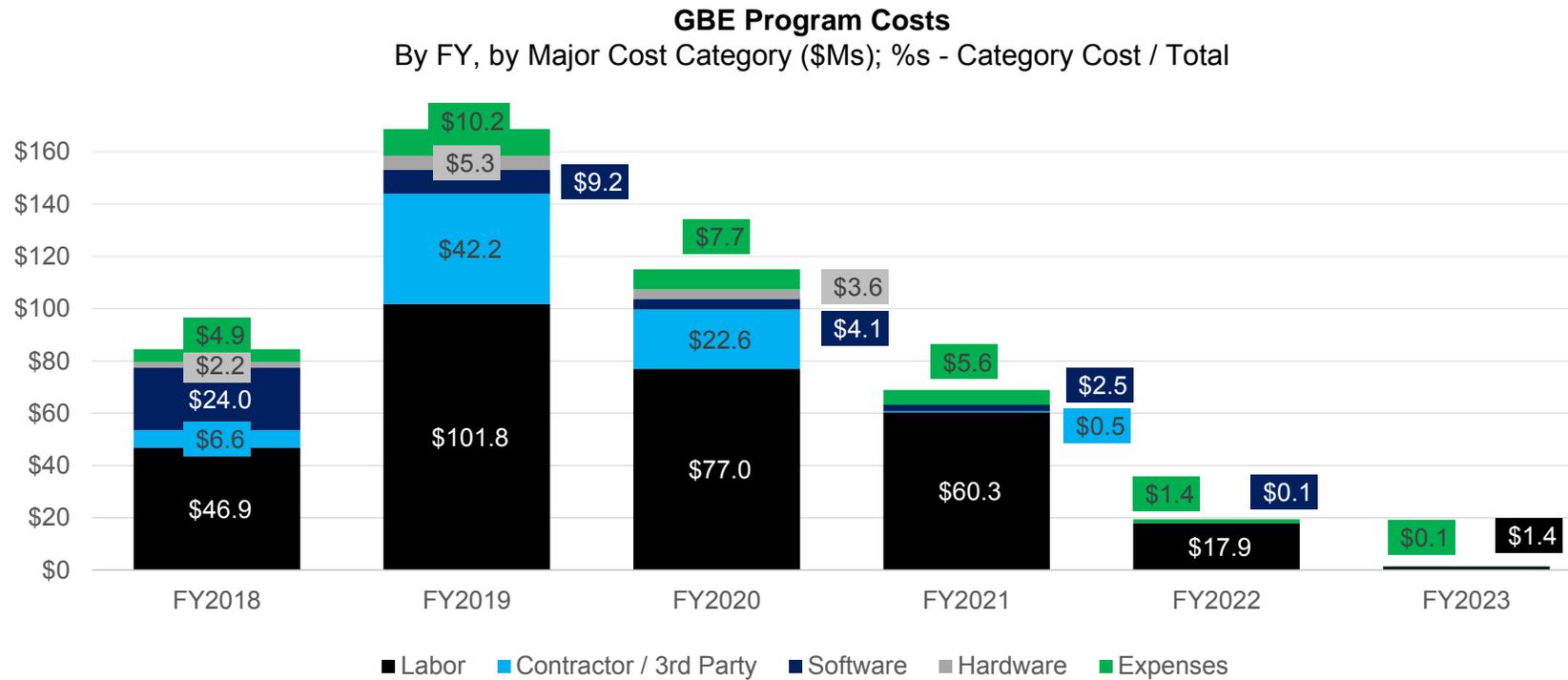
Category & Initiative	FY18	FY19	FY20	FY21	FY22	FY23	Total
Backbone	(\$45,365)	(\$80,946)	(\$58,311)	(\$23,868)	(\$2,698)	\$0	(\$211,187)
Core EAM Platform	(\$23,006)	(\$46,599)	(\$32,882)	(\$13,576)	(\$1,135)	\$0	(\$117,199)
GIS	(\$6,569)	(\$18,689)	(\$14,105)	(\$3,528)	\$0	\$0	(\$42,890)
Legacy Integration	(\$10,055)	(\$6,991)	(\$3,579)	(\$2,161)	(\$548)	\$0	(\$23,334)
Program Management	(\$5,736)	(\$8,666)	(\$7,745)	(\$4,603)	(\$1,015)	\$0	(\$27,765)
Enhanced Capabilities	(\$16,094)	(\$63,968)	(\$37,989)	(\$33,177)	(\$10,924)	(\$669)	(\$162,821)
Advanced Asset Management	(\$2,544)	(\$4,187)	(\$6,936)	(\$12,660)	(\$943)	\$0	(\$27,270)
Advanced EAM Platform	(\$150)	(\$361)	(\$766)	(\$8,796)	(\$6,066)	\$0	(\$16,139)
Customer Experience & Interactions	(\$1,387)	(\$30,038)	(\$18,027)	(\$4,839)	(\$566)	\$0	(\$54,857)
Strategic Change, Talent, & Operating Model	(\$7,689)	(\$13,349)	(\$4,970)	(\$3,295)	(\$2,589)	(\$669)	(\$32,561)
Supply Chain	\$0	(\$9,104)	(\$1,748)	\$0	\$0	\$0	(\$10,852)
Legacy Integration	(\$1,300)	(\$2,613)	(\$1,504)	(\$765)	(\$137)	\$0	(\$6,319)
Program Management	(\$3,024)	(\$4,317)	(\$4,038)	(\$2,821)	(\$622)	\$0	(\$14,822)
Supporting Investments	(\$23,017)	(\$23,827)	(\$18,731)	(\$11,885)	(\$5,798)	(\$875)	(\$84,133)
Data Management	(\$14,481)	(\$8,122)	(\$7,152)	(\$6,870)	(\$3,658)	\$0	(\$40,283)
Regulatory/ Compliance	(\$3,900)	(\$10,500)	(\$7,100)	(\$500)	\$0	\$0	(\$22,000)
IS Enabling	(\$4,636)	(\$5,205)	(\$4,480)	(\$4,515)	(\$2,140)	(\$875)	(\$21,850)
Total Before Contingency	(\$84,476)	(\$168,741)	(\$115,032)	(\$68,930)	(\$19,419)	(\$1,544)	(\$458,141)
Contingency	(\$9,383)	(\$20,356)	(\$15,407)	(\$12,068)	(\$3,588)	(\$279)	(\$61,082)
Total	(\$93,859)	(\$189,097)	(\$130,438)	(\$80,998)	(\$23,007)	(\$1,823)	(\$519,223)

¹ Contingency equals 20% applied to program labor cost only

CONFIDENTIAL



Labor and 3rd party contractor costs make up 82% of the total program cost.



NOTE: Labor cost is inclusive of the cost internal National Grid labor and external consulting / system integrator labor needed to deliver the program; an exercise is ongoing to determine how much of the internal National Grid labor has been included in the rate base and how much is incremental.

CONFIDENTIAL

Ongoing run the business costs to support, maintain, and update the new platforms is \$22.3M.



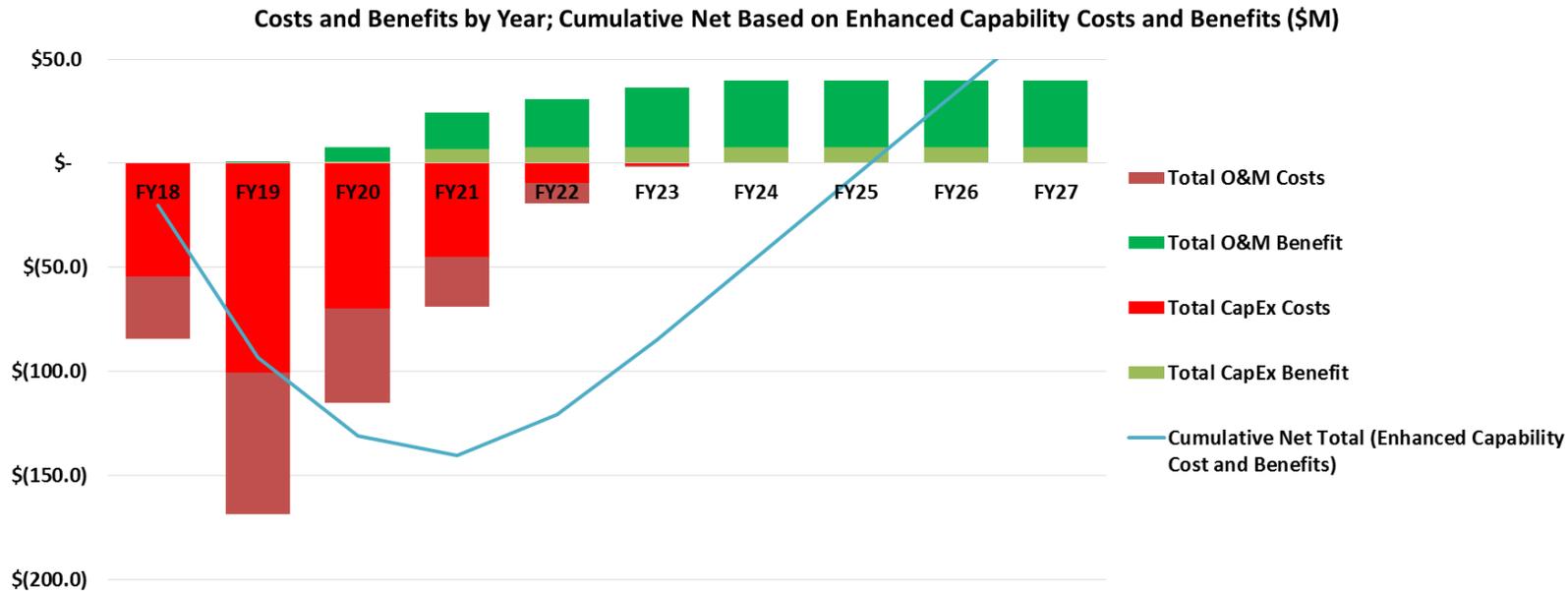
Support Cost Category	FY18	FY19	FY20	FY21	FY22	FY23
Software License Maintenance/Subscriptions	\$ 1,085,149	\$ 3,396,499	\$ 7,933,079	\$ 10,851,487	\$ 10,851,487	\$ 10,851,487
Hardware License Maintenance / Mobile Subscriptions	\$ 516,033	\$ 1,615,176	\$ 3,772,506	\$ 5,160,330	\$ 5,160,330	\$ 5,160,330
Internal & External Labor	\$ -	\$ 2,817,960	\$ 5,635,920	\$ 5,635,920	\$ 5,635,920	\$ 5,635,920
Gas Business Enablement Support Cost	\$ 1,601,182	\$ 7,829,635	\$ 17,341,505	\$ 21,647,737	\$ 21,647,737	\$ 21,647,737
Reduction in Ongoing Legacy Application Support (Net of Any Increase)	\$ -	\$ 192,717	\$ 658,866	\$ 1,621,222	\$ 2,272,003	\$ 2,272,003
Incremental Gas Business Enablement Support Cost	\$ 1,895,961	\$ 8,559,572	\$ 18,837,649	\$ 22,974,305	\$ 22,323,525	\$ 22,323,525

Key Points

- Support costs ramp from FY18 to a steady state run rate of \$24.6M in FY21
- As a result of replacing a significant portion of the legacy application portfolio, existing ongoing legacy support would decrease by \$2.3M annually per year by FY22 offsetting the increase in new support costs
- Software License Maintenance / Subscriptions consists of Software as a Service (SaaS) support for the EAM, scheduling, mobility, IS development operations, visualization, and big data platforms
- Traditional license maintenance support model is utilized for the GIS, PowerPlan, and Copperleaf platforms as well as all other software packages implemented as part of the program
- Hardware License Maintenance / Mobile Subscriptions consist of traditional hardware license maintenance for those platforms not supported via a SaaS model (e.g., servers, mobile devices, etc.)
- Internal and external represent the National Grid IS and application maintenance provides required to support those platforms not supported via a SaaS model

CONFIDENTIAL

Aligning the investment in enhanced capabilities against the benefits yields a break even in early FY26.



Key Points

- Full deployment of the advanced capabilities is assumed to occur in FY21; some capabilities will be deployed in FY22 but the major capabilities will have been deployed by end of FY21
- Break even point occurs within the first two months of FY26, representing a 4Y 2M payback period; key assumption - year 1 is FY22

CONFIDENTIAL

The investment yields a 10 year NPV of ~\$100M assuming the life of the solutions implemented is 15 years driving recurring investment to sustain benefits.



Free Cash Flow																		
(\$000)																		
	Type	FY18	FY19	FY20	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30	FY31	FY32		
Opex Benefits																		
	Capacity Savings	-	-	1,242	6,990	7,814	8,486	8,722	8,722	8,722	8,722	8,722	8,722	8,722	8,722	8,722		
	Compliance	-	876	5,070	9,577	13,254	16,739	19,406	19,406	19,406	19,406	19,406	19,406	19,406	19,406	19,406		
	Spend Reduction	-	79	425	754	2,010	3,527	3,841	3,841	3,841	3,841	3,841	3,841	3,841	3,841	3,841		
Total Opex Benefits		-	955	6,737	17,321	23,077	28,752	31,969	31,969	31,969	31,969	31,969	31,969	31,969	31,969	31,969		
Opex Expenses																		
	Labor	Investment	(9,571)	(22,379)	(10,181)	(7,052)	(3,676)	(534)	-	-	-	-	-	-	-	-		
	Contractor / 3rd Party	Investment	(3,150)	(10,152)	(6,823)	(500)	-	-	-	-	-	-	-	-	-	-		
	Program Expenses	Investment	(1,101)	(2,389)	(833)	(465)	(262)	(21)	-	-	-	-	-	-	-	-		
	SW / HW Support	Maintenance	-	(577)	(2,866)	(6,229)	(7,393)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)		
Total Opex Expenses			(13,823)	(35,497)	(20,704)	(14,245)	(11,332)	(7,685)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)	(7,131)		
EBITDA			(13,823)	(34,542)	(13,966)	3,076	11,746	21,067	24,838									
Depreciation (Book, Net)			(179)	(1,324)	(2,084)	(2,629)	(2,611)	(2,393)	(2,171)	(1,949)	(1,728)	(1,506)	(1,284)	(1,063)	(841)	(619)		
EBIT			(14,002)	(35,866)	(16,051)	447	9,135	18,674	22,667	22,889	23,111	23,332	23,554	23,776	23,998	24,219		
Income Taxes			5,601	14,346	6,420	(179)	(3,654)	(7,470)	(9,067)	(9,156)	(9,244)	(9,333)	(9,422)	(9,510)	(9,599)	(9,688)		
Net Income			(8,401)	(21,520)	(9,630)	268	5,481	11,205	13,600	13,733	13,866	13,999	14,132	14,265	14,399	14,532		
Depreciation (Book, Net)			179	1,324	2,084	2,629	2,611	2,393	2,171	1,949	1,728	1,506	1,284	1,063	841	619		
Net Capex			(6,171)	(39,484)	(26,217)	(18,783)	612	7,527	7,646	7,646	7,646	7,646	7,646	7,646	7,646	7,646		
Deferred Income Taxes			281	2,335	5,001	5,963	5,616	4,033	2,915	2,293	1,335	94	(899)	(1,529)	(1,704)	(1,753)		
Free Cash Flow			\$ (14,112)	\$ (57,345)	\$ (28,762)	\$ (9,923)	\$ 14,320	\$ 25,157	\$ 26,333	\$ 25,622	\$ 24,575	\$ 23,246	\$ 22,164	\$ 21,445	\$ 21,182	\$ 21,044		
NPV																		
3-year			\$16,004															
5-year			\$41,427															
10-year			\$99,389															
Terminal Value Calculation																		
Average 15 Year Cash Flows*																	\$ 9,057	
Cost/Benefit Growth Rate**																		2.00%
Rate of Return																		9.98%
Terminal Value																		\$ 113,495

* Terminal value average cash flows assumes the solution will need to be replaced every 15 years to maintain the benefit stream; terminal value annual cash flow is the average annual free cash flow over the 15 year period from FY18 to FY32.
** Growth rate is equivalent to the rate of inflation

Appendix

CONFIDENTIAL



Strategy | Consulting | Digital | Technology | Operations

CONFIDENTIAL



Key business case assumptions and inputs.

Rates

External

Application Maintenance Provider Onshore	\$3,800
Application Maintenance Provider Offshore	\$1,600
Business/Management Consultant Onshore	\$2,315
Business/Management Consultant Offshore	\$1,240
System Integrator Onshore	\$1,680
System Integrator Offshore	\$390

NOTE: External rates have an annual 3% escalation

Internal

Client Executive Onshore	\$1,430
Client Business – Non-Executive Onshore	\$908
Client IS – Non-Executive Onshore	\$880

NOTE: Internal rates have an annual 2% escalation

Expenses

17% on External / Onshore Labor
10% on National Grid Labor

NOTE: Client rates inclusive of 10% expenses; external rates exclude expenses

Contingency

20% contingency added to labor

General Operating Company Allocator

New York	30.10%
New York	21.55%
New York	12.44%
Massachusetts	23.29%
Massachusetts	5.21%
Rhode Island	7.41%

NOTE: General allocator used for costs and some benefits

Days / Horus

Days Per Month	20
Hours Per Day	8
Hours Per Month	160

Benefits

Lag Period

Lag period defined as the time between deployment of a capability (e.g., system, process, etc.) and the time benefits start to be achieved. Benefit lag period can be 3, 6, or 9 months depending on the type of benefits.

Ramp

Ramp defined as the time benefits start to be achieved to the time benefits are at full steady state run rate. Ramps can be 0 months (e.g., benefits realized immediately) to 36 months and like lag period, depends on the type of benefits.

Options, investment, financial benefits, and payback



<i>Option</i>	<i>Investment</i>	<i>Financial Benefits</i>	<i>Payback</i>
1 Tech Stabilization	\$15M to \$20M	None	N/A ¹
2 Like for Like Replacement	\$174M	None	N/A ¹
3 Backbone Only	\$273M	None	N/A ¹
4 Value Oriented – Jurisdiction Deployment	\$458M ○ <i>Enhanced Capabilities: \$185M</i>	\$39.6M	4Y 4M ²
5 Value Oriented – Accelerated Deployment	\$466M ○ <i>Enhanced Capabilities: \$193M</i>	\$39.6M	4Y 2M ²

¹ No payback analysis completed as capabilities that drive value (e.g., enhanced capabilities) are not being implemented in these three options

² Payback based on the implementation of enhanced capabilities that drive value; the start of payback assumed to be Year 5 which is the full deployment of the enhanced capabilities; payback calculation = enhanced capability cost / enhanced capability benefits

Work streams and initiatives



Work Streams	Initiatives					
GBE Portfolio Office						
Business Enablement	Program Level People Strategy	Operating Model & Value Framework	Program Business Readiness & Sustainment	Leadership Capability		
Work Management	Process Architecture	Work Management and Field Enablement	Work Management Analytics	Projects & Program Management		
Asset Management	Engineering, Design, Estimating & Mobility	Asset Investment Planning and Management	Integrity Management	Asset - Advanced Analytics		
Regulatory/ Compliance	Standards Operating Procedure Documentation	Document Management	Technical Training			
Customer Engagement	Customer Interaction	Customer Employee Journey	CRM / Contact Center	Channel Analytics		
Data Management	Data Management	Data Quality & Cleansing	Remediation & Integration			
Supply Chain	SC Process Architecture	Integrated Supply & Demand Planning	Capability Building	SC Master Data Improvements	Inventory Optimization	Warehouse & Network Optimization
Information Systems Enabling						

Cost by initiative category and backbone, enhanced capabilities, and supporting investments



Initiative Category	Backbone \$Ms	Enhanced Capabilities \$Ms	Supporting Investments \$Ms	Total Cost \$Ms ^{1, 2}	% of Total Investment
Advanced Asset Management		\$27		\$27	6%
Advanced EAM Platform		\$16		\$16	4%
Core EAM Platform	\$117			\$117	26%
Customer Experience & Interactions		\$55		\$55	12%
Data Management			\$40	\$40	9%
Field Technical Training	\$43			\$43	9%
GIS			\$22	\$22	5%
IS Enabling	\$23	\$6		\$30	6%
Legacy Integration	\$28	\$15		\$43	9%
Program Management			\$22	\$22	5%
Strategic Change, Talent, & Operating Model		\$33		\$33	7%
Supply Chain		\$11		\$11	2%
Total before Contingency	\$211	\$163	\$84	\$458	100%
% of Total	46%	36%	18%		
Contingency				\$61	
Total				\$519	

¹ Costs include expenses (17% external, onshore labor cost; 10% internal labor costs); cost includes HW/SW)

² Average Daily Rates: NG - \$845; External - \$1,001 (External Onshore - \$1,711; External Offshore - \$326)

³ Contingency equals 20% applied to labor cost only; not applied to support (RTB) costs



Cost by operating company, capex / opex (\$000s)

CapEx Cost Incurred	FY18	FY19	FY20	FY21	FY22	FY23	Total ^{1,2}
Brooklyn Union Gas (KEDNY)	(\$16,341)	(\$30,265)	(\$21,051)	(\$13,567)	(\$2,896)	(\$222)	\$ (84,342)
Keyspan Gas East (KEDLI)	(\$11,699)	(\$21,668)	(\$15,071)	(\$9,713)	(\$2,073)	(\$159)	\$ (60,384)
NiagraMohawk Gas	(\$6,753)	(\$12,508)	(\$8,700)	(\$5,607)	(\$1,197)	(\$92)	\$ (34,857)
Boston Gas	(\$12,644)	(\$23,418)	(\$16,288)	(\$10,498)	(\$2,240)	(\$172)	\$ (65,260)
Colonial Gas	(\$2,828)	(\$5,239)	(\$3,644)	(\$2,348)	(\$501)	(\$38)	\$ (14,599)
Narragansett Gas	(\$4,023)	(\$7,451)	(\$5,182)	(\$3,340)	(\$713)	(\$55)	\$ (20,763)
Total:	\$ (54,288)	\$ (100,549)	\$ (69,937)	\$ (45,073)	\$ (9,620)	\$ (738)	\$ (280,205)

Opex Cost Incurred	FY18	FY19	FY20	FY21	FY22	FY23	Total ^{1,2}
Brooklyn Union Gas (KEDNY)	(\$9,086)	(\$20,526)	(\$13,573)	(\$7,181)	(\$2,950)	(\$243)	\$ (53,559)
Keyspan Gas East (KEDLI)	(\$6,505)	(\$14,695)	(\$9,718)	(\$5,141)	(\$2,112)	(\$174)	\$ (38,345)
NiagraMohawk Gas	(\$3,755)	(\$8,483)	(\$5,610)	(\$2,968)	(\$1,219)	(\$100)	\$ (22,135)
Boston Gas	(\$7,031)	(\$15,882)	(\$10,502)	(\$5,556)	(\$2,282)	(\$188)	\$ (41,441)
Colonial Gas	(\$1,573)	(\$3,553)	(\$2,349)	(\$1,243)	(\$511)	(\$42)	\$ (9,270)
Narragansett Gas	(\$2,237)	(\$5,053)	(\$3,341)	(\$1,768)	(\$726)	(\$60)	\$ (13,185)
Total:	\$ (30,188)	\$ (68,192)	\$ (45,094)	\$ (23,857)	\$ (9,800)	\$ (806)	\$ (177,936)

Total Cost Incurred	FY18	FY19	FY20	FY21	FY22	FY23	Total ^{1,2}
Brooklyn Union Gas (KEDNY)	(\$25,427)	(\$50,791)	(\$34,624)	(\$20,748)	(\$5,845)	(\$465)	\$ (137,901)
Keyspan Gas East (KEDLI)	(\$18,204)	(\$36,364)	(\$24,789)	(\$14,854)	(\$4,185)	(\$333)	\$ (98,729)
NiagraMohawk Gas	(\$10,509)	(\$20,991)	(\$14,310)	(\$8,575)	(\$2,416)	(\$192)	\$ (56,993)
Boston Gas	(\$19,674)	(\$39,300)	(\$26,791)	(\$16,054)	(\$4,523)	(\$360)	\$ (106,701)
Colonial Gas	(\$4,401)	(\$8,791)	(\$5,993)	(\$3,591)	(\$1,012)	(\$80)	\$ (23,869)
Narragansett Gas	(\$6,260)	(\$12,504)	(\$8,524)	(\$5,108)	(\$1,439)	(\$114)	\$ (33,948)
Total:	\$ (84,476)	\$ (168,741)	\$ (115,032)	\$ (68,930)	\$ (19,419)	\$ (1,544)	\$ (458,141)

¹ Costs include expenses (17% external, onshore labor cost; 10% internal labor costs); cost includes HW/SW)

² Average Daily Rates: NG - \$845; External - \$1,001 (External Onshore - \$1,711; External Offshore - \$326)

CONFIDENTIAL



Capex / opex benefit splits

Job Category	CapEx	O&M	Notes
Analysts	15%	85%	Assume some work performed as part of capital program
CMS Clerk (Electric and Gas)	10%	90%	FY18 CMS workplan; assume same split as field worker
CMS Field Worker - Other CMS (Electric and Gas)	10%	90%	FY18 CMS workplan
CMS Field Worker - Collections (Electric and Gas)	0%	100%	FY18 CMS workplan
CMS Field Worker - Meter Verifications (Electric and Gas)	0%	100%	FY18 CMS workplan
CMS Field Supervisor (Electric and Gas)	5%	95%	Assume less capex than field worker as some administrative work charged as O&M
Dispatcher	10%	90%	FY18 CMS workplan split
Dispatch Supervisor	5%	95%	Assumed less capex than dispatcher as some administrative work charges as O&M
Engineer – AM	30%	70%	NG Finance
Engineer / Designer – Systems Engineering	70%	30%	NG Finance
Mapper	70%	30%	NG Finance
Field Ops Field Worker (M&C)	45%	55%	Based on FY17 OT report with base and OT hours and \$ (Feb through April)
Field Ops Field Worker (I&R)	13%	87%	Based on FY17 OT report with base and OT hours and \$ (Feb through April)
Field Ops Field Worker (Corrosion)	13%	87%	Based on FY17 OT report with base and OT hours and \$ (Feb through April)
Field Ops Field Worker (Damage Prevention)	19%	81%	Based on FY17 OT report with base and OT hours and \$ (Feb through April)
Field Ops Supervisor (PM&CC)	71%	29%	Based on FY17 OT report with base and OT hours and \$ (Feb through April)
Field Ops Supervisor (All)	32%	68%	Based on FY17 OT report with base and OT hours and \$ (Feb through April) – average of all work
Field Ops Support (Coordinator)	32%	68%	Assume same as supervisor – average of all work
Field Ops Support (Clerk)	32%	68%	Assume same as supervisor – average of all work
QA/QC Inspector	0%	100%	Based on type of work
Project Manager	71%	29%	Based on type of work – PM&CC
Call Center Rep	0%	100%	Based on type of work
Material Handler / Stock Clerk	0%	100%	Based on type of work
Materials	87%	13%	Based on category
Inventory Carrying Cost	0%	100%	Based on category
Inventory Write Offs	0%	100%	Based on category
Fleet Operating Cost	0%	100%	Based on category; includes mileage, minor maintenance and parts
Alliance Contractor Spend (Capital Projects)	90%	10%	Based on category

CONFIDENTIAL



Capex / opex cost splits by initiative (1 of 2)

Initiatives	Releases	CapEx	Opex	
Gas Business Enablement Portfolio Management Office AIPM	Portfolio Management Leadership	0%	100%	
	Asset Analytics Integration	100%	0%	
	EAM-FIN Integration	100%	0%	
	Enhancements	95%	5%	
	GIS (GWD/CU) - PPM Integration	100%	0%	
AM Program Leadership	AM Program Leadership	0%	100%	
Asset - Advanced Analytics	Use Case No.1 - Asset Risk	95%	5%	
Business Architecture Design	Business Architecture Design	80%	20%	
Customer Experience Program Leadership	Customer Experience Program Leadership	0%	100%	
Customer Interaction	Customer Interaction	95%	5%	
	CxT Portal & Channel Management	95%	5%	
	Large Commercial & Landlord Interaction	95%	5%	
Data Management	Building An Advanced Analytics Capability	0%	100%	
	Building Score Cards & Metrics Capability	0%	100%	
	Data Enrichment Through Record Digitization	0%	100%	
	Data Management Implementation (Quality & Cleansing)	0%	100%	
	Enable the Data Archive Process	90%	10%	
	Pre GBE Deployment & Data Profiling	0%	100%	
	Data Governance Assessment & Implementation	0%	100%	
	Data Management & Governance Program Leadership	0%	100%	
	Enabling Capabilities	Comprehensive Integration Services (Enhancements)	100%	0%
		Development Operations & BPA Enablement	80%	20%
IS Operating Model (Delivery / Support, Run)		0%	100%	
Security Enhancements (CASB, MDM)		100%	0%	
Testing Center of Excellence		80%	20%	
Engineering, Design, Estimating & Mobility	Complex Design (CAD) & Estimating (ESW)	90%	10%	
	GIS Upgrade/ Migration & GIS Mobility	95%	5%	
	GIS Data Remediation	0%	100%	
	Design & Estimating Process Stabilization	0%	100%	
	Design (GWD), Estimating (CU), & Mobility	90%	10%	
	GIS-EAM Integration	100%	0%	
Integrity Management	Additional IM Modules	90%	10%	
	Integrity Management Integrations	100%	0%	
	Pressure Reg Station (Prelim Work)	0%	100%	
Integrated Supply & Demand Planning	Risk Management (Tx Mains & Dx Mains)	90%	10%	
	Construction Planning	0%	100%	
	Maintenance & Inspection Planning	0%	100%	
	Program and Project Management Planning	0%	100%	
Integrated Supply Feasibility Evaluation and Strategy	Integrated Supply Feasibility Assessment	0%	100%	
	Inventory Optimization	0%	100%	
Inventory Optimization	Inventory Strategy	0%	100%	
	Business Architecture - Organization Design & Transition	0%	100%	
	Operations Performance, Governance & Value Realization	0%	100%	
	Skills/ Capability Assessment & Curriculum Redesign	0%	100%	
	Future State Culture Definition	0%	100%	
	Leadership Capability Development	0%	100%	

Source: NG Finance / Technical Accounting – Enzo Ciccia

CONFIDENTIAL



Capex / opex cost splits by initiative (2 of 2)

Initiatives	Releases	CapEx	Opex
Program Business Readiness & Sustainment	Program Business Readiness	0%	100%
	Program Business Sustainment	0%	100%
	Knowledge Transition & Collaboration Strategy	0%	100%
Program Level People Strategy	Program Learning Management	25%	75%
	Program Transformational Change Office	15%	85%
	Workforce Strategy Planning & Implementation Support	0%	100%
	Labor Contract Strategy & Implementation Support	0%	100%
Projects & Program Management	Core Projects & Program Management	90%	10%
	Powerplan Remediation	90%	10%
Remediation & Integration	SAP and Application Integration Development- Release 1	100%	0%
	SAP and Application Integration Development- Release 2	100%	0%
	SAP and Application Integration Development- Release 3	100%	0%
	Technical Training	14%	86%
Regulatory/ Compliance	SC - Business Architecture Design	0%	100%
Structured Experiences	Customer & Employee Journey Mobilization	0%	100%
Supply Chain Master Data Improvements	Data Cleansing Execution	0%	100%
	Defined Data Cleansing Approach	0%	100%
Supply Chain Program Leadership	Supply Chain Program Leadership	0%	100%
Supporting through Data	Campaign Management	0%	100%
	Channel Analytics	0%	100%
Solution Architects & Agile Coaches	Solution Architects & Agile Coaches	90%	10%
Support Interaction	CRM / Contact Center	95%	5%
	Employee Support Interaction	95%	5%
Technology Initiatives	Application (Environment) Infrastructure	100%	0%
	Mobility CoE & End-User Computing	100%	0%
	Network Enhancements	100%	0%
	Operations/System Monitoring	95%	5%
WMFE Program Leadership	WMFE Program Leadership	0%	100%
Work Management & Field Enablement	Company Driven Work: Collections and non-Appointment Offs	90%	10%
	Construction Work & Leak Repair	90%	10%
	Corrosion and I&R Work	90%	10%
	CU Governance & Library - process	90%	10%
	Customer, Leak Investigation & Inspections	90%	10%
	PowerPlan Integration & Enhancements	90%	10%
	WMFE Optimization	90%	10%
	Work Forecasting & Planning - solution	90%	10%
	Networking Transportation & Optimization Analysis	0%	100%
	Networking Transportation & Optimization Implementation	0%	100%
Warehousing and Network Optimization	Warehousing Optimization	0%	100%

CONFIDENTIAL



Benefit types

Type	Description	Examples
Type 1	<ul style="list-style-type: none"> Have a direct and certain impact on bottom line and there is a clear cause and effect relationship between the project and benefit. Direct P&L impact Is a permanent reduction in costs / assets or increased revenue Stated in dollars (\$) 	<ul style="list-style-type: none"> Reduction in labor Scrap or Material reductions Inventory reduction Incremental sales
Type 2	<ul style="list-style-type: none"> Not a direct and immediate bottom line impact Consists of expenses re-assigned, resources freed up or future cost avoidance Often stated in terms such as “5 person-days freed up”, etc. 	<ul style="list-style-type: none"> Existing resources (capital or human) are re-assigned Future resource (capital or human) requirements are reduced because of process improvements Space requirements are reduced but we are unable to vacate the building
Type 3	<ul style="list-style-type: none"> Difficult to establish a clear cause and effect relationship to the bottom line Typically operational / non-financial savings Typically stated in units specific to the benefit (e.g. SAIFI) 	<ul style="list-style-type: none"> Safety Customer satisfaction and loyalty Employee engagement Mandatory statutory requirements

Annual benefits by category, capex / opex, and type



Area	Threshold Benefit
Customer Experience & Interactions	Total \$4.5
	CapEx: \$0.0
	Opex: \$4.5
	Type 1: \$0.6
	Type 2: \$3.9
Asset Management	Total \$4.1
	CapEx: \$1.0
	Opex: \$3.1
	Type 1: \$2.0
	Type 2: \$2.1
EAM / Work Management Platform	Total \$14.9
	CapEx: \$6.4
	Opex: \$8.5
	Type 1: \$1.8
	Type 2: \$13.1
Supply Chain	Total \$2.5
	CapEx: \$2.2
	Opex: \$0.3
	Type 1: \$0.0
	Type 2: \$2.5
Field Technical Training	Total \$13.5
	CapEx: \$0.0
	Opex: \$13.5
	Type 1: \$0.0
	Type 2: \$13.5
Totals	Total \$39.6
	CapEx: \$9.7
	Opex: \$29.9
	Type 1: \$4.4
	Type 2: \$35.2

CONFIDENTIAL



Cost by Initiative, capex / opex (000's)

Category & Initiative	Total Cost	Total CapEx Cost	CapEx as % of Total	Total O&M Cost	O&M as % of Total
Backbone	(\$211,187)	(\$151,315)	54%	(\$59,872)	34%
Core EAM Platform	(\$117,199)	(\$102,750)	37%	(\$14,448)	8%
Business Architecture Design	(\$3,755)	(\$3,004)	1%	(\$751)	0%
WMFE Program Leadership	(\$5,201)	\$0	0%	(\$5,201)	3%
Work Management & Field Enablement	(\$98,148)	(\$90,340)	32%	(\$7,808)	4%
Data Management	(\$2,422)	(\$2,179)	1%	(\$242)	0%
Enabling Capabilities	(\$79)	(\$79)	0%	\$0	0%
Integrity Management	(\$4,333)	(\$3,916)	1%	(\$417)	0%
Technology Initiatives	(\$3,262)	(\$3,232)	1%	(\$29)	0%
GIS	(\$42,890)	(\$19,131)	7%	(\$23,760)	13%
AM Program Leadership	(\$2,804)	\$0	0%	(\$2,804)	2%
Engineering, Design, Estimating & Mobility	(\$40,086)	(\$19,131)	7%	(\$20,956)	12%
Legacy Integration	(\$23,334)	(\$22,825)	8%	(\$509)	0%
Remediation & Integration	(\$23,334)	(\$22,825)	8%	(\$509)	0%
Program Management	(\$27,765)	(\$6,609)	2%	(\$21,156)	12%
Gas Business Enablement Portfolio Management Office	(\$20,378)	\$0	0%	(\$20,378)	11%
Solution Architects & Agile Coaches	(\$7,387)	(\$6,609)	2%	(\$778)	0%
Performance	(\$162,821)	(\$96,673)	35%	(\$66,148)	37%
Advanced Asset Management	(\$27,270)	(\$23,091)	8%	(\$4,179)	2%
AM Program Leadership	(\$1,948)	\$0	0%	(\$1,948)	1%
AIPM	(\$7,109)	(\$7,048)	3%	(\$61)	0%
Asset - Advanced Analytics	(\$3,898)	(\$3,703)	1%	(\$195)	0%
Engineering, Design, Estimating & Mobility	(\$14,314)	(\$12,340)	4%	(\$1,974)	1%
Advanced EAM Platform	(\$16,139)	(\$13,634)	5%	(\$2,505)	1%
WMFE Program Leadership	(\$991)	\$0	0%	(\$991)	1%
Projects & Program Management	(\$4,756)	(\$4,281)	2%	(\$476)	0%
Work Management & Field Enablement	(\$10,392)	(\$9,353)	3%	(\$1,039)	1%
Customer Experience & Interactions	(\$54,857)	(\$47,913)	17%	(\$6,945)	4%
Customer Experience Program Leadership	(\$2,919)	\$0	0%	(\$2,919)	2%
Customer Interaction	(\$21,754)	(\$20,666)	7%	(\$1,088)	1%
Structured Experiences	(\$1,387)	\$0	0%	(\$1,387)	1%
Support Interaction	(\$28,681)	(\$27,247)	10%	(\$1,434)	1%
Supporting through Data	(\$117)	\$0	0%	(\$117)	0%
Strategic Change, Talent, & Operating Model	(\$32,561)	(\$3,578)	1%	(\$28,983)	16%
Operating Model & Value Framework	(\$10,239)	\$0	0%	(\$10,239)	6%
Program Business Readiness & Sustainment	(\$7,283)	\$0	0%	(\$7,283)	4%
Program Level People Strategy	(\$15,040)	(\$3,578)	1%	(\$11,461)	6%
Supply Chain	(\$10,852)	\$0	0%	(\$10,852)	6%
Legacy Integration	(\$6,319)	(\$6,319)	2%	\$0	0%
Remediation & Integration	(\$6,319)	(\$6,319)	2%	\$0	0%
Program Management	(\$14,822)	(\$2,138)	1%	(\$12,684)	7%
Gas Business Enablement Portfolio Management Office	(\$12,490)	\$0	0%	(\$12,490)	7%
Solution Architects & Agile Coaches	(\$2,333)	(\$2,138)	1%	(\$194)	0%
Supporting Investments	(\$84,133)	(\$32,217)	11%	(\$51,916)	29%
Data Management	(\$40,283)	(\$11,100)	4%	(\$29,183)	16%
Regulatory/ Compliance	(\$22,000)	(\$3,000)	1%	(\$19,000)	11%
IS Enabling	(\$21,850)	(\$18,117)	6%	(\$3,734)	2%
Enabling Capabilities	(\$18,186)	(\$14,452)	5%	(\$3,734)	2%
Technology Initiatives	(\$3,665)	(\$3,665)	1%	\$0	0%
Total	(\$458,141)	(\$280,205)	61%	(\$177,936)	39%

CONFIDENTIAL



Cost by initiative, year over year (000's)

Category & Initiative	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
Backbone	(\$45,365)	(\$80,946)	(\$58,311)	(\$23,868)	(\$2,698)	\$0	(\$211,187)
Core EAM Platform	(\$23,006)	(\$46,599)	(\$32,882)	(\$13,576)	(\$1,135)	\$0	(\$117,199)
Business Architecture Design	(\$3,755)	\$0	\$0	\$0	\$0	\$0	(\$3,755)
WMFE Program Leadership	(\$786)	(\$1,894)	(\$1,999)	(\$521)	\$0	\$0	(\$5,201)
Work Management & Field Enablement	(\$13,235)	(\$40,756)	(\$29,967)	(\$13,055)	(\$1,135)	\$0	(\$98,148)
Data Management	\$0	(\$2,347)	(\$75)	\$0	\$0	\$0	(\$2,422)
Enabling Capabilities	(\$79)	\$0	\$0	\$0	\$0	\$0	(\$79)
Integrity Management	(\$2,476)	(\$1,015)	(\$841)	\$0	\$0	\$0	(\$4,333)
Technology Initiatives	(\$2,674)	(\$587)	\$0	\$0	\$0	\$0	(\$3,262)
GIS	(\$6,569)	(\$18,689)	(\$14,105)	(\$3,528)	\$0	\$0	(\$42,890)
AM Program Leadership	(\$654)	(\$941)	(\$964)	(\$245)	\$0	\$0	(\$2,804)
Engineering, Design, Estimating & Mobility	(\$5,915)	(\$17,748)	(\$13,141)	(\$3,282)	\$0	\$0	(\$40,086)
Legacy Integration	(\$10,055)	(\$6,991)	(\$3,579)	(\$2,161)	(\$548)	\$0	(\$23,334)
Remediation & Integration	(\$10,055)	(\$6,991)	(\$3,579)	(\$2,161)	(\$548)	\$0	(\$23,334)
Program Management	(\$5,736)	(\$8,666)	(\$7,745)	(\$4,603)	(\$1,015)	\$0	(\$27,765)
Gas Business Enablement Portfolio Management Office	(\$4,082)	(\$5,318)	(\$5,360)	(\$4,603)	(\$1,015)	\$0	(\$20,378)
Solution Architects & Agile Coaches	(\$1,654)	(\$3,348)	(\$2,385)	\$0	\$0	\$0	(\$7,387)
Performance	(\$16,094)	(\$63,988)	(\$37,989)	(\$33,177)	(\$10,924)	(\$669)	(\$162,821)
Advanced Asset Management	(\$2,544)	(\$4,187)	(\$6,936)	(\$12,660)	(\$943)	\$0	(\$27,270)
AM Program Leadership	(\$454)	(\$654)	(\$670)	(\$170)	\$0	\$0	(\$1,948)
AIPM	(\$2,089)	(\$1,612)	(\$799)	(\$2,609)	\$0	\$0	(\$7,109)
Asset - Advanced Analytics	\$0	\$0	\$0	(\$3,780)	(\$118)	\$0	(\$3,898)
Engineering, Design, Estimating & Mobility	\$0	(\$1,921)	(\$5,467)	(\$6,100)	(\$825)	\$0	(\$14,314)
Advanced EAM Platform	(\$150)	(\$361)	(\$766)	(\$8,796)	(\$6,066)	\$0	(\$16,139)
WMFE Program Leadership	(\$150)	(\$361)	(\$381)	(\$99)	\$0	\$0	(\$991)
Projects & Program Management	\$0	\$0	\$0	(\$3,482)	(\$1,274)	\$0	(\$4,756)
Work Management & Field Enablement	\$0	\$0	(\$385)	(\$5,215)	(\$4,792)	\$0	(\$10,392)
Customer Experience & Interactions	(\$1,387)	(\$30,038)	(\$18,027)	(\$4,839)	(\$566)	\$0	(\$54,857)
Customer Experience Program Leadership	\$0	(\$1,041)	(\$1,065)	(\$813)	\$0	\$0	(\$2,919)
Customer Interaction	\$0	(\$8,922)	(\$8,664)	(\$3,601)	(\$566)	\$0	(\$21,754)
Structured Experiences	(\$1,387)	\$0	\$0	\$0	\$0	\$0	(\$1,387)
Support Interaction	\$0	(\$20,075)	(\$8,298)	(\$308)	\$0	\$0	(\$28,681)
Supporting through Data	\$0	\$0	\$0	(\$117)	\$0	\$0	(\$117)
Strategic Change, Talent, & Operating Model	(\$7,689)	(\$13,349)	(\$4,970)	(\$3,295)	(\$2,589)	(\$669)	(\$32,561)
Operating Model & Value Framework	(\$3,660)	(\$5,683)	(\$722)	(\$173)	\$0	\$0	(\$10,239)
Program Business Readiness & Sustainment	(\$526)	(\$2,125)	(\$1,127)	(\$1,352)	(\$1,685)	(\$469)	(\$7,283)
Program Level People Strategy	(\$3,503)	(\$5,541)	(\$3,122)	(\$1,770)	(\$904)	(\$200)	(\$15,040)
Supply Chain	\$0	(\$9,104)	(\$1,748)	\$0	\$0	\$0	(\$10,852)
Legacy Integration	(\$1,300)	(\$2,613)	(\$1,504)	(\$765)	(\$137)	\$0	(\$6,319)
Remediation & Integration	(\$1,300)	(\$2,613)	(\$1,504)	(\$765)	(\$137)	\$0	(\$6,319)
Program Management	(\$3,024)	(\$4,317)	(\$4,038)	(\$2,821)	(\$622)	\$0	(\$14,822)
Gas Business Enablement Portfolio Management Office	(\$2,502)	(\$3,260)	(\$3,285)	(\$2,821)	(\$622)	\$0	(\$12,490)
Solution Architects & Agile Coaches	(\$522)	(\$1,057)	(\$753)	\$0	\$0	\$0	(\$2,333)
Supporting Investments	(\$23,017)	(\$23,827)	(\$18,731)	(\$11,885)	(\$5,798)	(\$875)	(\$84,133)
Data Management	(\$14,481)	(\$8,122)	(\$7,152)	(\$6,870)	(\$3,658)	\$0	(\$40,283)
Regulatory/ Compliance	(\$3,900)	(\$10,500)	(\$7,100)	(\$500)	\$0	\$0	(\$22,000)
IS Enabling	(\$4,636)	(\$5,205)	(\$4,480)	(\$4,515)	(\$2,140)	(\$875)	(\$21,850)
Enabling Capabilities	(\$4,031)	(\$4,284)	(\$3,448)	(\$3,563)	(\$1,985)	(\$875)	(\$18,186)
Technology Initiatives	(\$605)	(\$921)	(\$1,032)	(\$953)	(\$155)	\$0	(\$3,665)
Total	(\$84,476)	(\$168,741)	(\$115,032)	(\$68,930)	(\$19,419)	(\$1,544)	(\$458,141)

CONFIDENTIAL



Cost detail by category, capex / opex (000's)

Cost Category	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	Total
O&M	(\$30,188)	(\$68,192)	(\$45,094)	(\$23,857)	(\$9,800)	(\$806)	(\$177,936)
Labor	(\$21,549)	(\$43,893)	(\$29,445)	(\$22,031)	(\$9,313)	(\$755)	(\$126,988)
External	(\$12,801)	(\$25,814)	(\$13,137)	(\$8,849)	(\$3,398)	(\$312)	(\$64,310)
OnShore	(\$12,284)	(\$23,217)	(\$11,918)	(\$7,797)	(\$2,860)	(\$301)	(\$58,376)
Application Maintenance Provider	(\$15)	(\$95)	(\$12)	(\$12)	\$0	\$0	(\$135)
Business / Management Consultant	(\$8,557)	(\$17,494)	(\$7,695)	(\$4,009)	(\$1,442)	(\$161)	(\$39,358)
System Integrator	(\$3,712)	(\$5,628)	(\$4,210)	(\$3,776)	(\$1,418)	(\$140)	(\$18,883)
OffShore	(\$517)	(\$2,597)	(\$1,219)	(\$1,052)	(\$538)	(\$11)	(\$5,935)
Application Maintenance Provider	\$0	(\$20)	\$0	\$0	\$0	\$0	(\$20)
Business / Management Consultant	(\$74)	(\$766)	\$0	\$0	\$0	\$0	(\$841)
System Integrator	(\$442)	(\$1,811)	(\$1,219)	(\$1,052)	(\$538)	(\$11)	(\$5,074)
Internal	(\$8,749)	(\$18,079)	(\$16,308)	(\$13,182)	(\$5,916)	(\$443)	(\$62,677)
Executive Business	(\$2,911)	(\$6,264)	(\$5,992)	(\$2,617)	(\$263)	\$0	(\$18,046)
IS	(\$3,999)	(\$7,898)	(\$6,350)	(\$5,751)	(\$4,275)	(\$443)	(\$28,717)
IS	(\$1,839)	(\$3,917)	(\$3,965)	(\$4,814)	(\$1,378)	\$0	(\$15,914)
Contractor / 3rd Party Expenses	(\$6,550)	(\$20,352)	(\$13,623)	(\$500)	\$0	\$0	(\$41,025)
Expenses	(\$2,088)	(\$3,947)	(\$2,026)	(\$1,325)	(\$486)	(\$51)	(\$9,924)
CapEx	(\$54,288)	(\$100,549)	(\$69,937)	(\$45,073)	(\$9,620)	(\$738)	(\$280,205)
Software	(\$23,963)	(\$9,163)	(\$4,080)	(\$2,498)	(\$50)	\$0	(\$39,753)
Hardware	(\$2,162)	(\$5,340)	(\$3,603)	\$0	\$0	\$0	(\$11,105)
Labor	(\$25,367)	(\$57,888)	(\$47,589)	(\$38,309)	(\$8,626)	(\$642)	(\$178,422)
External	(\$21,293)	(\$48,097)	(\$39,567)	(\$31,116)	(\$6,745)	(\$604)	(\$147,422)
OnShore	(\$16,444)	(\$36,936)	(\$33,351)	(\$25,097)	(\$5,553)	(\$561)	(\$117,942)
Application Maintenance Provider	(\$61)	(\$852)	(\$112)	(\$112)	\$0	\$0	(\$1,137)
Business / Management Consultant	(\$4,360)	(\$3,990)	(\$2,491)	(\$2,311)	(\$70)	\$0	(\$13,224)
System Integrator	(\$12,023)	(\$32,094)	(\$30,748)	(\$22,673)	(\$5,482)	(\$561)	(\$103,581)
OffShore	(\$4,849)	(\$11,161)	(\$6,215)	(\$6,019)	(\$1,193)	(\$43)	(\$29,480)
Application Maintenance Provider	(\$1,252)	(\$2,655)	(\$204)	\$0	\$0	\$0	(\$4,110)
Business / Management Consultant	(\$372)	\$0	\$0	\$0	\$0	\$0	(\$372)
System Integrator	(\$3,225)	(\$8,506)	(\$6,012)	(\$6,019)	(\$1,193)	(\$43)	(\$24,998)
Internal	(\$4,075)	(\$9,791)	(\$8,023)	(\$7,193)	(\$1,880)	(\$38)	(\$31,000)
Executive Business	(\$774)	(\$1,371)	(\$2,079)	(\$1,092)	(\$273)	\$0	(\$5,590)
Business	(\$2,068)	(\$3,786)	(\$3,453)	(\$3,222)	(\$942)	(\$38)	(\$13,509)
IS	(\$1,232)	(\$4,635)	(\$2,491)	(\$2,878)	(\$665)	\$0	(\$11,901)
Contractor / 3rd Party Expenses	\$0	(\$21,880)	(\$8,995)	\$0	\$0	\$0	(\$30,875)
Expenses	(\$2,795)	(\$6,279)	(\$5,670)	(\$4,267)	(\$944)	(\$95)	(\$20,050)
Total	(\$84,476)	(\$168,741)	(\$115,032)	(\$68,930)	(\$19,419)	(\$1,544)	(\$458,141)

CONFIDENTIAL



Benefits by initiative, capex / opex (000's)

Initiative	Total O&M Benefit	Total CapEx Benefit	Total Benefit
AIPM	\$ -	\$ -	\$ -
Asset - Advanced Analytics	\$ 1,980,000	\$ -	\$ 1,980,000
Customer Interaction	\$ 2,383,948	\$ -	\$ 2,383,948
Data Management	\$ 647,186	\$ 114,209	\$ 761,396
Engineering, Design, Estimating & Mobility	\$ 1,163,805	\$ 954,495	\$ 2,118,300
Integrated Supply & Demand Planning	\$ 330,200	\$ 2,209,800	\$ 2,540,000
Integrated Supply Feasibility Evaluation and Strategy	\$ -	\$ -	\$ -
Inventory Optimization	\$ -	\$ -	\$ -
Regulatory/ Compliance	\$ 13,520,800	\$ -	\$ 13,520,800
Work Management & Field Enablement	\$ 11,943,042	\$ 4,367,762	\$ 16,310,804
Grand Total	\$ 31,968,981	\$ 7,646,267	\$ 39,615,248

* Note: Work Management & Field Enablement contains Data Management benefits

CONFIDENTIAL



Benefits by initiative, year over year (000's)

Initiative	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023	FY2024	FY2025	FY2026
AIPM	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Asset - Advanced Analytics	\$0	\$0	\$0	\$13,750	\$1,223,750	\$1,980,000	\$1,980,000	\$1,980,000	\$1,980,000
Customer Interaction	\$0	\$0	\$0	\$61,278	\$502,480	\$1,860,208	\$2,383,948	\$2,383,948	\$2,383,948
Data Management	\$0	\$0	\$105,749	\$750,821	\$761,396	\$761,396	\$761,396	\$761,396	\$761,396
Engineering, Design, Estimating & Mobility	\$0	\$143,315	\$582,193	\$1,132,045	\$1,565,272	\$2,118,300	\$2,118,300	\$2,118,300	\$2,118,300
Integrated Supply & Demand Planning	\$0	\$0	\$35,278	\$2,187,222	\$2,540,000	\$2,540,000	\$2,540,000	\$2,540,000	\$2,540,000
Integrated Supply Feasibility Evaluation and Strategy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Inventory Optimization	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Regulatory/ Compliance	\$0	\$876,348	\$5,070,300	\$9,577,233	\$13,207,819	\$13,520,800	\$13,520,800	\$13,520,800	\$13,520,800
Work Management & Field Enablement	\$0	\$0	\$1,978,971	\$10,475,779	\$10,874,265	\$13,613,533	\$16,310,804	\$16,310,804	\$16,310,804
Grand Total	\$0	\$1,019,663	\$7,772,492	\$24,198,128	\$30,674,982	\$36,394,237	\$39,615,248	\$39,615,248	\$39,615,248

CONFIDENTIAL



Benefits by operating company, capex / opex (000's)

Operating Company	Total O&M Benefit	Total CapEx Benefit	Total Benefit
Boston Gas	\$ 4,144,024	\$ 2,029,060	\$ 6,173,083
Brooklyn Union Gas (KEDNY)	\$ 12,161,205	\$ 1,942,221	\$ 14,103,426
Colonial Gas	\$ 806,069	\$ 407,517	\$ 1,213,586
Keyspan Gas East (KEDLI)	\$ 2,402,076	\$ 1,320,565	\$ 3,722,641
Narragansett Gas	\$ 1,317,229	\$ 720,239	\$ 2,037,468
NiagaraMohawk Gas	\$ 11,138,377	\$ 1,226,665	\$ 12,365,042
Total	\$ 31,968,981	\$ 7,646,267	\$ 39,615,248

CONFIDENTIAL



NPV Analysis Assumptions

Inputs	
Depreciation	Composite Rate / Useful Life
Hardware - Book	2.9%
Hardware - MACRS	5
Software – Book	2.9%
Software – MACRS	7
Plant & Machinery - Book	2.9%
Plant & Machinery - MACRS	20
Depreciation	Values
After-tax WACC	9.89%
Marginal Corporate Tax Rate	40.00%
Growth Rate	Values
Terminal Value Growth Rate	2%

Sources: Book Depreciation % - Sam McClemtont; MACRS Useful Life – Howard Kamenski; WAAC MA: William Richer; WAAC RI: Melissa Little; WAAC NY: Melissa Barnes; Marginal Corporate Tax Rate – Christine Yordt; WAAC calculated as the average across the operating companies using the general allocator; terminal value growth rate calculated at 2% assuming costs and benefits will increase with inflation