

1 **VECC INTERROGATORY 12**

2 6.0 Market Renewal Program

3 **INTERROGATORY**

4 6.1 Reference A-2-2, pg. 18

5 a) Please provide an update as to the expected completion date of the MRP business  
6 case.

7 b) Does the IESO intend on circulating for comment a draft of the MRP business case?

8 **RESPONSE**

9 a) The IESO intends to complete the MRP business case by the end of Q3 2019.

10 b) Please refer to APPrO Interrogatory 11 k), at Exhibit I, Tab 6.2, Schedule 11.11.



**EDA INTERROGATORY 4**

Issue 6.0

**INTERROGATORY**

EDA interrogatory 4

Reference: Exhibit C, Tab 2, Schedule 1, pg. 4-5

Preamble: The MRP Benefits Case does not speak to the potential costs that may be borne by LDCs with respect to the implementation of MRP.

Questions

- a) Please provide information with respect to how these costs might be incorporated into the Business Case.
- b) Please identify who is responsible for identifying, quantifying and incorporating those costs into the Business Case.
- c) Please provide information with respect to how the IESO plans on engaging with LDCs to minimize system-wide implementation costs.

**RESPONSE**

- a) To estimate stakeholder costs the 2017 Benefits Case requested stakeholder feedback and conducted jurisdictional scans of implementation costs in similar markets. The stakeholder feedback was insufficient to draw firm conclusions, and the jurisdictional scan indicated a wide variance in IT and business process costs even for similar organizations. For these reasons, the 2017 Benefits Case assessed stakeholder implementation costs on a qualitative basis only.

As part of the Business Case and net benefits assessment, IESO will be engaging with stakeholders to further understand Market Participant costs based on the High Level Design decisions published in 2018 and early 2019.

- b) The IESO will work with stakeholders to identify and understand the most appropriate way to represent and incorporate Market Participant costs in the Business Case. The IESO will engage stakeholders on MRP-wide items, including Market Participant costs,

1 through a series of MRP Stakeholder meetings, the first of which will be in early May,  
2 2019.

- 3 c) The IESO is proposing a new “MRP Bi-Monthly Meeting” to engage stakeholders on  
4 MRP-wide items, including development of the MRP Business Case. Areas of the MRP  
5 Business Case engagement will include: modelling approach and the alternative case,  
6 market participant costs, changes in costs/benefits compared to the benefits case and  
7 risks and mitigation strategies. This bi-monthly forum where the business case will be  
8 discussed will be open to all stakeholders, including LDCs, and will run in parallel with  
9 the more specific, technical engagement sessions to support the development of the  
10 detailed designs for the Energy and Capacity streams.



**OEB STAFF INTERROGATORY 23**

**6.0 Market Renewal Program**

***6.1 Is the reporting on financial and operational performance of the Market Renewal Program for 2017, 2018, 2019, and proposed future reporting, appropriate?***

**Staff IR #23**

**INTERROGATORY**

Reference: Exhibit A-2-1. Attachment 1 Pg. 1 of 6

Preamble:

In regard to the MRP Baseline Schedules the IESO states:

The IESO has established baseline schedules for the MRP in 2019. The schedule for the Energy work stream in 2019 is provided as **Attachment 1** and the schedule for the Capacity work stream in 2019 is provided as **Attachment 2**. These schedules provide a summary of the major pieces of work that will be undertaken during the 2019 timeframe. Underpinning these schedules are detailed activities carried out by individuals or groups on a monthly, weekly, or daily basis as applicable.

Questions:

- a) Why does the IESO consider that an annual update to Attachments 1 and 2 is sufficient in keeping the OEB abreast of the MRP budget and schedule? Given the level of expenditures and activity in the upcoming 2 years would quarterly reporting to OEB not provide an earlier indication of potential variances?
- b) How will the work activities in Attachments 1 and 2 that fall behind and over budget be flagged?

**RESPONSE**

- a) The IESO submits its revenue submission to the OEB on an annual basis. Submitting annual updates for MRP is consistent with that process. The IESO incorporates project governance controls on all of its projects, with reporting commensurate with those controls within the IESO's governance framework.

- 1        b) The IESO has established a governance framework for the MRP. Reporting progress
- 2        against budget and identification of any variances is part of that governance framework.
- 3        Please refer to SEC Interrogatory 16, at Exhibit I, Tab 6.1, Schedule 10.16.

**OEB STAFF INTERROGATORY 24**

**6.0 Market Renewal Program**

***6.1 Is the reporting on financial and operational performance of the Market Renewal Program for 2017, 2018, 2019, and proposed future reporting, appropriate?***

**Staff IR #24**

**INTERROGATORY**

Reference: Exhibit A-2-1. Attachment 1 Pg. 2, 3 of 6

Preamble:

In regard to the Schedule Performance Index & Cost performance Index (SPI &CPI) the IESO states:

As described in the IESO's MRP Cost Report within its 2018 Revenue Requirement Submission (EB-2018-0143), the baseline schedules and budget form the foundation that will enable the IESO to begin tracking performance measures such as SPI and CPI beginning January 1, 2019 for both MRP work streams.

And

For the MRP, the IESO will be calculating earned value at the work stream level. SPI and CPI will be calculated on a monthly basis for each of the Energy work stream and Capacity work stream to arrive at an annual SPI and CPI for each individual work stream and the overall MRP at the end of 2019.

Questions:

- a) Please provide SPI and CPI monthly values to April 9, 2019.
- b) What are the early indications for the project from both of these performance measures?  
Do the results meet with the IESO's expectations at this point in the project?

**RESPONSE**

- a) Monthly SPI and CPI values for Energy, Capacity, and MRP total are provide in the table below:

Earned Value Analysis - 2019						
Month	Energy		Capacity		MRP <sup>*1</sup>	
	SPI	CPI	SPI	CPI	SPI	CPI
Jan-19	0.79	2.37	1.17	3.24	0.95	2.75
Feb-19	0.70	1.69	0.92	2.35	0.79	1.94
Mar-19	0.70	1.32	0.89	2.11	0.77	1.58

**Note:-** <sup>\*1</sup> MRP total SPI and CPI are based on Energy and Capacity schedules and costs.

- b) On a multi-year program, these indices (like any other metrics) are best utilized over an appropriate timeframe. The first three months of 2019 are not a large enough sample to draw conclusions at this time.

**ENERGY PROBE INTERROGATORY 19**

**Issue 6.1 Is the reporting on financial and operational performance of the Market Renewal Program for 2017, 2018, 2019, and proposed future reporting, appropriate?**

**INTERROGATORY**

**EP-19**

**Reference:** Exhibit C-2-1, Attachment 1, Appendix A

**Preamble:** *“Beginning in January 2019, the IESO will monitor and track project performance for both the Capacity and Energy work streams against the established baseline schedules and budget described below. The schedules and budget for the Energy and Capacity work streams will be tracked and will roll up to form the overall MRP schedule and budget.”*

a) Please provide an update on Market Renewal spending for 2018 and a detailed report whether IESO on track to meet its forecasted budgets.

b) For 2019, based on Q1 results, please provide a schedule that indicates for each initiative, if it is on time and budget. Provide relevant comments/discussion.

**RESPONSE**

a) At the end of the first quarter, on a combined basis, operating and capital expenses for the Market Renewal program were underspent by \$2.2 million, but the IESO is forecasting to spend the entire MRP budget in 2019.

**Total Results (In \$ millions)**

	As of March 31, 2019		
	Actual	Budget	Variance
<b>MRP Program</b>	<b>4.8</b>	<b>7.0</b>	<b>2.2</b>

Operating expenses are \$0.9 million below plan due to delayed resourcing for the capacity work stream and offset by additional follow up on the energy high level design as a result of stakeholder feedback.

Operating Results (In \$ millions)			
	As of March 31, 2019		
Cost Category	Actual	Budget	Variance
Compensation & Benefits	1.7	2.5	0.8
Professional & Consulting	1.1	1.0	(0.1)
Operating & Administration	0.1	0.3	0.2
<b>Operating Results</b>	<b>2.9</b>	<b>3.8</b>	<b>0.9</b>

Capital expenses are \$1.3 million lower than planned as energy resources have been completing additional high level design work which is an operating expense. Professional & consulting cost is also tracking under budget, as the procurement for the detailed design consultant will be completed in Q2.

Capital Results (In \$ millions)			
	As of March 31, 2019		
Cost Category	Actual	Budget	Variance
Compensation & Benefits	1.1	1.8	0.7
Professional & Consulting	0.7	1.3	0.6
Operating & Administration	0.1	0.2	0.1
Interest	0.0	0.0	0.0
<b>Capital Results</b>	<b>1.9</b>	<b>3.2</b>	<b>1.3</b>

b) Please see the response to OEB Staff Interrogatory 24 a), at Exhibit I, Tab 6.1, Schedule 1.24. As of March 31, 2019 both Energy and Capacity costs are tracking under budget. Capacity schedule is slightly behind at an SPI of 0.89, while Energy schedule is further lagging at a SPI of 0.7.

**SEC INTERROGATORY 16**

**1.1-SEC-16**

**INTERROGATORY**

Please provide a copy of all material provided to the Board of Directors and Senior Management regarding Market Renewal work plans, approvals, budgets and updates, since those filed in response to SEC IR 20 in EB-2018-0143 (Exhibit I, Tab 6.2, Schedule 8.20 SEC 20).

## RESPONSE

MRP materials provided to the Board of Directors and Senior Management since those filed in response to SEC IR 20 in EB-2018-0143 are provided as Attachment 1 to this response.





# MARKET RENEWAL PROGRAM DASHBOARD

## Key Summary

### Schedule

The program is overall slightly behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.93. This is in the Green category. Within the program, the Energy work stream SPI is 0.97 (Green) which is consistent from last month, while the Capacity work stream SPI is 0.88 (Yellow) which is slip from the previous month.

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.27. This is in the Green category, and corresponds to the SPI being less than 1. The program has not been able to spend the budgeted money on the consultants and resources as planned in the schedule, resulting in an overall underspend against the forecast. The Energy work stream CPI is 1.20 while the Capacity work stream CPI is 1.26.

### Risk

Risk consultant, KPMG, is working jointly with the MRP and Enterprise Risk teams. They are currently working on the refinement of existing IESO Risk Assessment Framework, which includes: 1) Gap analysis between the Project Risk Framework (PRF) and Enterprise Risk Management (ERM), and 2) identifying leading best practices into integrate with PRF and ERM.

### Upcoming Milestones

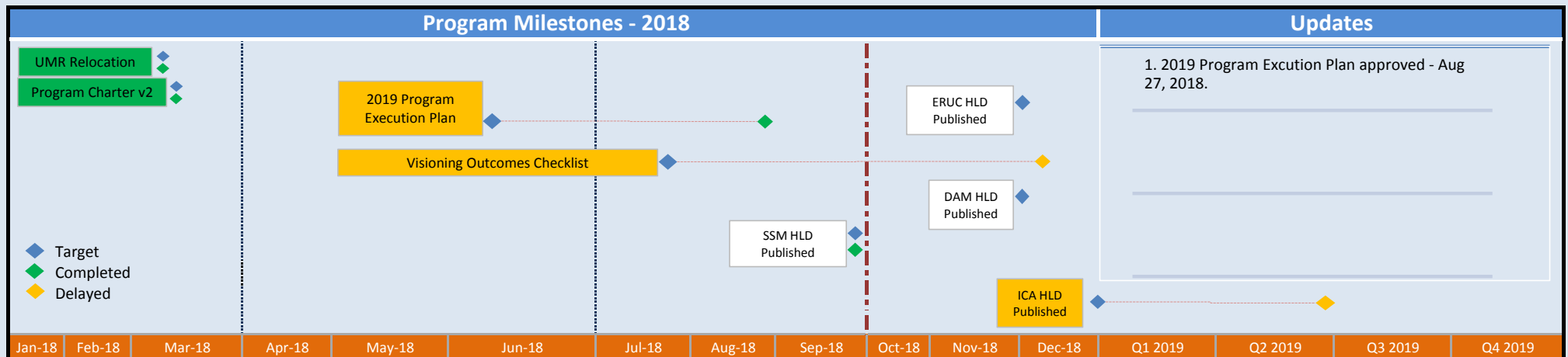
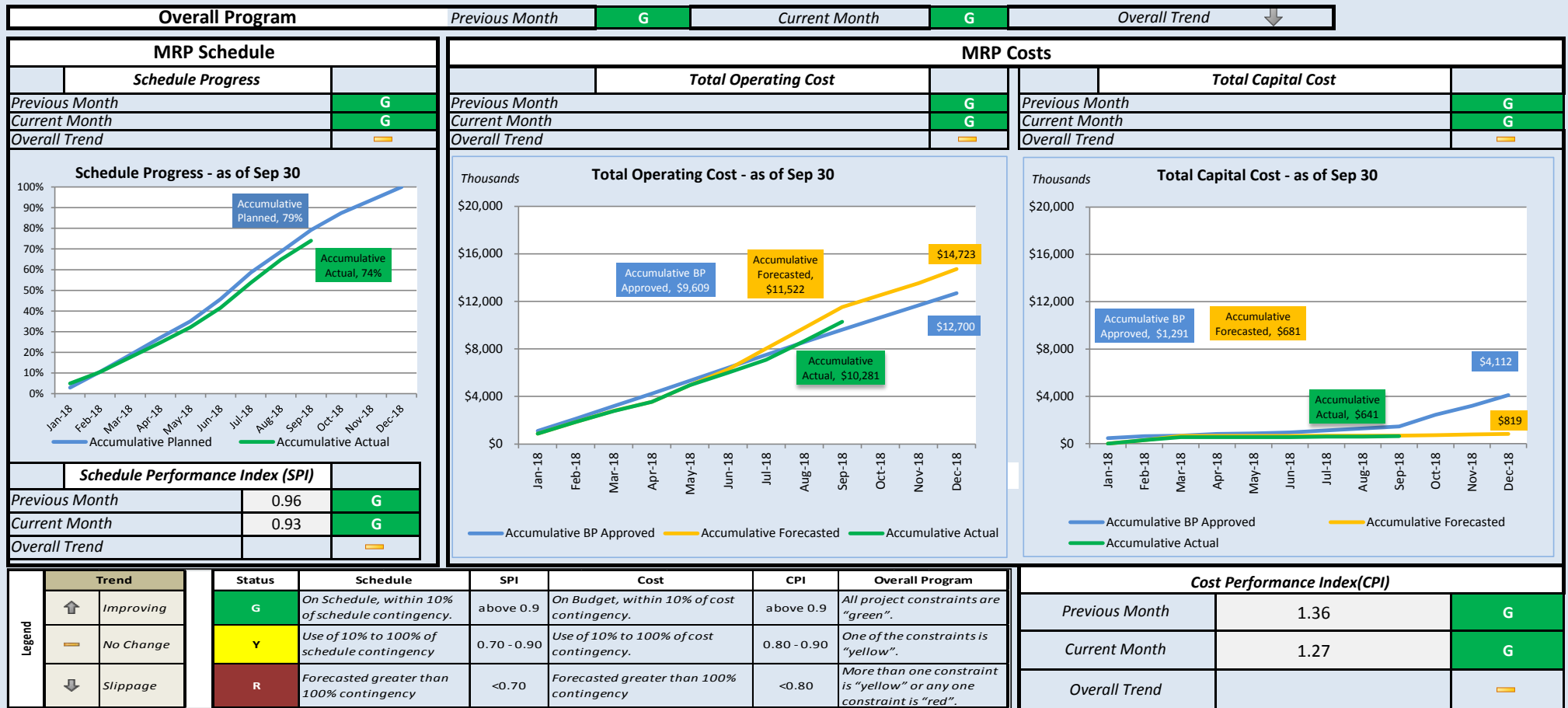
The High Level Design document for the Single Schedule Market (SSM) within the Energy work stream was published on September 27, 2018 for stakeholder review and feedback. The remaining high level designs for the Energy work stream are scheduled for December 2018.

Schedule, Cost, Risk, and Milestone data as of September 30, 2018.

Prepared: October 15, 2018

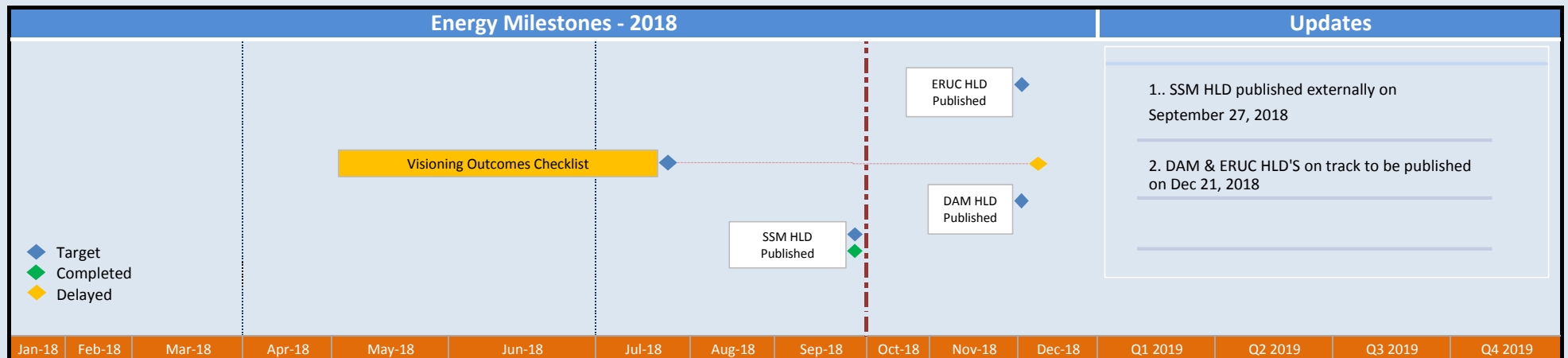
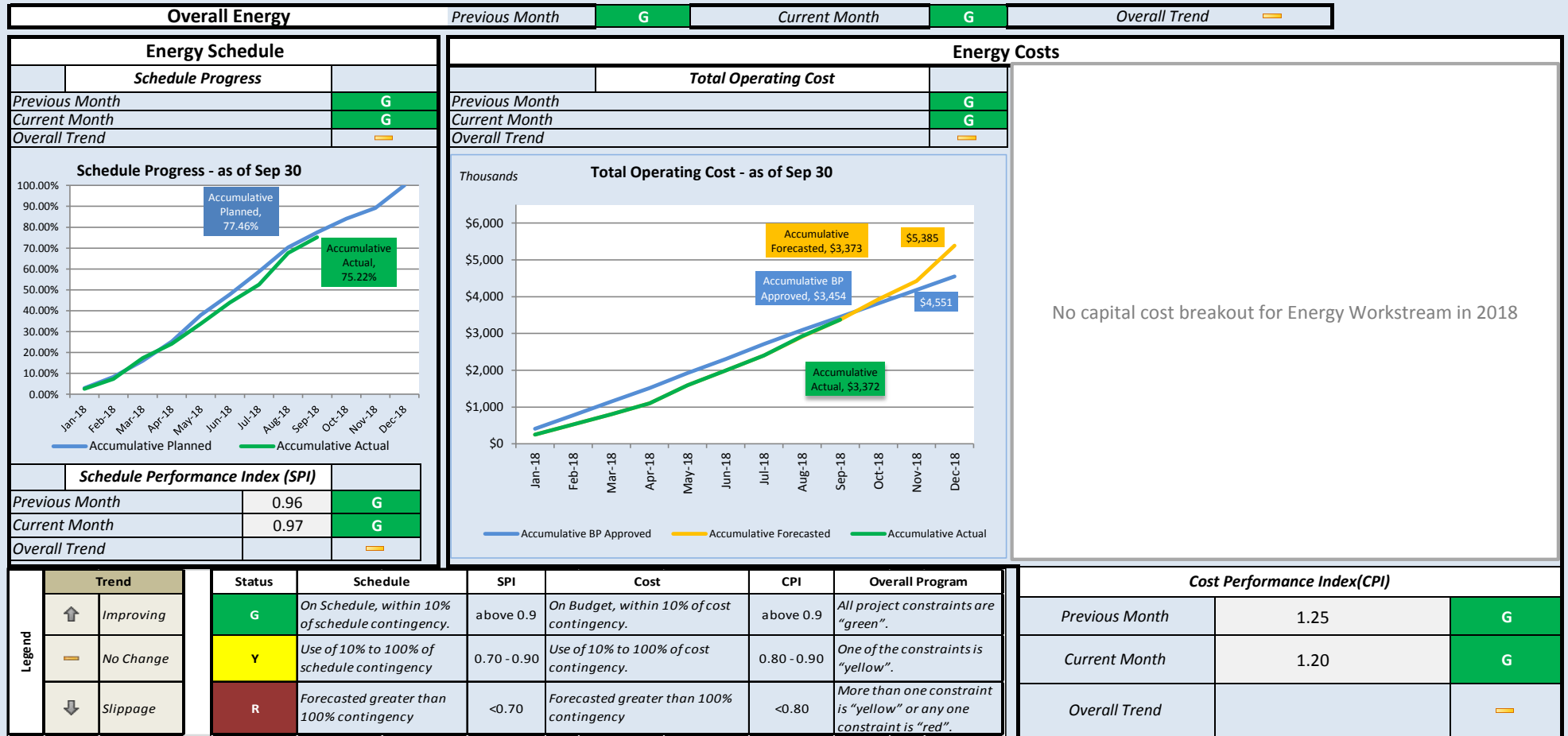
Audit Committee Meeting: October 23, 2018

Board of Directors Meeting: October 24, 2018



# ENERGY WORKSTREAM DASHBOARD

Status Date:  
October 2018



# CAPACITY WORKSTREAM DASHBOARD

## Overall Capacity

Previous Month

G

Current Month

Y

Overall Trend

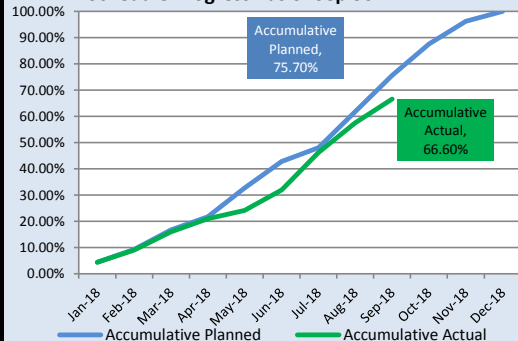


### Capacity Schedule

#### Schedule Progress

Previous Month	G
Current Month	Y
Overall Trend	↓

#### Schedule Progress - as of Sep 30



#### Schedule Performance Index (SPI)

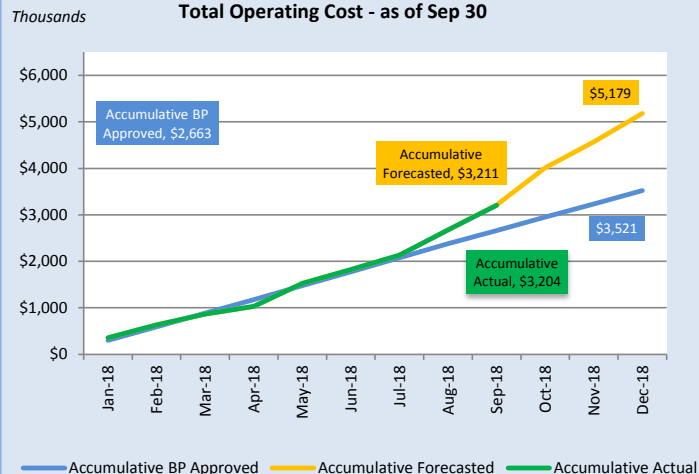
Previous Month	0.93	G
Current Month	0.88	Y
Overall Trend		↓

### Capacity Costs

#### Total Operating Cost

Previous Month	G
Current Month	G
Overall Trend	→

#### Total Operating Cost - as of Sep 30



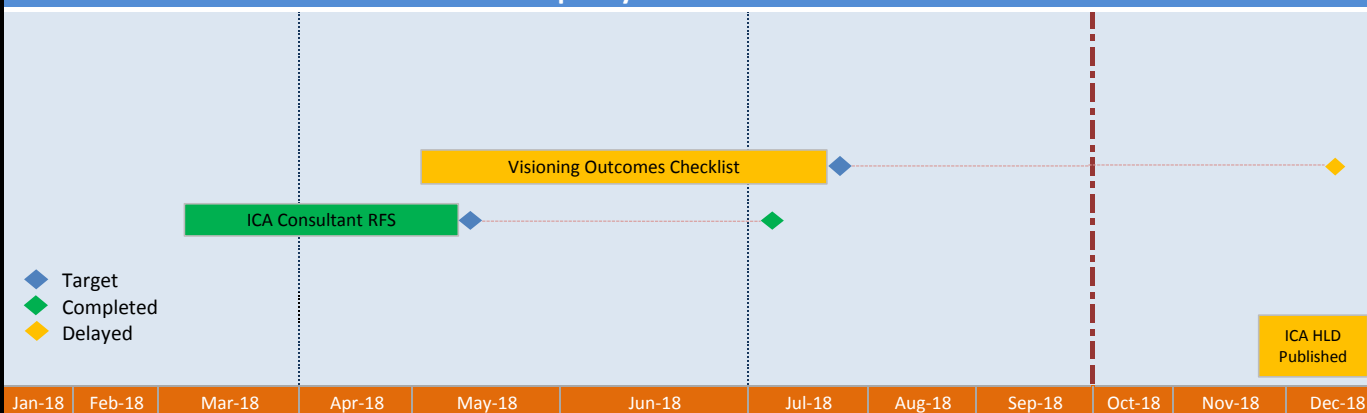
No capital cost breakout for Capacity Workstream in 2018

Legend	Trend		Status	Schedule	SPI	Cost	CPI	Overall Program
	↑	Improving	G	On Schedule, within 10% of schedule contingency.	above 0.9	On Budget, within 10% of cost contingency.	above 0.9	All project constraints are "green".
	→	No Change	Y	Use of 10% to 100% of schedule contingency	0.70 - 0.90	Use of 10% to 100% of cost contingency.	0.80 - 0.90	One of the constraints is "yellow".
	↓	Slippage	R	Forecasted greater than 100% contingency	<0.70	Forecasted greater than 100% contingency	<0.80	More than one constraint is "yellow" or any one constraint is "red".

### Cost Performance Index (CPI)

Previous Month	1.30	G
Current Month	1.26	G
Overall Trend		→

## Capacity Milestones - 2018



## Updates

- ICA RFS Contract signed and consultant on boarded in July.
- ICA HLD available for internal review in Dec 2018.

ICA HLD Published

# MARKET RENEWAL PROGRAM DASHBOARD

## Key Summary

### Schedule

The program is overall slightly behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.92. This value is in the Green category. Within the program, the Energy work stream SPI is 0.98 (Green), which is consistent with last month; the Capacity work stream SPI is 0.84 (Yellow), which is a slip from last month.

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.06. This value is in the Green category, and corresponds to the SPI being less than 1. The program has not been able to spend the budgeted money on the consultants and resources as planned in the schedule, resulting in an overall underspend against the forecast. The Energy work stream CPI is 1.00 while the Capacity work stream CPI is 1.08.

### Risk

Risk consultant, KPMG, is working jointly with the MRP and Enterprise Risk teams. The Project Management Office (PMO) Risk Methodology has been revised and now aligns with Enterprise Risk Management (ERM) model. Next steps will be to roll out within Enterprise change by end Jan 2019. Post MRP Risk Interview findings completed, and finding to be presented to Market Renewal Executive Steering Committee (MRESC).

### Upcoming Milestones

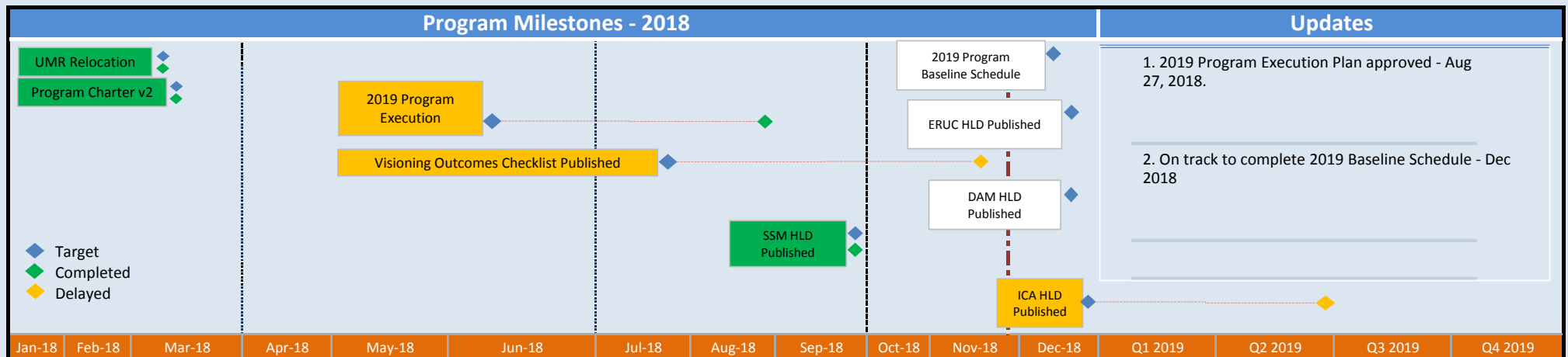
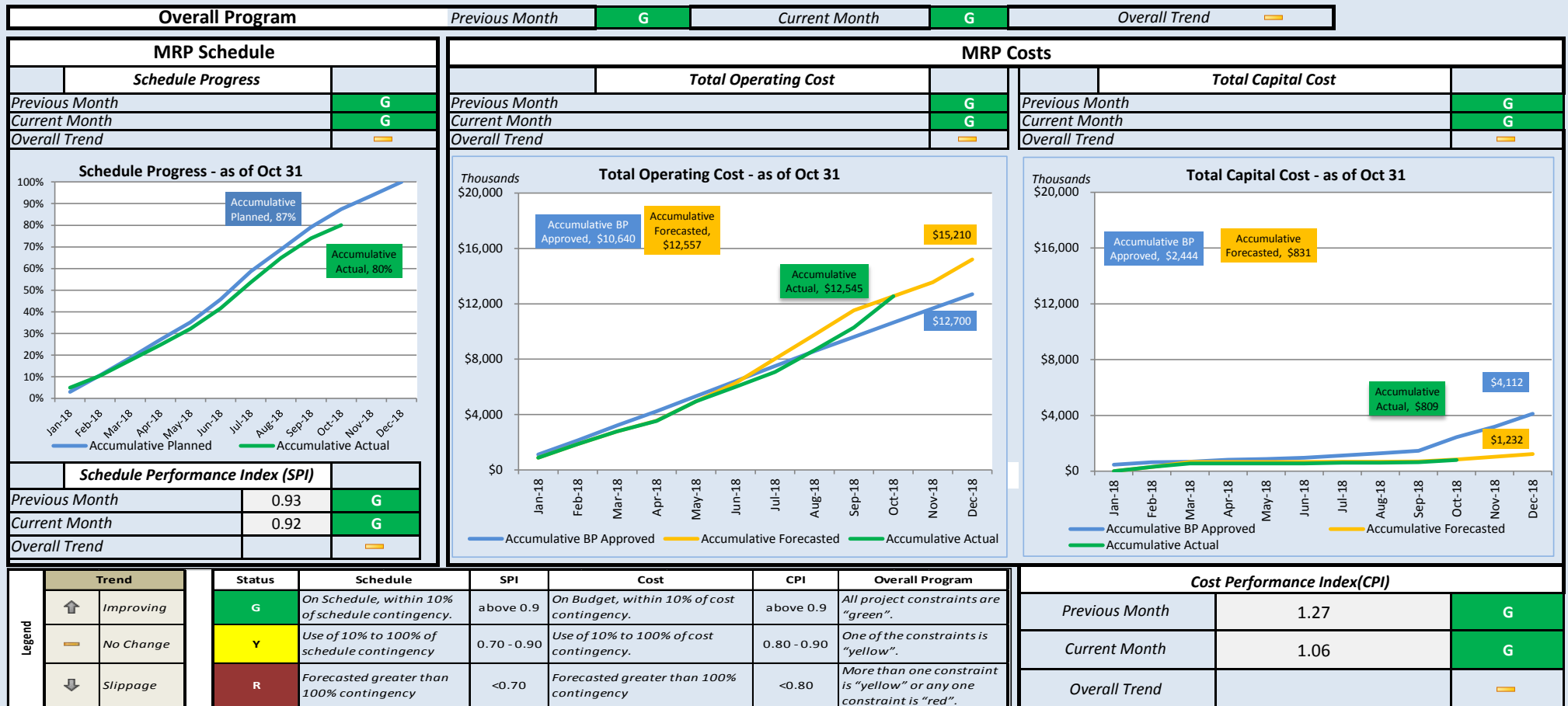
External stakeholder feedback on the High Level Design document for the Single Schedule Market (SSM) is due on November 22. The remaining high level designs for the Energy work stream are scheduled to be published in December 2018.

Schedule, Cost, Risk, and Milestone data as of October 31, 2018

Prepared: November 13, 2018

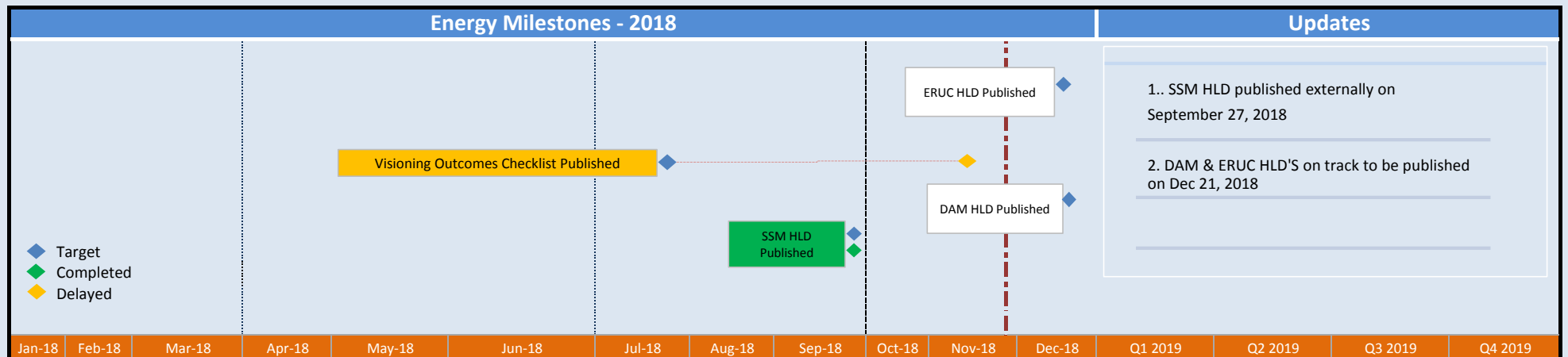
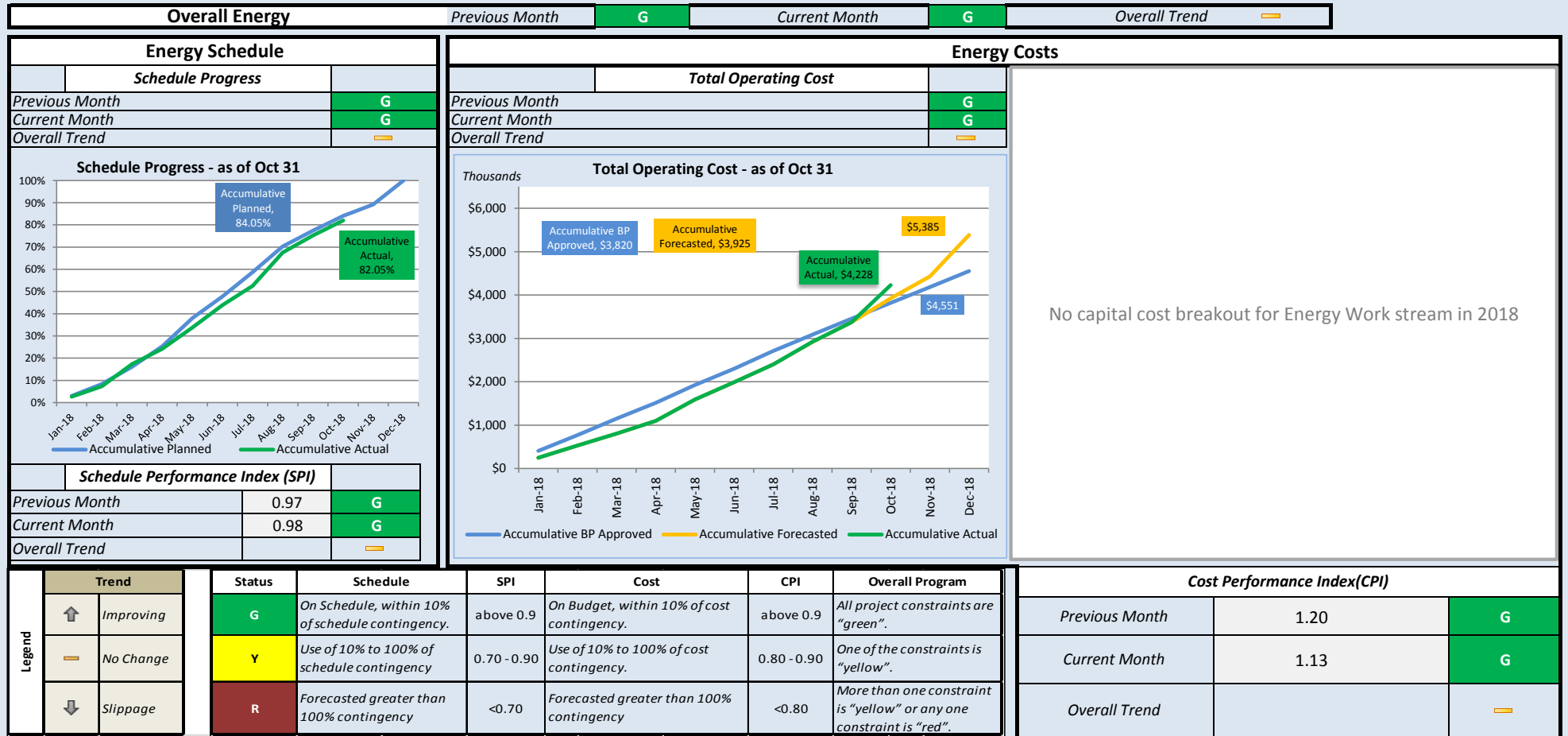
Audit Committee Meeting: December 4, 2018

Board of Directors Meeting: December 5, 2018



# ENERGY WORKSTREAM DASHBOARD

Status Date:  
November 2018



# CAPACITY WORKSTREAM DASHBOARD

## Overall Capacity

Previous Month

Y

Current Month

Y

Overall Trend

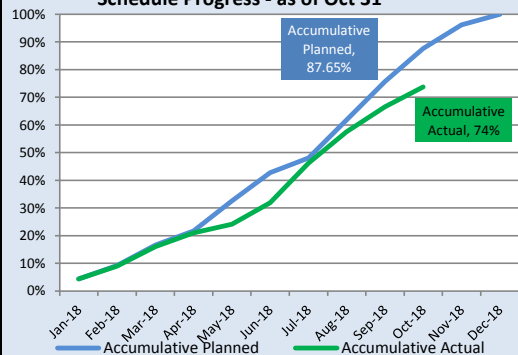
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### Capacity Schedule

#### Schedule Progress

Previous Month	Y
Current Month	Y
Overall Trend	—

#### Schedule Progress - as of Oct 31



#### Schedule Performance Index (SPI)

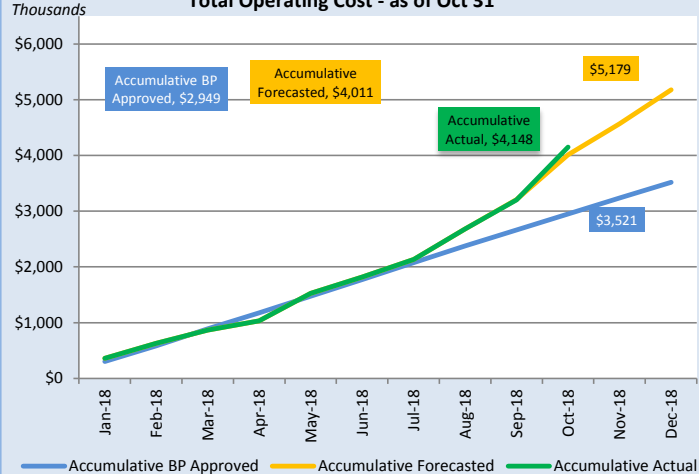
Previous Month	0.88	Y
Current Month	0.84	Y
Overall Trend		—

### Capacity Costs

#### Total Operating Cost

Previous Month	G
Current Month	G
Overall Trend	—

#### Total Operating Cost - as of Oct 31



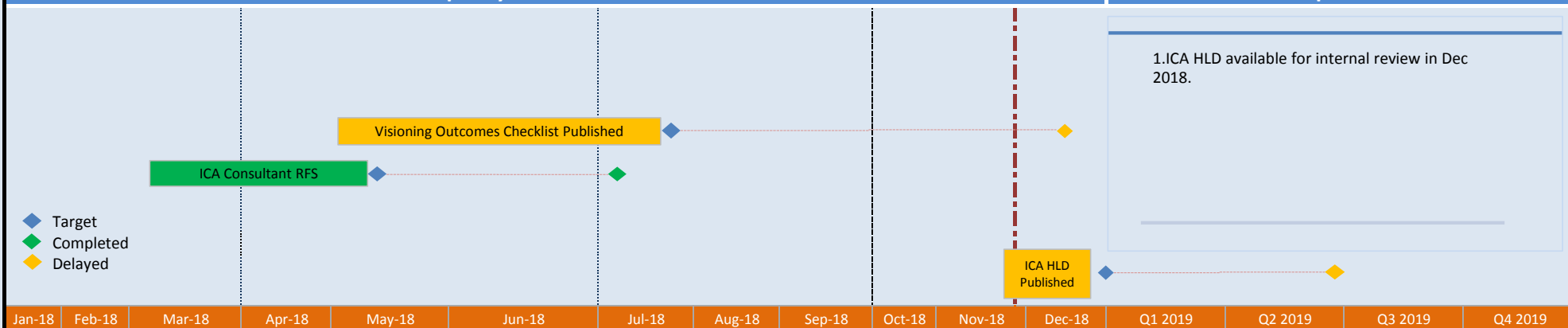
No capital cost breakout for Capacity Work stream in 2018

Legend	Trend		Status	Schedule	SPI	Cost	CPI	Overall Program
	⬆	Improving						
	▬	No Change						
	⬇	Slippage						
	G	On Schedule, within 10% of schedule contingency.	above 0.9	On Budget, within 10% of cost contingency.	above 0.9	All project constraints are "green".		
	Y	Use of 10% to 100% of schedule contingency	0.70 - 0.90	Use of 10% to 100% of cost contingency.	0.80 - 0.90	One of the constraints is "yellow".		
	R	Forecasted greater than 100% contingency	<0.70	Forecasted greater than 100% contingency	<0.80	More than one constraint is "yellow" or any one constraint is "red".		

### Cost Performance Index(CPI)

Previous Month	1.26	G
Current Month	1.08	G
Overall Trend		—

## Capacity Milestones - 2018

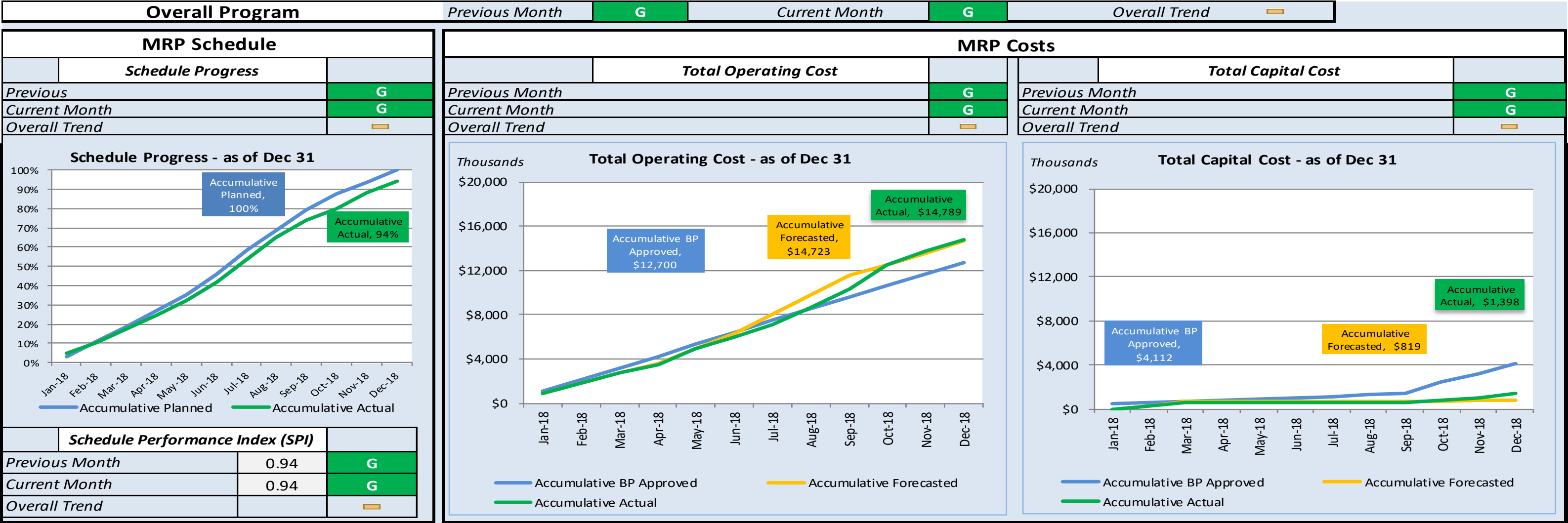


## Updates

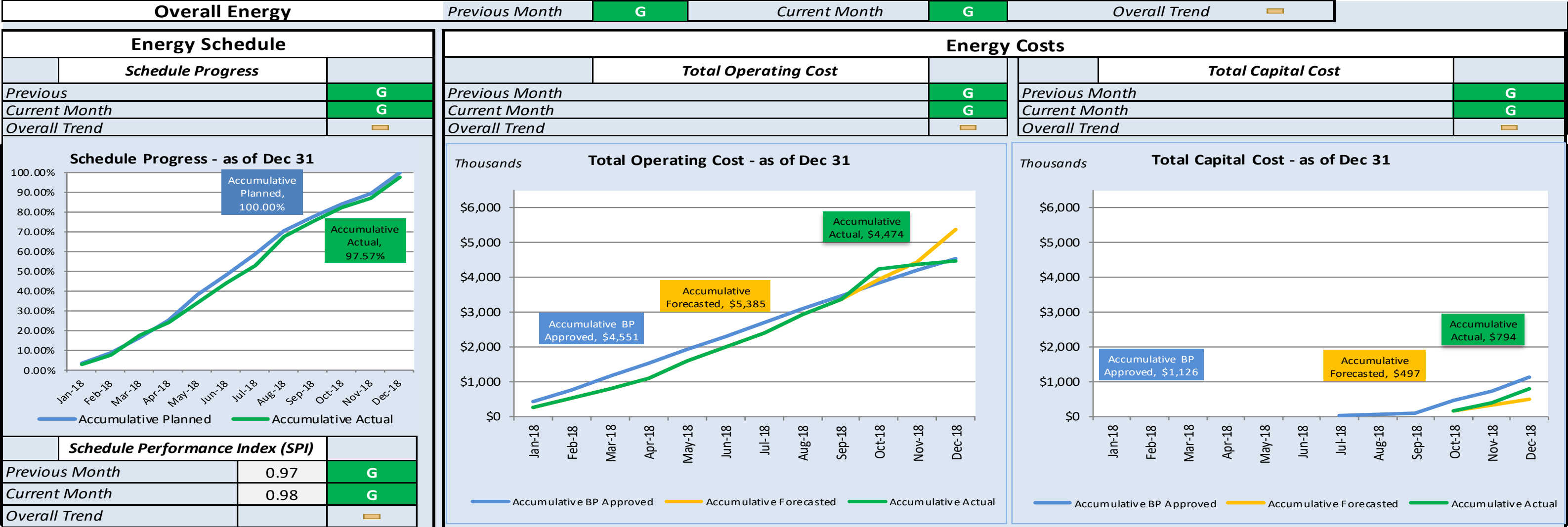
1.ICA HLD available for internal review in Dec 2018.



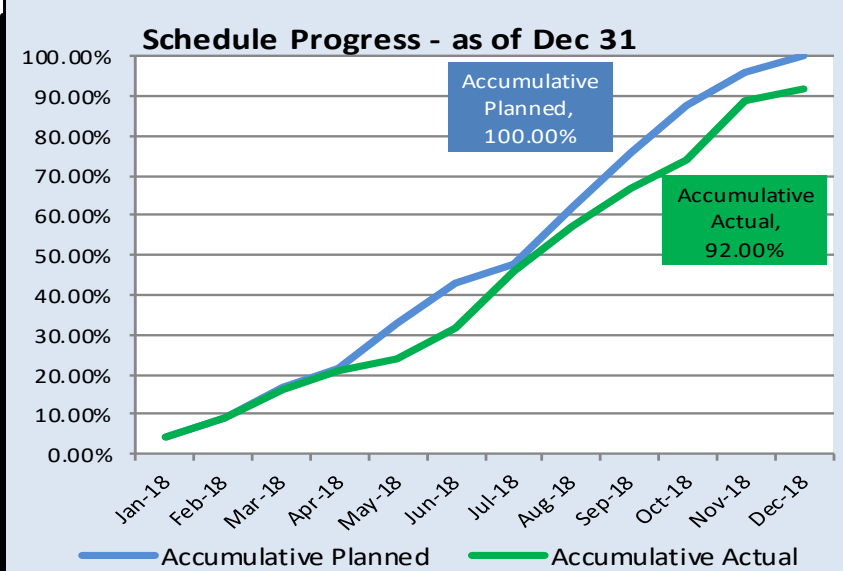
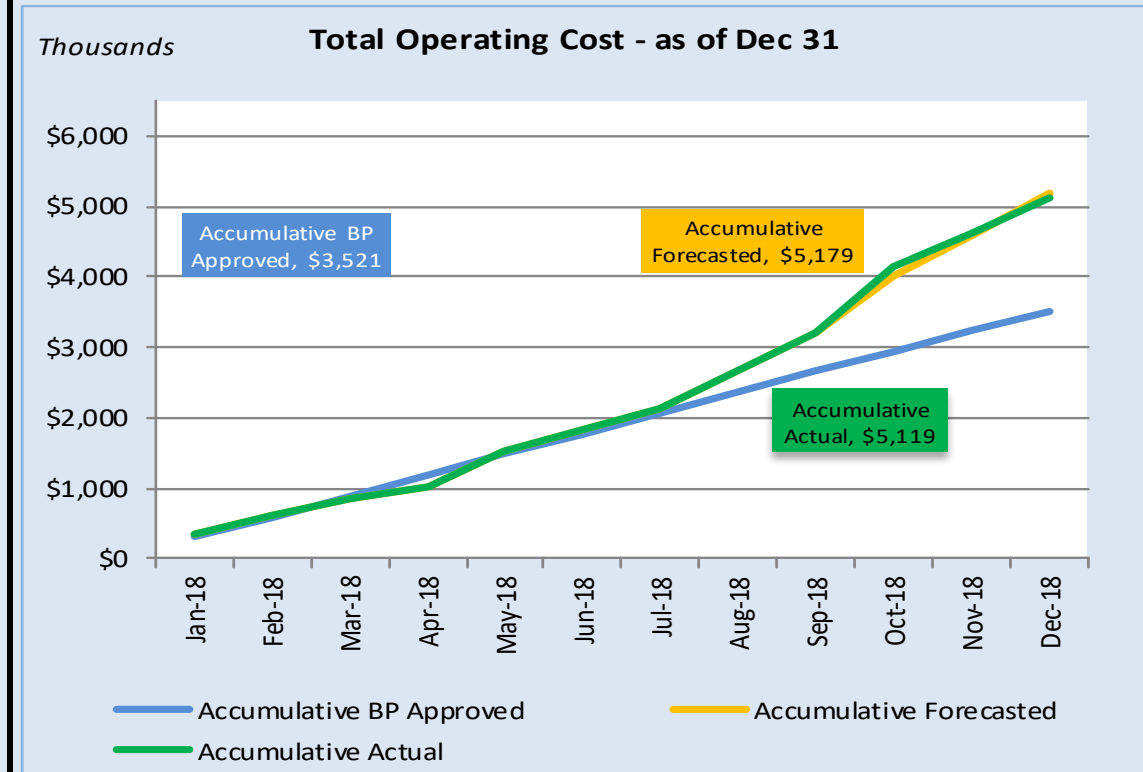
# MARKET RENEWAL PROGRAM DASHBOARD




# ENERGY WORK STREAM



# CAPACITY WORK STREAM

Overall Capacity			Previous Month	G	Current Month	G	Overall Trend	
Capacity Schedule			Capacity Costs					
Schedule Progress			Total Operating Cost				No capital cost breakout for Capacity Workstream in 2018	
Previous		G	Previous Month			G		
Current Month		G	Current Month			G		
Overall Trend			Overall Trend					
<div><div>Schedule Progress - as of Dec 31</div></div>			<div><div>Thousands</div><div>Total Operating Cost - as of Dec 31</div></div>					
Schedule Performance Index (SPI)								
Previous Month		0.92	G					
Current Month		0.92	G					
Overall Trend								
Engagement & Issues			Key Design Decisions			Cost Performance Index(CPI)		
<ul style="list-style-type: none"><li>High Level Design (HLD):<ul style="list-style-type: none"><li>Preparations are underway for the release of the Incremental Capacity Auction (ICA) HLD at the end of March.</li><li>A stakeholder meeting is scheduled for Mar. 6 to address feedback from the October stakeholder meetings and to set the stage for the upcoming release of the ICA HLD and the feedback period.</li><li>An ICA Communications Plan has been developed.</li></ul></li><li>New messaging has been developed for the pre-ICA period which focuses on the interim capacity mechanism as opposed to the 2023 capacity gap – please see the key messages section of the MRP dashboard.</li><li>An MRP briefing has been held with the Minister’s Office, and engagement continues with the ministries to identify risks for siting/approval for ICA facilities.</li></ul>			<ul style="list-style-type: none"><li>With key preliminary decisions in the ICA provided to stakeholders in Oct., the stakeholder focus will now shift to the details. For example, with multi-year commitments available for new resources, stakeholders are requesting that the definition of “new” apply to uprates, DR, and refurbishments.</li></ul>			Previous Month		
						1.17		
						G		
						Current Month		
						1.09		
						G		
						Overall Trend		
						Milestones		
						<ul style="list-style-type: none"><li>The ICA High Level Design document was circulated for internal review on Dec. 18.</li></ul>		
Legend								
Status	Overall	SPI	Schedule Progress	CPI	Operating & Capital Costs			
G	All constraints green	> 0.90	< 10% contingency	> 0.90	< 10% contingency			
Y	One constraint yellow	0.70 – 0.90	10% - 100% contingency	0.80 – 0.90	10% - 100% contingency			
R	More than one constraint yellow, or any constraint red	< 0.70	>100% contingency	< 0.80	>100% contingency			

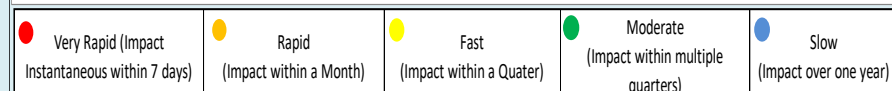
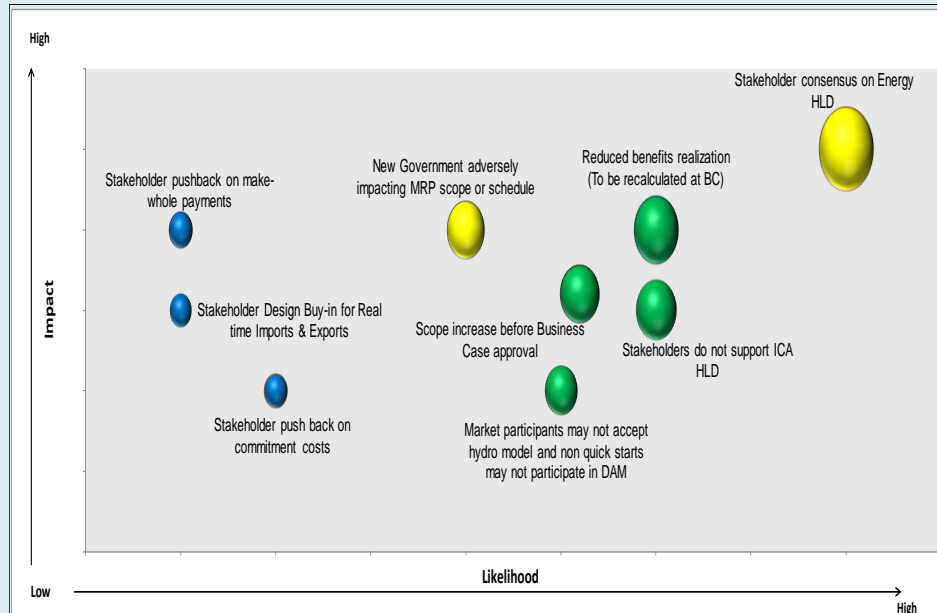
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Connecting Today.  
Powering Tomorrow.

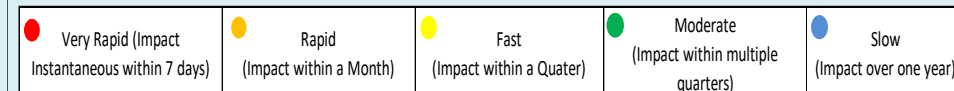
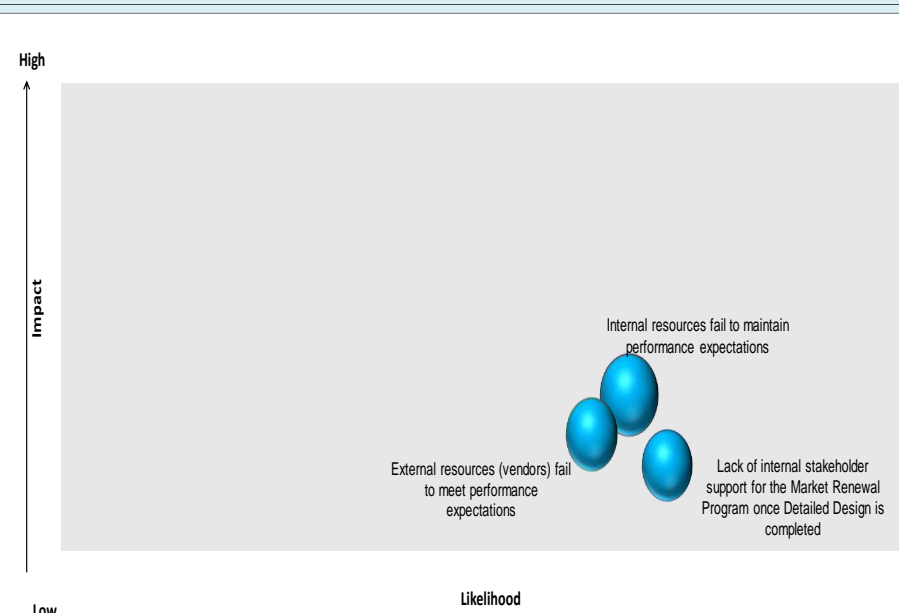
# RISK MANAGEMENT

## Risk Velocity by Category

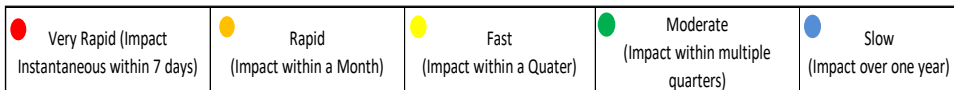
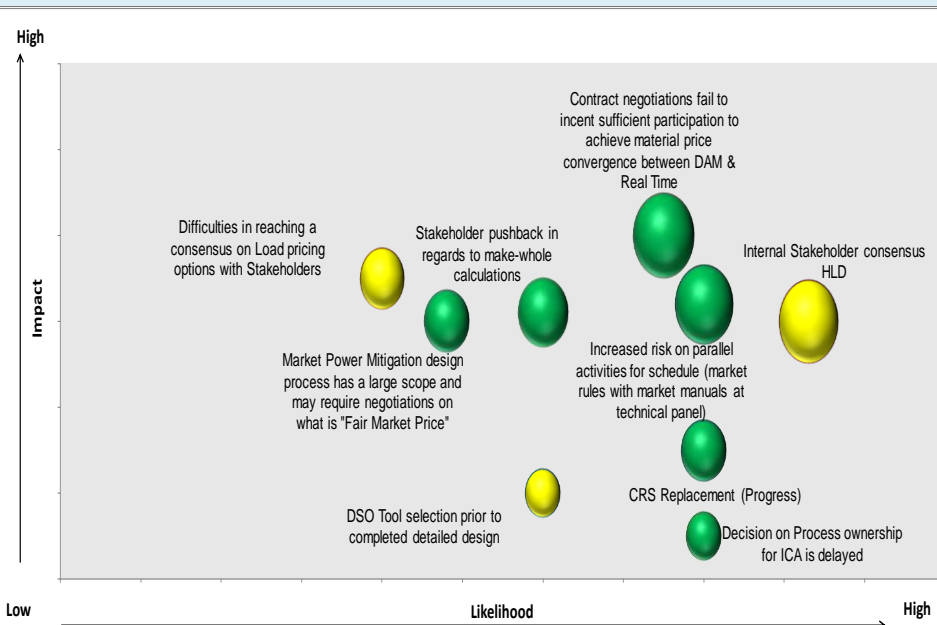
### External



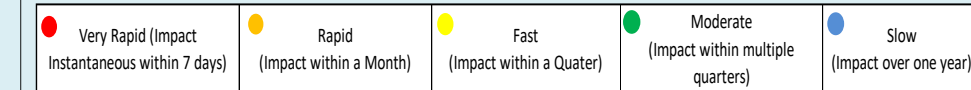
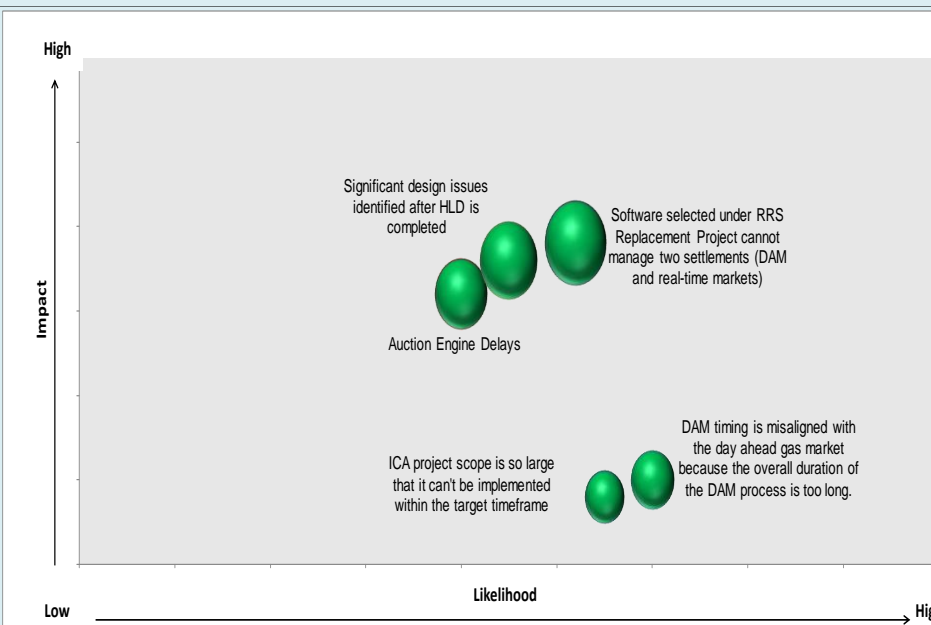
### Resource



### Process



### Technology & Integration



## Highlighted Risks

### Program

- MRP resourcing needs continue to grow as detailed design begins. Finding skilled employees for temporary roles continues to be challenging and responses to recent job postings have been poor.
- MRP project timelines rely heavily on many other parts of the business aligning their own project deliverables with those of the MRP.
- Maintaining and continuing to build stakeholder support as the new government develops policy priorities has renewed the focus on engagement and communications with the addition of new outreach and awareness initiatives.

### Energy

- None

### Capacity

- A potential capacity gap has been identified in Ontario for 2023. The current project schedule expects the ICA to be ready in 2023 to meet capacity needs in 2024. This has led to some concerns externally about how the potential gap will be addressed.

# MARKET RENEWAL PROGRAM DASHBOARD

## Key Summary

### Schedule

The program remains behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.94, up from previous month of 0.92. This is still in the Green category, but a value of 0.89 or below triggers a switch into Yellow. The primary drivers are challenges in attracting and securing sufficient quantities of qualified candidates to fill budgeted roles. For year end 2018, they are 18 vacancies that we are targeting to fill.

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.32, down from previous month of 1.34. This is in the Green category, and corresponds to the SPI being less than 1. The program has not been able to spend the budgeted money on the consultants and resources as planned in the schedule, resulting in an overall underspend against the forecast.

### Risk

We continue to work with KPMG and Enterprise Risk team on the refinement of existing IESO Risk Assessment Framework, which includes: 1) Gap analysis between the Project Risk Framework (PRF) and Enterprise Risk Management (ERM), and 2) identifying leading best practices into integrate with PRF and ERM. MRP Risk Training (2hr introduction) was completed on Sept 14.

### Upcoming Milestones

The High Level Design document for the Single Schedule Market (SSM) within the Energy work stream is on track to be published by September 30, 2018 for stakeholder review and feedback.

Schedule, Cost, Risk, and Milestone data as of August 31, 2018.

Prepared: September 18, 2018

MRESC Meeting: September 21, 2018

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**Program: MRP-Market Renewal Program**

Monthly Cost Report for MRESC  
September 18, 2018

Document Ref. No.: PRG\_MCR08

**Period: Month Ending  
31-Aug-18**

<b><u>Program Cost Summary:</u></b>				
	<b>2017 <sup>(1)</sup></b>		<b>2018 <sup>(1)</sup></b>	
	<b>Operating</b>	<b>Capital</b>	<b>Operating</b>	<b>Capital</b>
<i>Business Plan Approved Costs</i>	9,247		12,700	4,000
<i>Contingency</i>	2,760			
<b>Business Plan with Contingency</b>	<b>12,007</b>		<b>12,700</b>	<b>4,000</b>
<i>Forecast</i>	7,972			
<i>2018 Forecast Baseline (end Q1-2018)</i>			17,700	550
<i>2018 Forecast Rolling <sup>(2)</sup></i>			14,803	1,044
<i>Contingency <sup>(3)</sup></i>				90
<b>Forecast with Contingency</b>	<b>7,972</b>		<b>14,803</b>	<b>1,134</b>
<i>Variance (2018 Rolling vs Baseline Forecast)</i>			-2,897	584
<i>Actual Costs <sup>(4)</sup></i>	7,902	201	8,629	599
<i>Contingency</i>				
<b>Actual with Contingency</b>	<b>7,902</b>	<b>201</b>	<b>8,629</b>	<b>599</b>

Notes:

(1) Report in thousands (000's).

(2) Includes Q4 Capital Forecast for SSM.

(3) No contingency for 2018 operating forecasted costs.

(4) Actual costs for 2018 are YTD.



## MRP - Operating Financial Summary - 31-Aug-18

The Business Plan Approved Costs for MRP have been divided into the four projects: SSM, DAM, ERUC, and ICA, as well as a general account for tracking costs associated with Program related activities. Each project has been forecasted to reflect the cost expectations for 2018. The actual costs will be tracked against the 2018 baseline forecast.

### Variance Summary:

MRP spend for August is 8% below the baseline forecast.

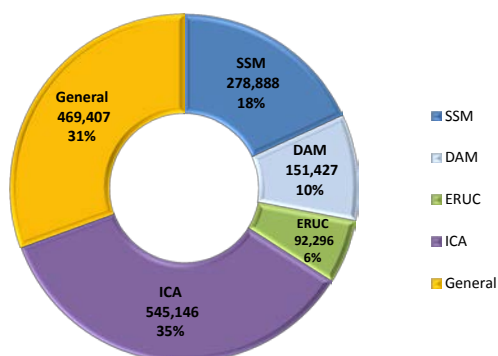
### Forecasting Update:

Forecast has increased as the Design and Integration leads are expected to join the program in October. Contract negotiations are in progress.

## Overview of MRP Monthly Costs: 31-Aug-18

MRP Operating Costs													
Monthly								Year to Date					
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 31-Aug-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$233,224	\$255,579	\$278,888	\$23,309	9%	Above Forecast		\$1,837,044	\$1,428,120	\$1,220,511	(\$207,609)	(15%)	Below Forecast
DAM	\$72,845	\$102,500	\$151,427	\$48,927	48%	Above Forecast		\$625,887	\$875,642	\$1,035,456	\$159,814	18%	Above Forecast
ERUC	\$72,845	\$102,050	\$92,296	(\$9,754)	(10%)	Below Forecast		\$625,887	\$748,563	\$666,723	(\$81,840)	(11%)	Below Forecast
ICA	\$300,649	\$565,792	\$545,146	(\$20,647)	(4%)	Below Forecast		\$2,376,430	\$3,098,342	\$2,678,296	(\$420,046)	(14%)	Below Forecast
General	\$392,847	\$646,625	\$469,407	(\$177,218)	(27%)	Below Forecast		\$3,114,029	\$3,682,077	\$3,028,297	(\$653,780)	(18%)	Below Forecast
<b>Total Program</b>	<b>\$1,072,411</b>	<b>\$1,672,546</b>	<b>\$1,537,163</b>	<b>(\$135,383)</b>	<b>(8%)</b>	<b>Below Forecast</b>		<b>\$8,579,277</b>	<b>\$9,832,744</b>	<b>\$8,629,283</b>	<b>(\$1,203,460)</b>	<b>(12%)</b>	<b>Below Forecast</b>

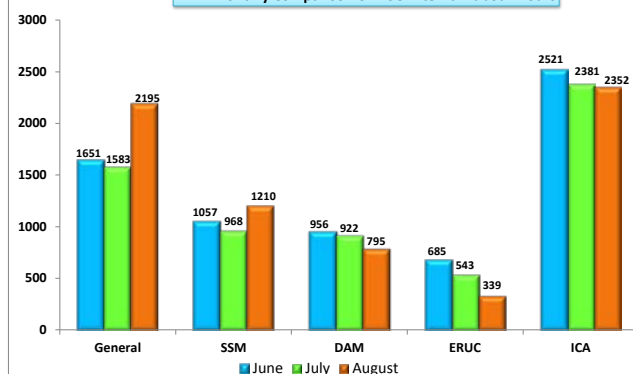
Monthly Actual Costs by Project



### Notes:-

The above graph reflects MRP actual cost allocation per projects and percentage. The cost split for August shows a relatively even split and the two work streams and the General account - Capacity 35%, Energy 34% & General 31%.

MRP Monthly Comparison of IESO Internal Labour Hours

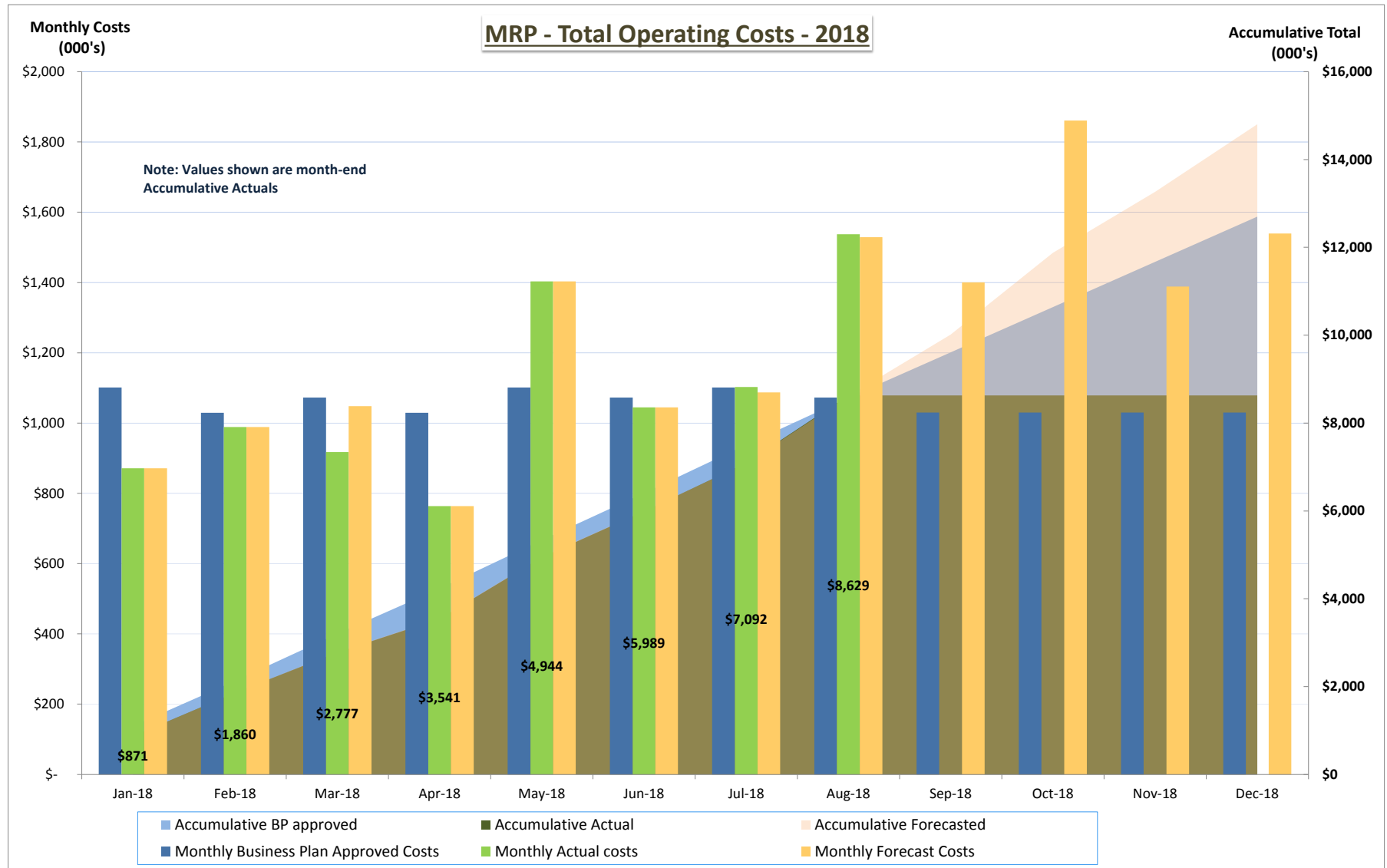


Notes:- August's hours remained flat cumulatively with a slight month over month increase in General as staff returned from vacations taken in July.

MRP Monthly Comparison - 2018 Operating Actuals

Project	Jan	Feb	Mar	Apr	May	June	July	August	YTD
SSM	69,769	88,106	83,920	151,393	221,896	177,132	149,407	278,888	1,220,511
DAM	105,936	112,941	92,211	87,294	182,775	141,457	161,415	151,427	1,035,456
ERUC	72,792	80,158	97,317	55,286	86,282	84,620	97,973	92,296	666,723
ICA	358,104	272,219	234,502	167,162	494,585	293,182	313,397	545,146	2,678,296
General	264,630	435,358	409,454	302,561	417,810	348,220	380,858	469,407	3,028,297
<b>Total</b>	<b>871,230</b>	<b>988,782</b>	<b>917,404</b>	<b>763,695</b>	<b>1,403,349</b>	<b>1,044,611</b>	<b>1,103,050</b>	<b>1,537,163</b>	<b>8,629,283</b>





Notes:- As illustrated above August actuals are higher than the monthly Business Plan approved but on par with the rolling forecast.

## MRP - Capital Financial Summary - 31-Aug-18

The capital costs approved under the 2018 Approved Business Plan is to capture the costs of detailed design work projected for 2018 as well as the costs for relocating the MRP team to our UMR location.

### Variance Summary:

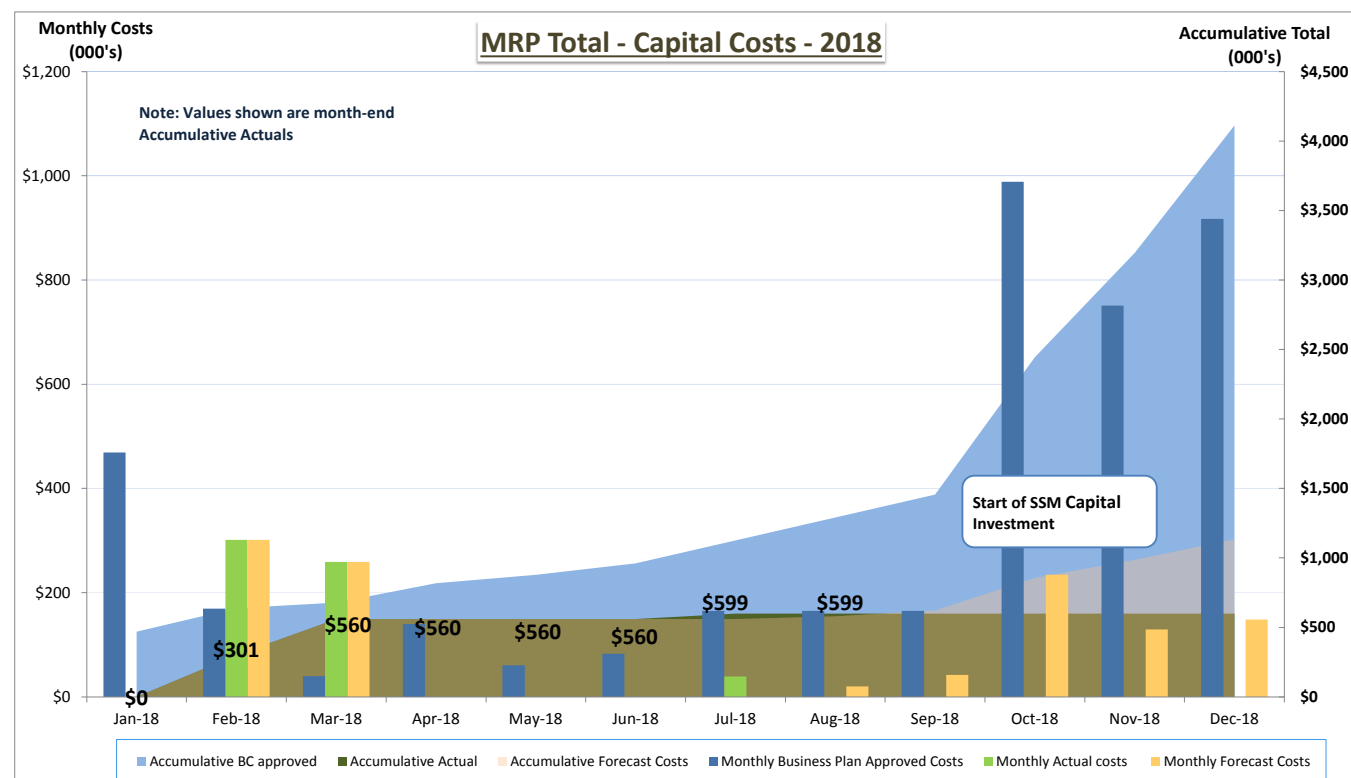
Capital Spend YTD reflects delay in delivery of AV Equipment for the meeting rooms at UMR. A quote of \$42,000 for monitors was received in August with the costs expected to materialize in September.

### Areas for Improvements:

The capital budget spend planned for Q4 2018 is now expected to be delayed to Q1 2019, as High Level Designs completion (DAM & ERUC) are now being projected for the end of Q4, ICA Q2 2019 and not in Q3 2018 as originally projected. SSM is on schedule to be completed by end of Q3 2018, and some costs may be able to be capitalized in Q4 2018.

## Overview of MRP Monthly Costs: 31-Aug-18

MRP Capital Costs								Year to Date					
Monthly													
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 31-Aug-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
General - UMR	\$165,000	\$0	\$0	\$0			Capital Spend YTD reflects delay in delivery of AV Equipment for the meeting rooms at UMR.	\$1,290,760	\$771,297	\$599,167	(\$172,130)	(22%)	Below Forecast
Total Program	\$165,000	\$0	\$0	\$0				\$1,290,760	\$771,297	\$599,167	(\$172,130)	(22%)	Below Forecast



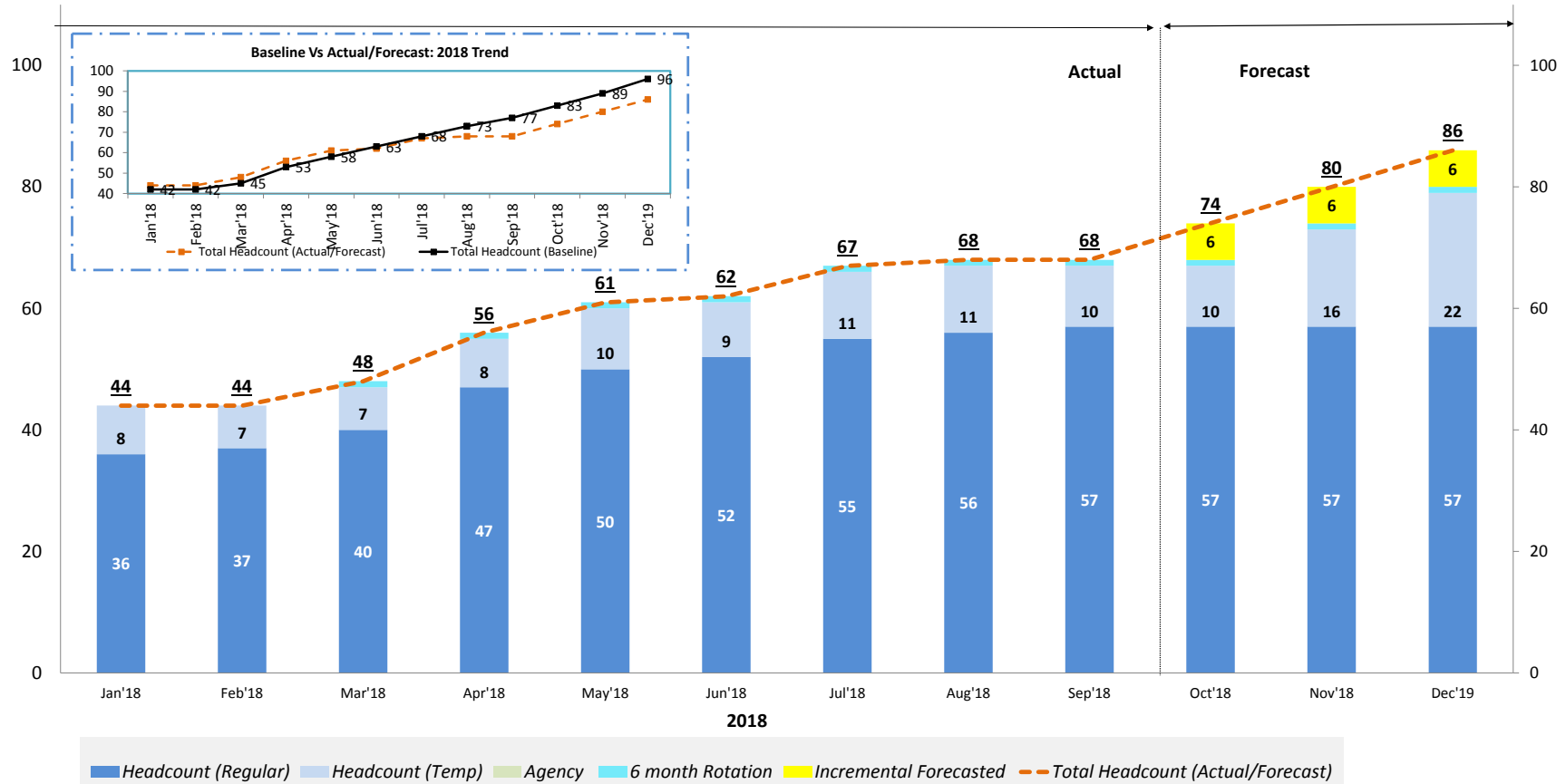
Notes:- The graph reflects the initial expectations stated in the approved business plan with capital budget of \$4M and with detailed designs beginning in Q4 2018. UMR Relocation is the only capital spend to date. Capital spend forecast has been revised to reflect the lag in detail designs, as well as the SSM Detailed Design work projected to be funded as capital expenditure in Q4.



Monthly Headcount

**MRP Monthly and Accumulative Headcount - 2018**

Accumulative Headcount



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Program: MRP-Market Renewal Program

Project: Total MRP Program

Monthly Schedule Report for MRESC  
August 31, 2018

Document Ref. No.: MRP\_MSR06\_18-08-31  
(MSR ~ 06)

Project Commencement Reporting Date: Jan 1, 2018  
Project Completion Reporting Date: Dec 31, 2018

Reporting Range Period	From		To
	January 1, 2018	<<<<<< >>>>>>	August 31, 2018

For Week ending	August 31, 2018
-----------------	-----------------

Reporting Date	September 7, 2018
----------------	-------------------

Program Schedule Status

Schedule Baseline	Cumulative Planned %	Cumulative Actual %	Variation %	Schedule Variance <sup>(1)</sup>
	69%	64%	4%	Under Threshold

Month End Project Performance Status

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	\$12,171,681	\$11,412,823	0.94	Behind Schedule

Cost Performance	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	\$8,643,612	\$11,412,823	1.32	Under Budget

**Legend for Status:**

(1). Threshold upper limit: assumption is -10%, If variation exceed (-10%) threshold limit schedule to be revised  
(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule" or if SPI=1 "On Schedule"  
(3). Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"  
Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.



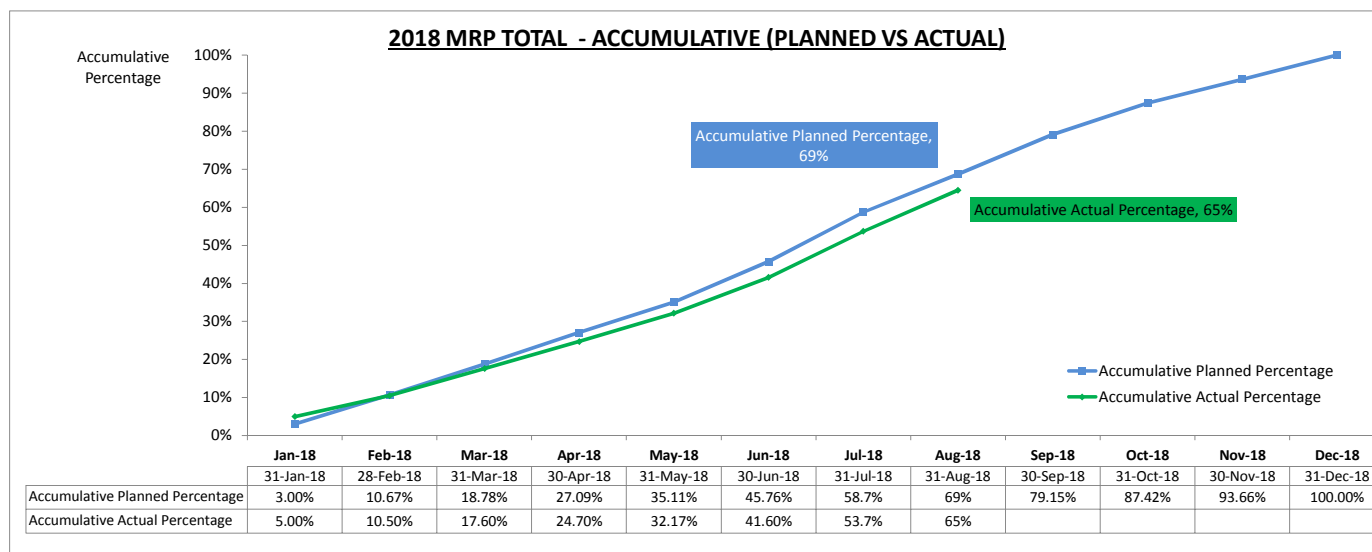
# MARKET RENEWAL PROGRAM

## Project Progress and Performance Indicators

Monthly Status as of: **31-Aug-18**

PROGRESS INDICATORS								
MRP	2018 Total Forecast at Completion (BAC) <sup>(1)</sup>	2018 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed
SSM	\$2,943,020	\$1,220,511	16.6%	01-Jan-18	31-Dec-18	67.34%	62.33%	10.4%
DAM	\$1,285,642	\$1,035,456	7.3%	01-Jan-18	31-Dec-18	71.12%	69.91%	5.1%
ERUC	\$1,156,763	\$666,723	6.5%	01-Jan-18	31-Dec-18	72.63%	70.57%	4.6%
ICA	\$6,069,638	\$2,678,296	34.3%	01-Jan-18	31-Dec-18	61.81%	57.53%	19.7%
GENERAL	\$6,244,937	\$3,042,626	35.3%	01-Jan-18	31-Dec-18	75.00%	70.00%	24.7%
<b>MRP Total</b>	<b>\$17,700,000</b>	<b>\$8,643,612</b>	<b>100%</b>			<b>68.8%</b>		<b>64.5%</b>

PERFORMANCE INDICATORS			
Earned Value (EV) (BAC X Monthly Scheduled Actual Progress)	Planned Value (PV) (BAC X Monthly Scheduled Planned %)	CPI (EV/AC)	SPI (EV/PV)
\$1,834,384	\$1,981,830	1.50	0.93
\$898,792	\$914,349	0.87	0.98
\$816,328	\$840,157	1.22	0.97
\$3,491,863	\$3,751,643	1.30	0.93
\$4,371,456	\$4,683,703	1.44	0.93
<b>\$11,412,823</b>	<b>\$12,171,681</b>	<b>1.32</b>	<b>0.94</b>



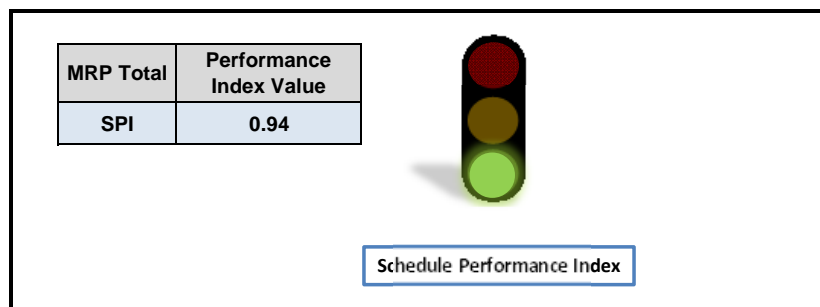
Notes  
 (1) 2018 Forecast values and not Budget values will be used.  
 (2) Overall Schedule Variance for MRP Total is -4%



## MARKET RENEWAL PROGRAM

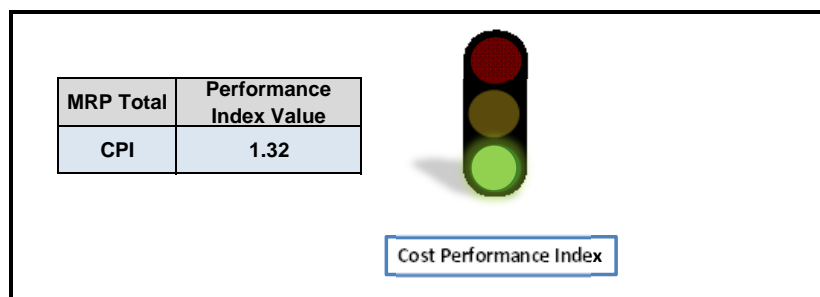
### Project Progress and Performance Indicators

Monthly Performance Status: 31-Aug-18



Threshold limits

Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9



Three Month Rolling Performance Comparison 31-Aug-18



Note: For MRP Total Performance indices over the last three months, SPI remained steady at around 0.94 and CPI continued to trend upwards to remain under budget.

#### PMI Definitions:

##### CPI (Cost Performance Index)

The cost performance index (CPI) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

##### SPI (Schedule Performance Index)

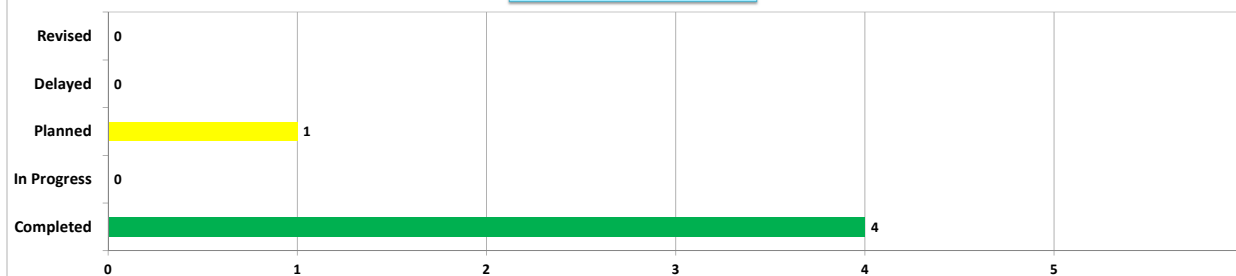
Schedule performance index (SPI) is a ratio of the earned value (EV) to the planned value (PV).  $SPI = EV \div PV$ . If the SPI is less than one, it indicates that the project is potentially behind schedule to-date whereas an SPI greater than one, indicates the project is running ahead of schedule

### SSM-Project Milestone Status

31-Aug-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision- Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	Next Session Sept. 20
5	High Level Design Document (External Publication)	28-Sep-18	28-Sep-18			Planned	

### Milestone (2017-2018)



### SSM-Design Elements Progress

31-Aug-18

S.No	Design Element	Completion Stages	Stages Completed	STAGES									
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 2: Energy Ref Price	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
2	DE 1: Energy Congestion Price	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
3	DE 3: Energy Ref Price loss Component	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
4	DE 6: Supplier Pricing	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
5	DE 7: Operating Reserve Reference Price	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
6	DE 8: Reserve Congestion Price	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
7	DE 11: Multi-interval optimization (MIO) pricing run and ramp rate Multiplier	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
8	DE4: Pre or Post interval pricing	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
9	DE 5: Intertie Congestion Price	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
10	DE 9: Resolving Constraint Violations	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
11	DE 12: Pricing setting Eligibility for Resources	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
12	DE 10: Out of Market Operator Actions	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
13	DE 18: Make Whole Payment	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
14	DE 19: Uplift Recovery	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
15	DE 13: Mitigation Process	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
16	DE 14: Timing of Application	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
17	DE:15 Reference Levels	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
18	DE 16: Pricing for Loads	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			
19	DE 17: Congestion Rents & Loss residuals	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress			

#### Notes:

1. Review 1 : Includes internal review of all design elements in three different parts
2. Review 2 : Internal review of HLD (all three parts combined)
3. Review 3 : Publish HLD to external stakeholders
4. Review 4: Incorporate comments on HLD from external Stakeholders
5. Review 5: HLD Approval





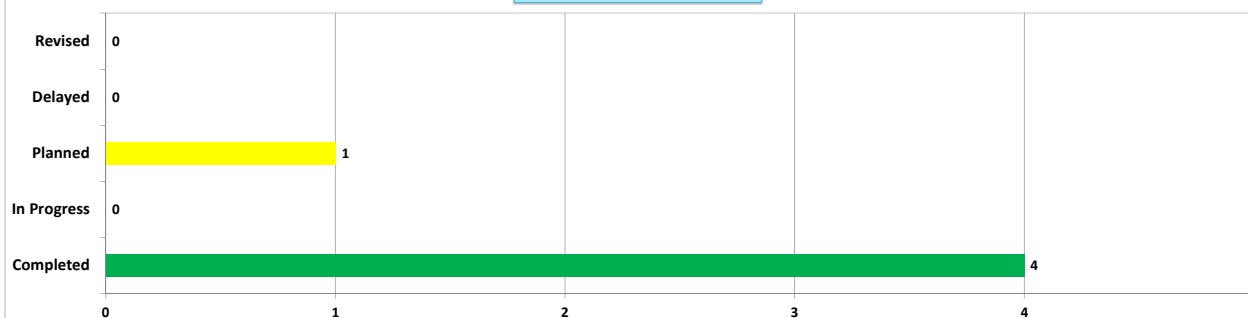
DAM-Executive Overview

**DAM-Project Milestone Status**

31-Aug-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	19-Jul-18	29-Mar-18	19-Jul-18	Completed	Next Session Sept. 20
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	

**Milestone (2017-2018)**



**DAM-Design Elements Progress**

31-Aug-18

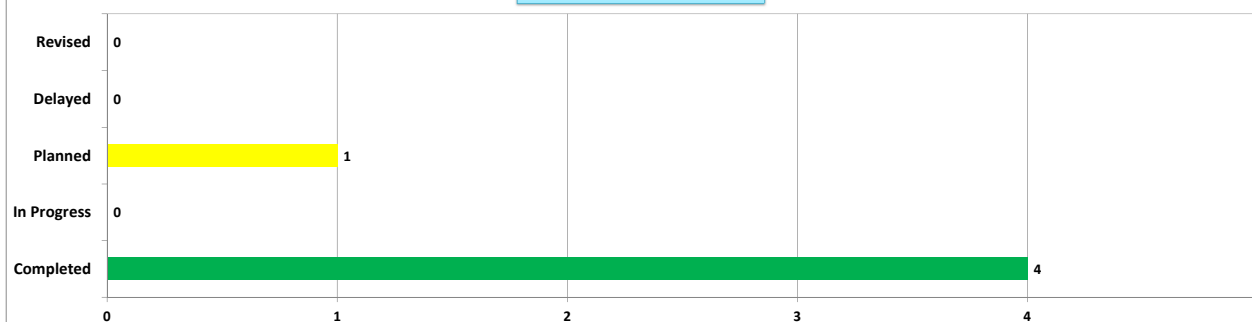
S.No	Design Element	Completion Stages	Stages Completed	STAGES									
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	Internal		External	
										7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Reference Quantity (formerly must-offer Requirements)	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
2	DE 4: Reliability Input Parameters	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
3	DE 5: Virtual Transactions	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
4	DE 6: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
5	DE 7: Optimization Energy Limited Resources	10	4	Completed	Completed	Completed	Completed	In Progress					
6	DE 8: Submission and Posting Deadlines	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
7	DE 9: Initiation of Operational Commitments	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
8	DE10: Market Power Mitigation	10	4	Completed	Completed	Completed	Completed	In Progress					
9	DE 11: Price Setting Eligibility	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
10	DE 12: Reporting Obligations	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
11	DE 13: Two Settlement for Load	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
12	DE 14: Two Settlement for Supply	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
13	DE 15: Make Whole Payments	10	4	Completed	Completed	Completed	Completed	In Progress					
14	DE 16: Uplift Recovery	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
15	DE 17: Financial Transmission Rights	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
16	DE 18: Market System Failures	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
17	DE 2: Load Participation	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
18	DE 3: Supply Participation: Variable Generation	10	6	Completed	Completed	Completed	Completed	Completed	Completed				

**ERUC-Project Milestone Status**

31-Aug-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	Next Session Sept. 20
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	

**Milestone (2017-2018)**



**ERUC-Design Elements Progress**

31-Aug-18

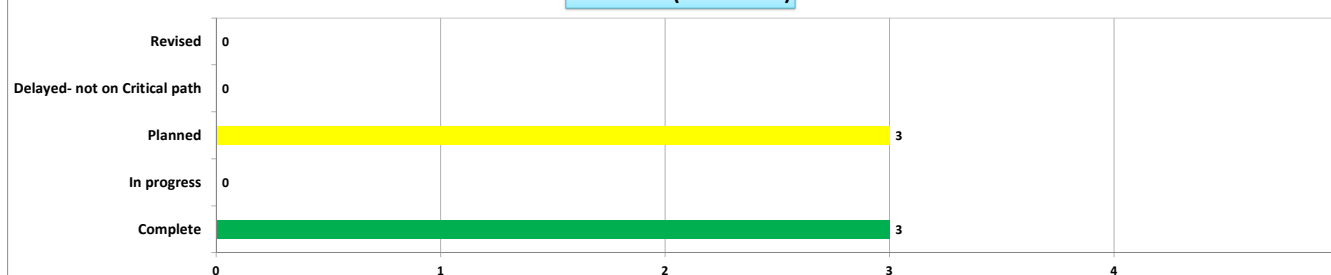
S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	Internal			External
										7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
2	DE 2: Look Ahead Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
3	DE 3: Timing and Frequency of Run	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
4	DE 4: Time Step	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
5	DE 5: Intertie Transactions	10	4	Completed	Completed	Completed	Completed	In Progress					
6	DE 6: Must Offer Requirements	10	5	Completed	Completed	Completed	Completed	Completed					
7	DE 7: Eligibility for Make-whole	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
8	DE 8: Market Participant Data	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
9	DE 9: Commitment Cost Mitigation	10	5	Completed	Completed	Completed	Completed	Completed					
10	DE10: Offer Changes	10	5	Completed	Completed	Completed	Completed	Completed					
11	DE 11: Binding Start-up Instruction and Operational Constraint	10	5	Completed	Completed	Completed	Completed	Completed					
12	DE 12: Calculation of Make Whole Payment	10	4	Completed	Completed	Completed	Completed	In Progress					
13	DE 13: Failure Charge	10	4	Completed	Completed	Completed	Completed	In Progress					

**ICA-Project Milestone Status**

31-Aug-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	18-May-17	20-Jul-17	18-May-17	20-Jul-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations-Phase 2	16-Aug-17	17-Apr-18	16-Aug-17	14-Jun-18	Completed	
4	RFP for Auction Engine	19-Dec-18	4-Dec-19			Planned	RFP Completed, RFP Process reforecasted based on ICA priorities, Scheduled for Q1 2019
5	Stakeholder Engagement- Design Decision Presented	12-Sep-18	19-Oct-18			Planned	Next Session Oct. 18 & 19
6	Publish HLD internally for review 1	19-Dec-18	1-Feb-19			Planned	

**Milestone (2017-2018)**



**ICA-Design Elements Progress**

31-Aug-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft HLD Templates	6. Draft HLD Contents	7. Review 1	8. Review 2	9. Review 3	10. Review 4
1	DE 1: Participation Requirement	10	3	Completed	Completed	Completed	In Progress						
2	DE 2: Resource Eligibility	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
3	DE 3: Qualified Capacity	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
4	DE 4: Market Power Mitigation	10	3	Completed	Completed	Completed	In Progress						
5	DE 5: Length of Forward Period	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
6	DE 6: Commitment Period	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
7	DE 7: Multi-Year Commitments	10	3	Completed	Completed	Completed	In Progress						
8	DE 8: Locational Considerations	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
9	DE 9: Slope of Demand Curve	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
10	DE 10: Target Capacity	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
11	DE 11: Min/Max Capacity Limits	10	3	Completed	Completed	Completed	In Progress						
12	DE 12: Net Cost of New Entry	10	3	Completed	Completed	Completed	In Progress						
13	DE 13: Max Auction Clearing Price	10	3	Completed	Completed	Completed	In Progress						
14	DE 14: Rebalancing Auctions	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
15	DE 15: Resource Obligations (within forward period)	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
16	DE 16: Non-Performance Implications (within forward period)	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
17	DE 17: Resource Performance Obligations	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
18	DE 18: Performance Assessment	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
19	DE 19: Cost Recovery	10	3	Completed	Completed	Completed	In Progress						
20	DE 20: Auction Mechanics	10	3	Completed	Completed	Completed	In Progress						
21	DE 21: Settlements	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				

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**Program: MRP-Market Renewal Program**

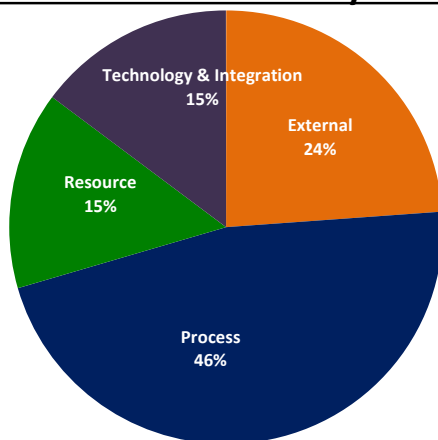
**Monthly Risk Report For MRESC**

*August 31, 2018*

Document Ref. No.: PRG\_MRR03

**Period: Month Ending: 31-Aug-18**

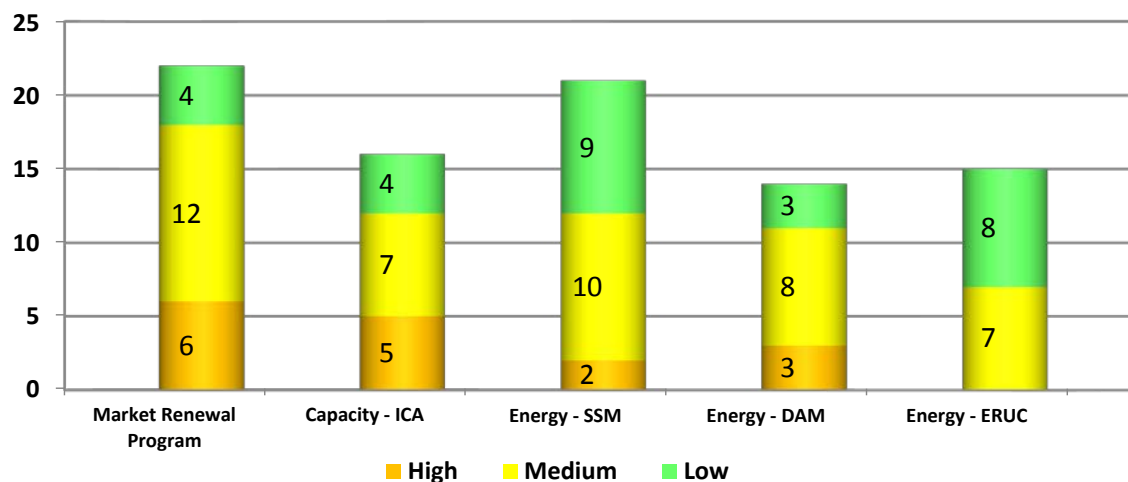
**MRP - Total Residual Risk By Category**



All program and project risks have been categorised into four categories, with the largest category of risks being categories as "Process" risks.

**MRP - Total Residual Risk By Project**

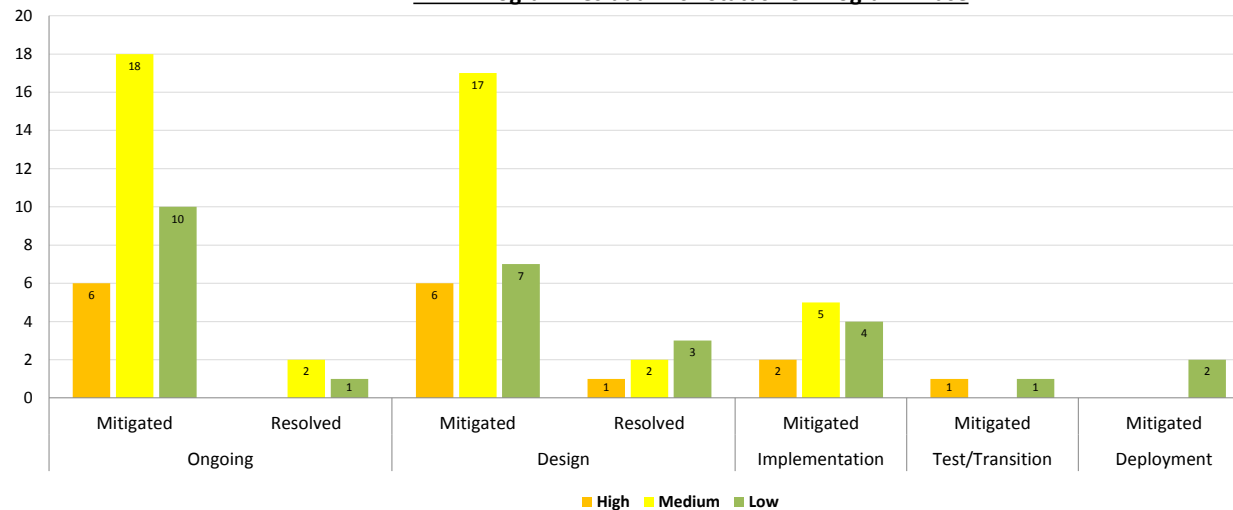
Number of Risks



All MRP Risks have been divided into the four projects: SSM, DAM, ERUC and ICA, and Program risks. Each identified risk was assessed with the project team, and the document the risk response tasks that will be implemented proactively to prevent or at least reduce the level of the identified risk. In total we currently have 88 Risks

**MRP RISK SUMMARY - MRESC as of August 31, 2018**
**TOP MRP CONTROLABLE RISKS**

Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R022	Market Renewal Program	Design	Process	Business Case approvals - approval delays could cause release of Capital expenditure for Detail work on Energy and Capacity work streams	High	Finance has proposed capitalisation expenditure rules that are referencing that the preliminary project stage is completed, and Management, with the relevant authority, implicitly or explicitly authorizes and commits to funding a computer software project. Instead of an approved business case.	Resolved	↓
ICA_R024	Capacity - ICA	Design	Process	Lack of clarity regarding division of accountability between ICA Team and line of business	High	Engage internal stakeholders regarding roles and responsibilities of line staff vs. the ICA Team	Mitigated	↓
DAM_R012	Energy - DAM	Design	Process	Contracted or rate-regulated participants may be resistive to DAM participation rules and two-settlement outcomes	High	Develop a strategic engagements plan with the SE team	Mitigated	▬
DAM_R007	Energy - DAM	Design	Process	Contract negotiations fail to incent sufficient participation to achieve material price convergence between DAM & Real Time	High	Ensure full participants engaging/soliciting on design features to ensure design will incentivize (price certainty, overall lower cost, etc...)	Mitigated	▬
MRP_R005	Market Renewal Program	Ongoing	Process	Difficulty reaching agreement with internal stakeholders (Change Management).	High	Operations and IT Leads assigned to reduce the impact as they are representing their respective areas. Director's Forum is setup to facilitate these escalations. Final step for resolution is the MRESC	Mitigated	↓
MRP_R003	Market Renewal Program	Ongoing	Process	Critical interdependencies with other projects (e.g. CRS Replacement)	High	MRP Representation on dependent projects and representation on PSC. MRP leads and BA's to work with dependant projects to identify any impacts during design phase.	Mitigated	▬
ICA_R019	Capacity - ICA	Test/Transition	Process	The need for parallel activities on timeline (e.g. market rules with market manuals at technical panel)	High	Start activities as early as possible.	Mitigated	▬
MRP_R015	Market Renewal Program	Implementation	Technology & Integration	Design decisions need to be revisited due to technical limitations	High	IT Lead and resources have been introduced early on the program to reduce the likelihood and impact of this occurring. Furthermore software vendors will be part of the HLD.	Mitigated	▬

**Number of Risks**
**MRP- Program Residual Risk Status Per Program Phase**

**Updates on KPMG Risk Assessment**

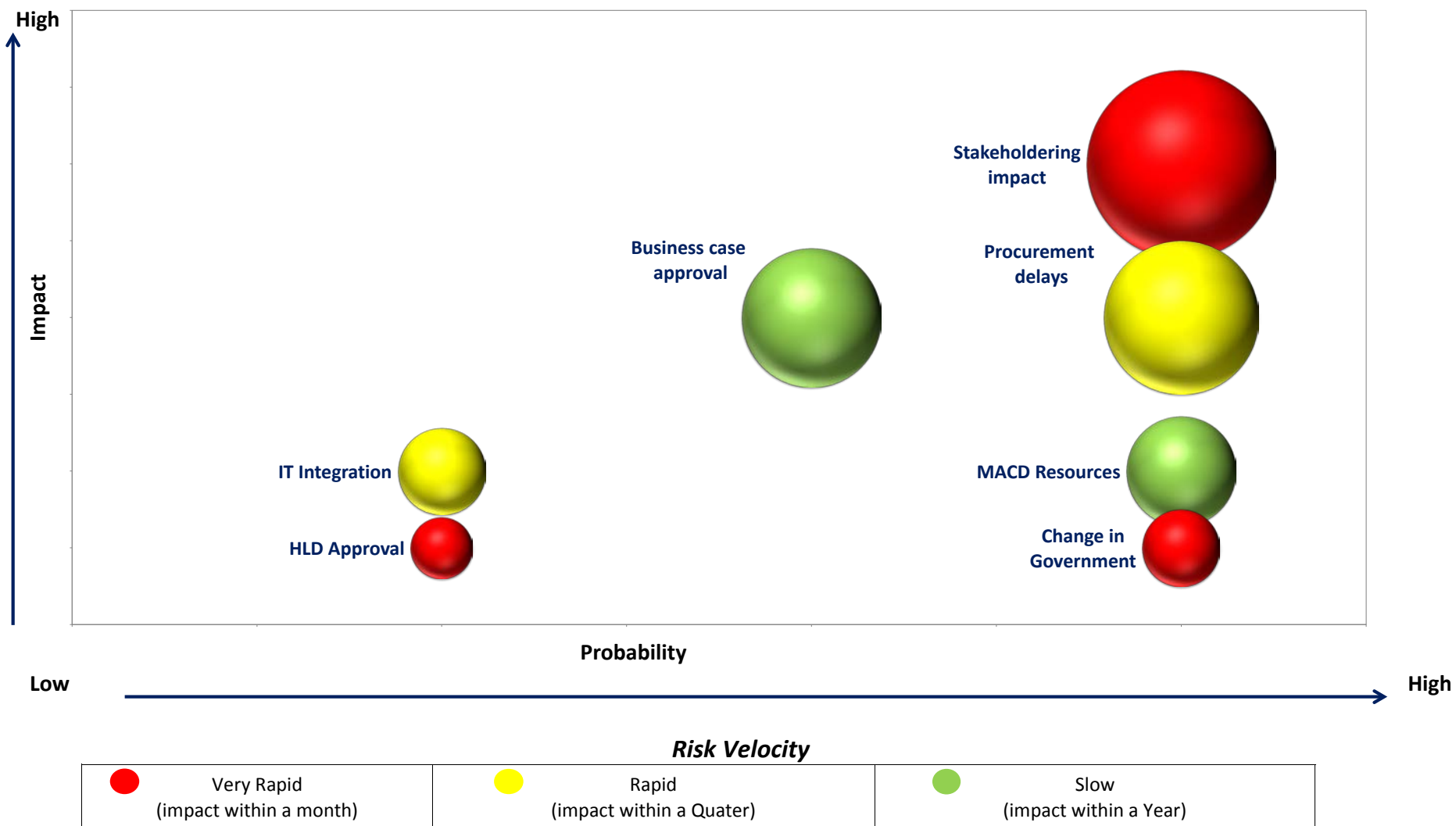
\*Completed MRP Training on Sept 14, with 3 two-hours sessions. This includes session one for MRP Leadership, session two for Capacity and session three for Energy workstream.

\* Continue with gaps on ERM and PRM models

\* Adding risk velocity as measurement for risk report

MRP RISK SUMMARY - MRESC as of August 31, 2018

**DRAFT - Under development**



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# MARKET RENEWAL PROGRAM DASHBOARD

## Key Summary

### Schedule

The program is overall slightly behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.93. This is in the Green category. Within the program, the Energy work stream SPI is 0.97 (Green) which is consistent from last month, while the Capacity work stream SPI is 0.88 (Yellow) which is slip from the previous month.

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.27. This is in the Green category, and corresponds to the SPI being less than 1. The program has not been able to spend the budgeted money on the consultants and resources as planned in the schedule, resulting in an overall underspend against the forecast. The Energy work stream CPI is 1.20 while the Capacity work stream CPI is 1.26.

### Risk

Risk consultant, KPMG, is working jointly with the MRP and Enterprise Risk teams. They are currently working on the refinement of existing IESO Risk Assessment Framework, which includes: 1) Gap analysis between the Project Risk Framework (PRF) and Enterprise Risk Management (ERM), and 2) identifying leading best practices into integrate with PRF and ERM.

### Upcoming Milestones

The High Level Design document for the Single Schedule Market (SSM) within the Energy work stream was published on September 27, 2018 for stakeholder review and feedback. The remaining high level designs for the Energy work stream are scheduled for December 2018.

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**Program: MRP-Market Renewal Program**

Monthly Cost Report for MRESC  
October 17, 2018

Document Ref. No.: PRG\_MCR09

**Period: Month Ending  
30-Sep-18**

<b><u>Program Cost Summary:</u></b>				
	<b>2017 <sup>(1)</sup></b>		<b>2018 <sup>(1)</sup></b>	
	<b>Operating</b>	<b>Capital</b>	<b>Operating</b>	<b>Capital</b>
<i>Business Plan Approved Costs</i>	9,247		12,700	4,000
<i>Contingency</i>	2,760			
<b>Business Plan with Contingency</b>	<b>12,007</b>		<b>12,700</b>	<b>4,000</b>
<i>Forecast</i>	7,972			
<i>2018 Forecast Baseline (end Q1-2018)</i>			17,700	550
<i>2018 Forecast Rolling <sup>(2)</sup></i>			14,465	1,077
<i>Contingency <sup>(3)</sup></i>				90
<b>Forecast with Contingency</b>	<b>7,972</b>		<b>14,465</b>	<b>1,167</b>
<i>Variance (2018 Rolling vs Baseline Forecast)</i>			-3,235	617
<i>Actual Costs <sup>(4)</sup></i>	7,902	201	10,281	641
<i>Contingency</i>				
<b>Actual with Contingency</b>	<b>7,902</b>	<b>201</b>	<b>10,281</b>	<b>641</b>

Notes:

(1) Report in thousands (000's).

(2) Includes Q4 Capital Forecast for SSM.

(3) No contingency for 2018 operating forecasted costs.

(4) Actual costs for 2018 are YTD.

## MRP - Operating Financial Summary - 30-Sep-18

The Business Plan Approved Costs for MRP have been divided into the four projects: SSM, DAM, ERUC, and ICA, as well as a general account for tracking costs associated with Program related activities. Each project has been forecasted to reflect the cost expectations for 2018. The actual costs will be tracked against the 2018 baseline forecast.

### Variance Summary:

MRP spend for September is 17% below the baseline forecast.

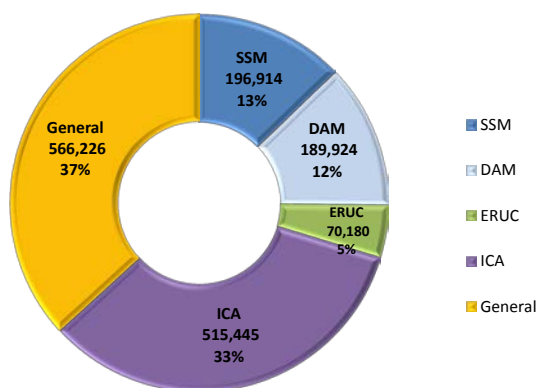
### Forecasting Update:

The rolling forecast has increased as Brattle's projections through year end were revised to include additional scope.

## Overview of MRP Monthly Costs: 30-Sep-18

MRP Operating Costs													
Monthly								Year to Date					
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 30-Sep-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$219,849	\$309,204	\$196,914	(\$112,290)	(36%)	Below Forecast		\$2,056,893	\$1,737,324	\$1,418,179	(\$319,145)	(18%)	Below Forecast
DAM	\$72,845	\$102,500	\$189,924	\$87,424	85%	Above Forecast		\$698,732	\$978,142	\$1,220,347	\$242,205	25%	Above Forecast
ERUC	\$72,845	\$102,050	\$70,180	(\$31,870)	(31%)	Below Forecast		\$698,732	\$850,613	\$733,585	(\$117,028)	(14%)	Below Forecast
ICA	\$286,172	\$656,000	\$515,445	(\$140,555)	(21%)	Below Forecast		\$2,662,602	\$3,529,342	\$3,203,742	(\$325,600)	(9%)	Below Forecast
General	\$378,472	\$692,833	\$566,226	(\$126,608)	(18%)	Below Forecast		\$3,492,502	\$4,374,911	\$3,705,523	(\$669,388)	(15%)	Below Forecast
<b>Total Program</b>	<b>\$1,030,184</b>	<b>\$1,862,587</b>	<b>\$1,538,689</b>	<b>(\$323,899)</b>	<b>(17%)</b>	<b>Below Forecast</b>		<b>\$9,609,461</b>	<b>\$11,470,331</b>	<b>\$10,281,376</b>	<b>(\$1,188,955)</b>	<b>(10%)</b>	<b>Below Forecast</b>

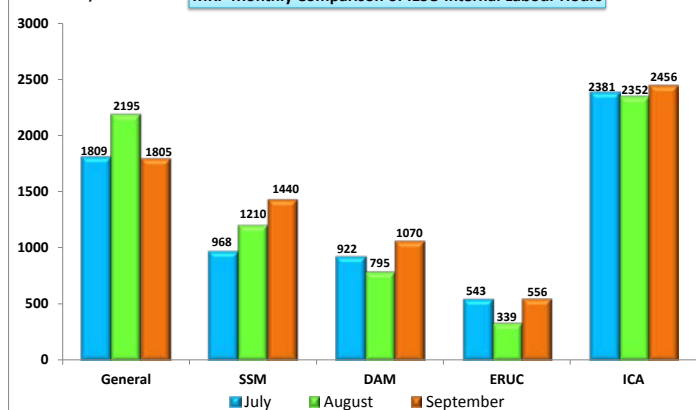
Monthly Actual Costs by Project



### Notes:-

The above graph reflects MRP actual cost allocation per projects and percentage. The cost split for September shows a relatively even split between the two work streams and the General account - Capacity 33%, Energy 30% & General 37%.

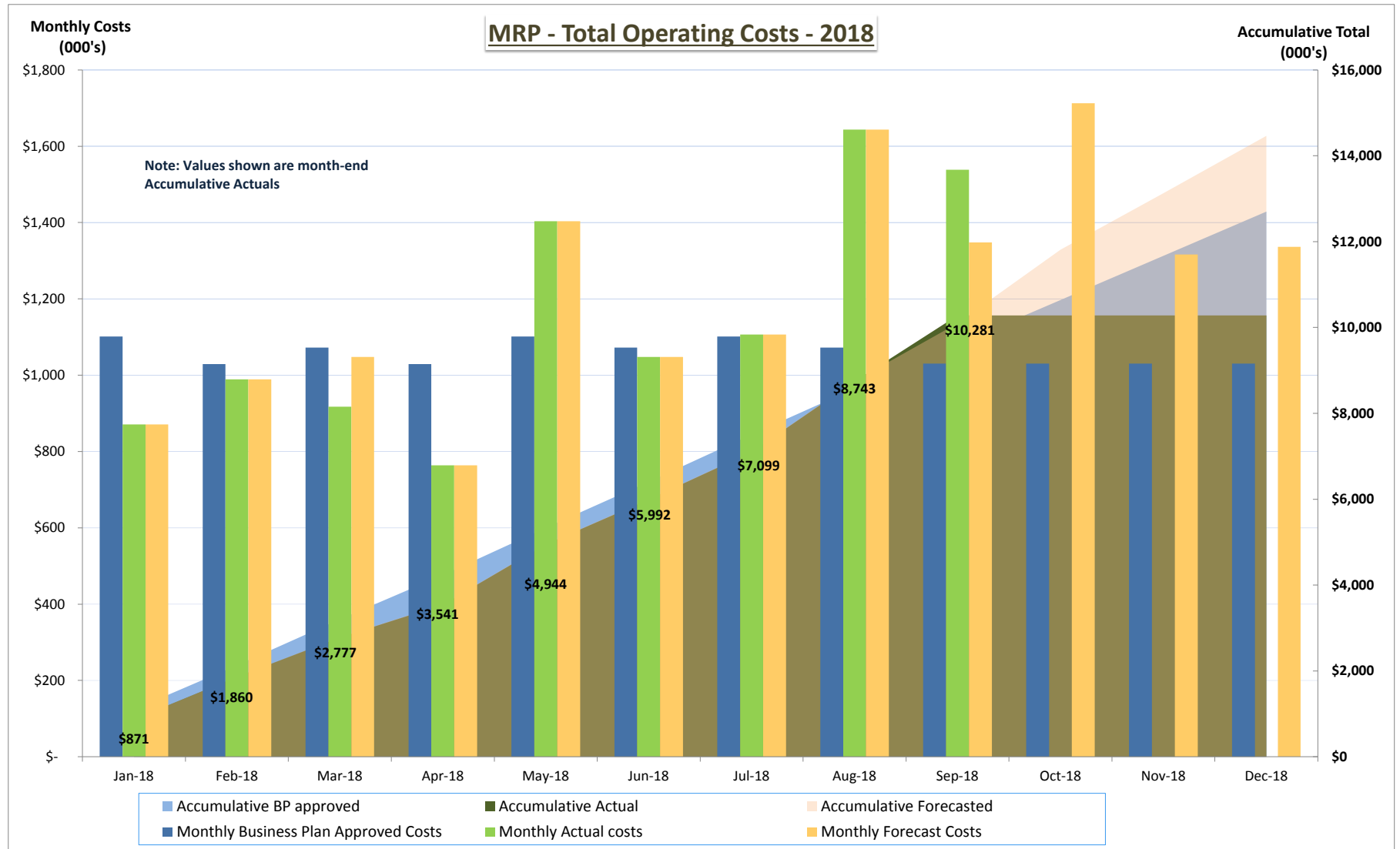
MRP Monthly Comparison of IESO Internal Labour Hours



### Notes:-

September's hours showed an increase in the Energy workstreams as the team prepared for the publishing of the SSM High Level Design document. DAM and ERUC also showed increased hours as team members returned from August vacations. ICA and General aligned with expectations.

MRP Monthly Comparison - 2018 Operating Actuals										
Project	Jan	Feb	Mar	Apr	May	June	July	August	September	YTD
SSM	69,769	88,106	83,920	151,393	221,896	177,132	149,407	279,642	196,914	1,418,179
DAM	105,936	112,941	92,211	87,294	182,775	141,457	161,415	146,394	189,924	1,220,347
ERUC	72,792	80,158	97,317	55,286	86,282	84,620	94,655	92,296	70,180	733,585
ICA	358,104	272,219	234,502	167,162	494,585	296,332	320,248	545,146	515,445	3,203,742
General	264,630	435,358	409,454	302,561	417,810	348,220	380,858	580,407	566,226	3,705,523
<b>Total</b>	<b>871,230</b>	<b>988,782</b>	<b>917,404</b>	<b>763,695</b>	<b>1,403,349</b>	<b>1,047,761</b>	<b>1,106,583</b>	<b>1,643,884</b>	<b>1,538,689</b>	<b>10,281,376</b>



Notes:-

## MRP - Capital Financial Summary - 30-Sep-18

The capital costs approved under the 2018 Approved Business Plan is to capture the costs of detailed design work projected for 2018 as well as the costs for relocating the MRP team to our UMR location.

### Variance Summary:

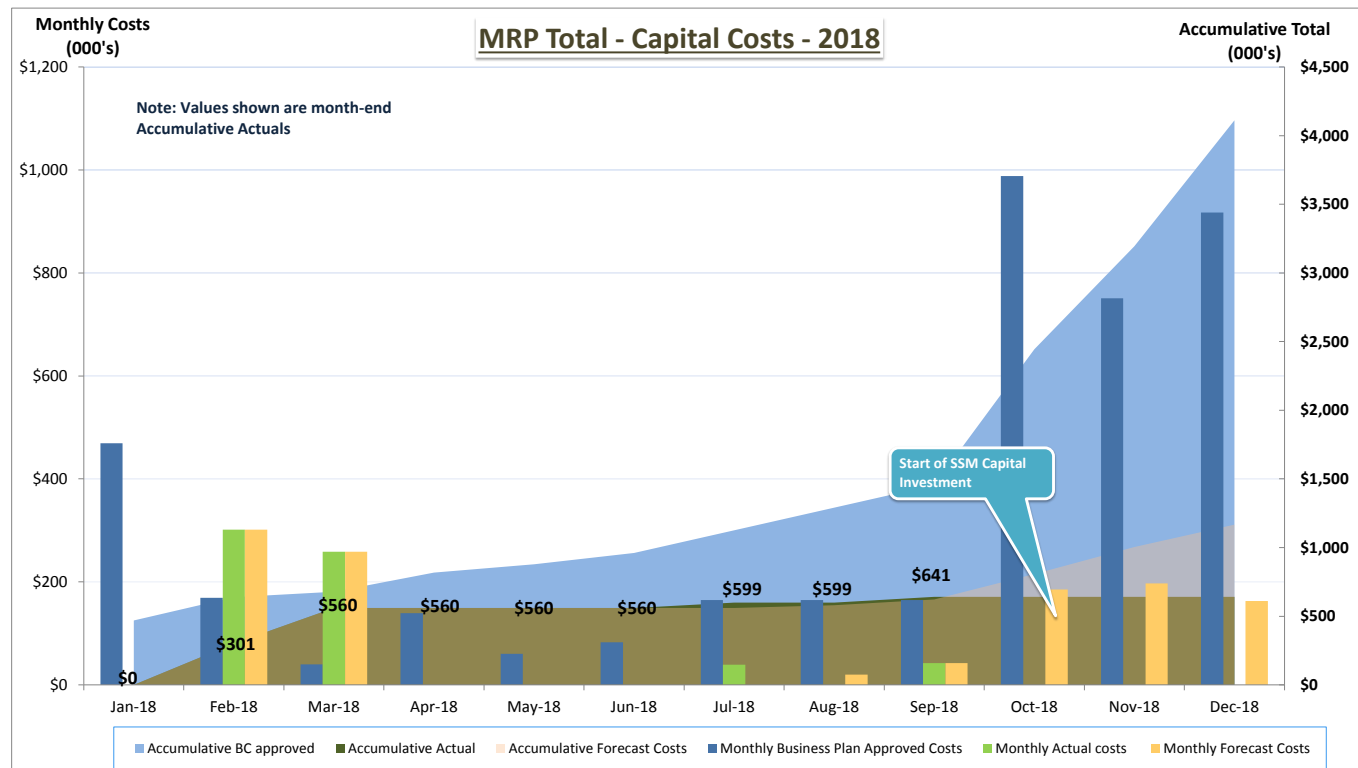
Capital Spend YTD reflects delay in delivery of AV Equipment for the meeting rooms at UMR. As expected the monitors for the AV equipment were delivered in September, with video conferencing equipment expected to be installed by the end of October.

### Notable Improvements:

SSM has published it's High Level Design document and we expect some costs to be capitalized starting October 2018 as SSM enters the Detailed Design phase. High Level Designs for DAM & ERUC are projected to be completed by the end of Q4 while ICA's completion is projected for Q2 2019.

## Overview of MRP Monthly Costs: 30-Sep-18

MRP Capital Costs								Year to Date					
Monthly													
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 30-Sep-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
General - UMR			\$42,000	\$42,000			Capital Spend YTD reflects delay in delivery of AV Equipment for the meeting rooms at UMR.	\$1,455,760	\$771,297	\$641,167	(\$130,130)	(17%)	Below Forecast
<b>Total Program</b>			<b>\$42,000</b>	<b>\$42,000</b>				<b>\$1,455,760</b>	<b>\$771,297</b>	<b>\$641,167</b>	<b>(\$130,130)</b>	<b>(17%)</b>	<b>Below Forecast</b>



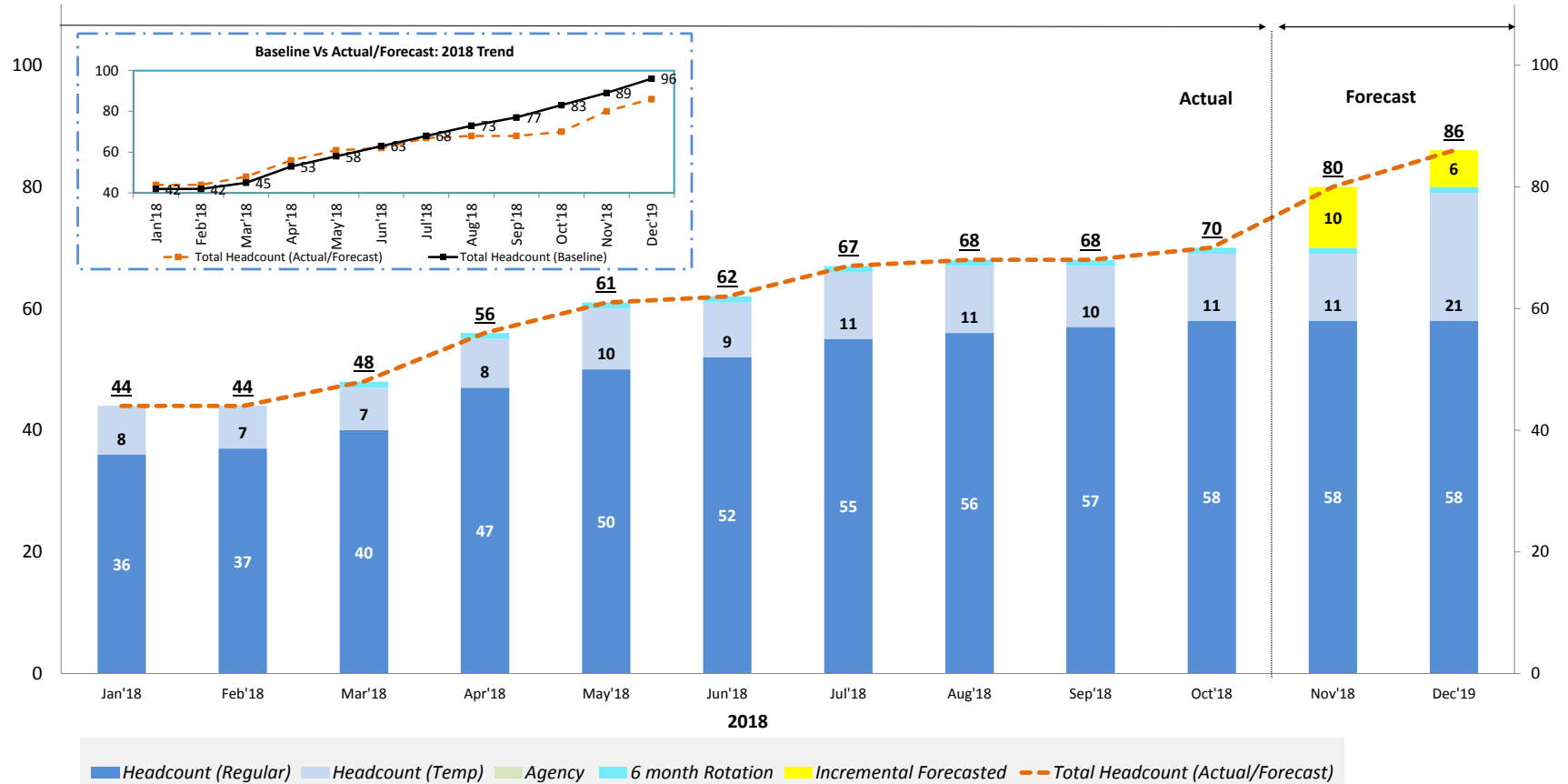
Notes:- The graph reflects the initial expectations stated in the approved business plan with capital budget of \$4M and with detailed designs beginning in Q4 2018. UMR Relocation is the only capital spend to date. Capital spend forecast has been revised to reflect the lag in detail designs, as well as the SSM Detailed Design work projected to be funded as capital expenditure in Q4.



Monthly Headcount

**MRP Monthly and Accumulative Headcount - 2018**

Accumulative Headcount



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**Program: MRP-Market Renewal Program**

**Project: Total MRP Program**

**Monthly Schedule Report for MRESC**  
**September 30, 2018**

**Document Ref. No.: MRP\_MSR07\_18-09-30**  
**(MSR ~ 07)**

**Project Commencement Reporting Date: Jan 1, 2018**  
**Project Completion Reporting Date: Dec 31, 2018**

Reporting Range Period	From		To
	January 1, 2018	<<<<< >>>>>	September 30, 2018

For Week ending	September 30, 2018
-----------------	--------------------

Reporting Date	October 7, 2018
----------------	-----------------

**Program Schedule Status**

Schedule Baseline	Cumulative Planned %	Cumulative Actual %	Variation %	Schedule Variance <sup>(1)</sup>
	79.2%	73.6%	5.5%	Under Threshold

**Month End Project Performance Status**

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	\$14,010,320	\$13,035,268	0.93	Behind Schedule

Cost Performance	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	\$10,281,376	\$13,035,268	1.27	Under Budget

**Legend for Status:**

(1). Threshold upper limit: assumption is -10%, If variation exceed (-10%) threshold limit schedule to be revised

(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule" or if SPI=1 "On Schedule"

(3). Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"

Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.

Prepared by: MRP Project Scheduler



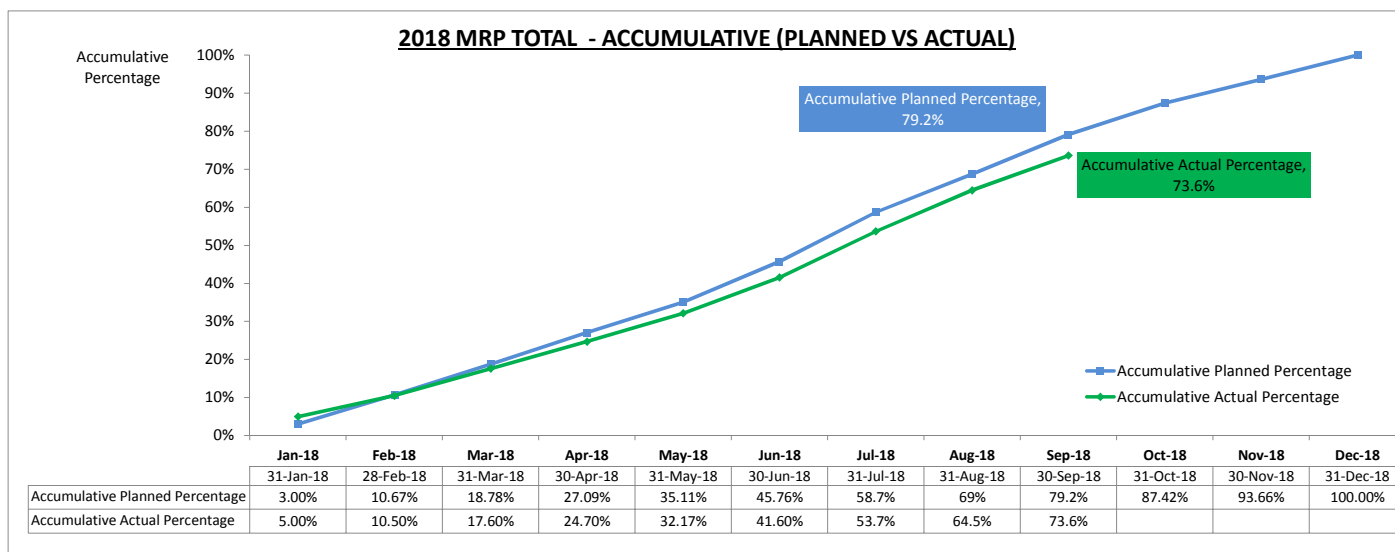
# MARKET RENEWAL PROGRAM

## Project Progress and Performance Indicators

Monthly Status as of: **30-Sep-18**

PROGRESS INDICATORS								
MRP	2018 Total Forecast at Completion (BAC) <sup>(1)</sup>	2018 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed
SSM	\$2,943,020	\$1,418,179	16.6%	01-Jan-18	31-Dec-18	73.74%	72.09%	12.0%
DAM	\$1,285,642	\$1,220,347	7.3%	01-Jan-18	31-Dec-18	79.16%	76.63%	5.6%
ERUC	\$1,156,763	\$733,585	6.5%	01-Jan-18	31-Dec-18	79.49%	76.95%	5.0%
ICA	\$6,069,638	\$3,203,742	34.3%	01-Jan-18	31-Dec-18	75.70%	66.60%	22.8%
GENERAL	\$6,244,937	\$3,705,523	35.3%	01-Jan-18	31-Dec-18	85.00%	80.00%	28.2%
<b>MRP Total</b>	<b>\$17,700,000</b>	<b>\$10,281,376</b>	<b>100%</b>			<b>79.2%</b>		<b>73.6%</b>

PERFORMANCE INDICATORS			
Earned Value (EV) (BAC X Monthly Scheduled Actual Progress)	Planned Value (PV) (BAC X Monthly Scheduled Planned %)	CPI (EV/AC)	SPI (EV/PV)
\$2,121,623	\$2,170,183	1.50	0.98
\$985,187	\$1,017,714	0.81	0.97
\$890,129	\$919,511	1.21	0.97
\$4,042,379	\$4,594,716	1.26	0.88
\$4,995,950	\$5,308,196	1.35	0.94
<b>\$13,035,268</b>	<b>\$14,010,320</b>	<b>1.27</b>	<b>0.93</b>

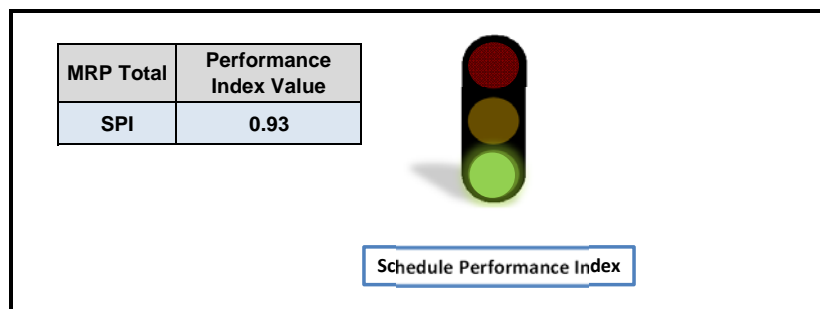


Notes (1) 2018 Forecast values and not Budget values will be used.  
(2) Overall Schedule Variance for MRP Total is -5.5%

# MARKET RENEWAL PROGRAM

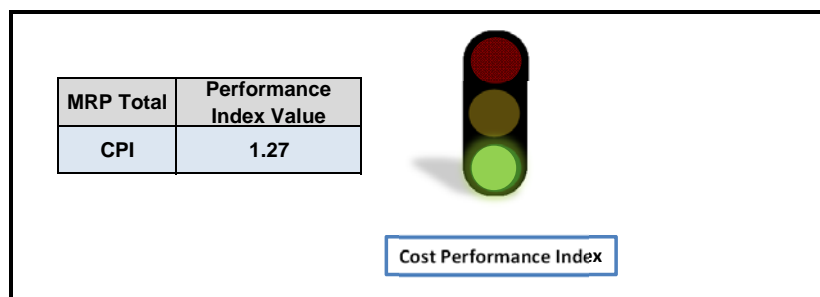
## Project Progress and Performance Indicators

Monthly Performance Status: 30-Sep-18

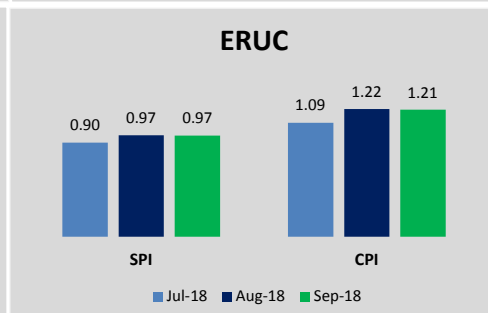
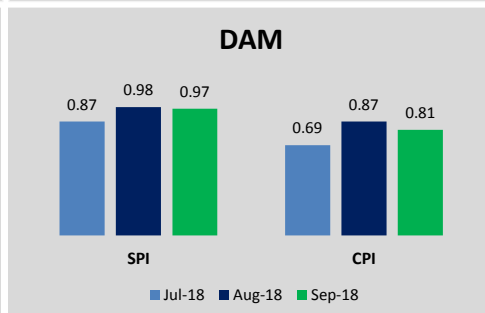
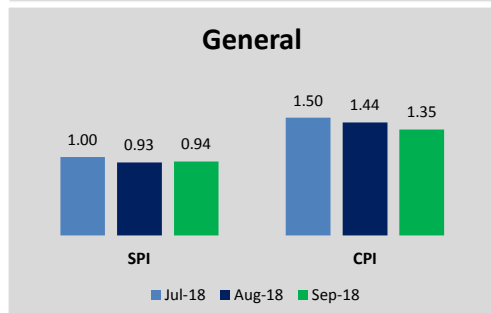
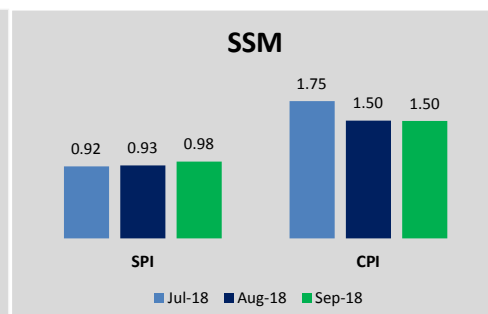
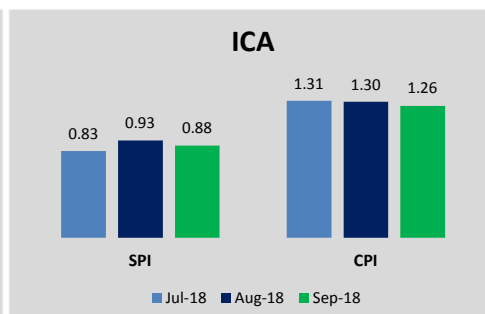
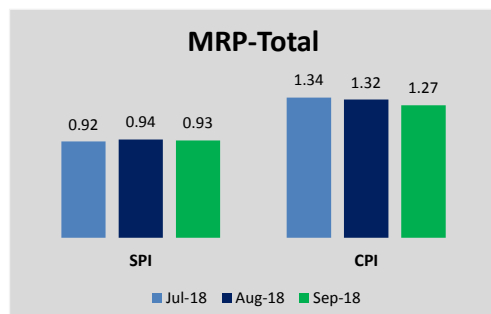


Threshold limits

Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9



Three Month Rolling Performance Comparison 30-Sep-18



Note: For MRP Total, Performance indices over the last three months, SPI remained steady at approximately 0.93 and CPI continued to trend under budget.

### PMI Definitions:

#### CPI (Cost Performance Index)

The cost performance index (CPI) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

#### SPI (Schedule Performance Index)

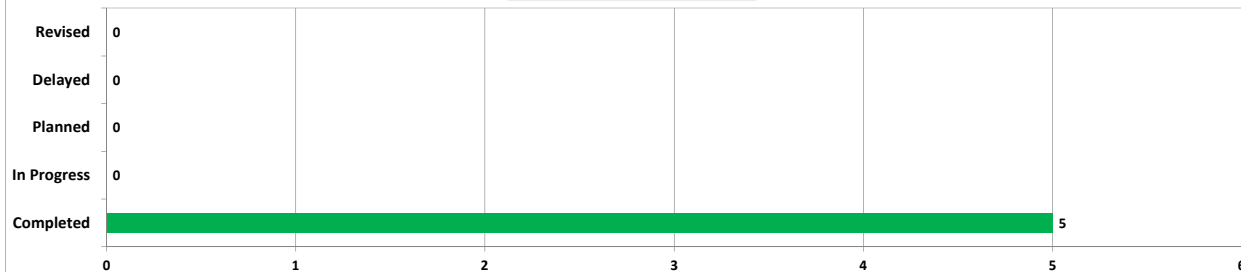
Schedule performance index (SPI) is a ratio of the earned value (EV) to the planned value (PV).  $SPI = EV \div PV$ . If the SPI is less than one, it indicates that the project is potentially behind schedule to-date whereas an SPI greater than one, indicates the project is running ahead of schedule

**SSM-Project Milestone Status**

30-Sep-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision- Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	28-Sep-18	28-Sep-18	27-Sep-18	27-Sep-18	Completed	

**Milestone (2017-2018)**



**SSM-Design Elements Progress**

30-Sep-18

S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 2: Energy Ref Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
2	DE 1: Energy Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
3	DE 3: Energy Ref Price loss Component	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
4	DE 6: Supplier Pricing	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
5	DE 7: Operating Reserve Reference Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
6	DE 8: Reserve Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
7	DE 11: Multi-interval optimization (MIO) pricing run and ramp rate Multiplier	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
8	DE4: Pre or Post interval pricing	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
9	DE 5: Intertie Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
10	DE 9: Resolving Constraint Violations	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
11	DE 12: Pricing setting Eligibility for Resources	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
12	DE 10: Out of Market Operator Actions	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
13	DE 18: Make Whole Payment	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
14	DE 19: Uplift Recovery	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
15	DE 13: Mitigation Process	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
16	DE 14: Timing of Application	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
17	DE:15 Reference Levels	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
18	DE 16: Pricing for Loads	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
19	DE 17: Congestion Rents & Loss residuals	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		

**Notes:**

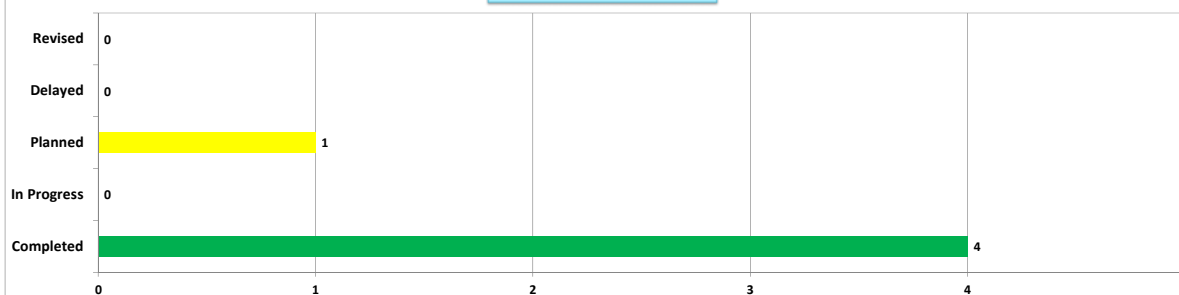
1. Review 1 : Includes internal review of all design elements in three different parts
2. Review 2 : Internal review of HLD (all three parts combined)
3. Review 3 : Publish HLD to external stakeholders
4. Review 4: Incorporate comments on HLD from external Stakeholders
5. Review 5: HLD Approval

**DAM-Project Milestone Status**

30-Sep-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	19-Jul-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	

**Milestone (2017-2018)**



**DAM-Design Elements Progress**

30-Sep-18

S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Offer Obligations (formerly Reference Quantity)	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
2	DE 4: Reliability Input Parameters	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
3	DE 6: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
4	DE 8: Submission and Posting Deadlines	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
5	DE 9: Initiation of Operational Commitments	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
6	DE 11: Price Setting Eligibility	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
7	DE 12: Reporting Obligations	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
8	DE 14: Two Settlement for Supply	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
9	DE 16: Uplift Recovery	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
10	DE 3: Supply Participation: Variable Generation	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
11	DE 17: Financial Transmission Rights	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
12	DE 18: Market System Failures	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
13	DE 2: Load Participation	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
14	DE 5: Virtual Transactions	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
15	DE 7: Optimizattion Energy Limited Resources	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
16	DE 15: Make Whole Payments	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
17	DE10: Market Power Mitigation	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
18	DE 13: Two Settlement for Load	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				

**Notes:**

- Review 1 : Includes internal review of all design elements in three different parts
- Review 2 : Internal review of HLD (all three parts combined)
- Review 3 : Publish HLD to external stakeholders
- Review 4: Incorporate comments on HLD from external Stakeholders
- Review 5: HLD Approval



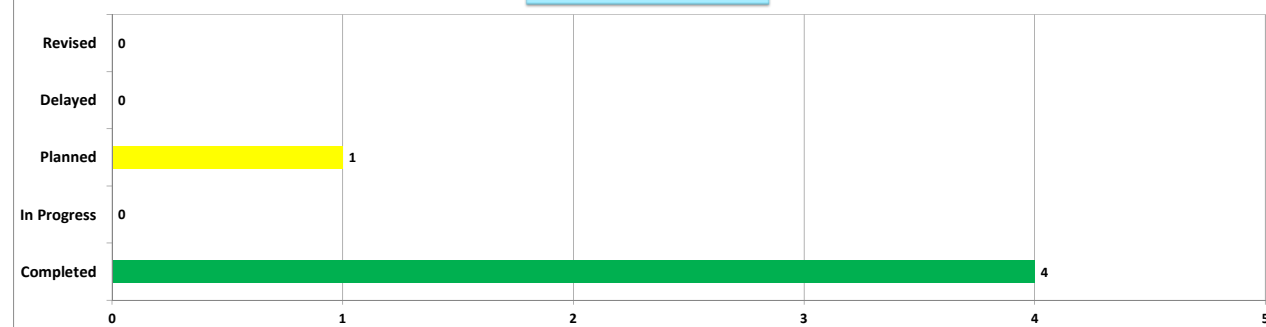
ERUC-Executive Overview

**ERUC-Project Milestone Status**

30-Sep-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	

**Milestone (2017-2018)**



**ERUC-Design Elements Progress**

30-Sep-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
2	DE 2: Look Ahead Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
3	DE 3: Timing and Frequency of Run	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
4	DE 4: Time Step	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
5	DE 5: Intertie Transactions	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
6	DE 6: Must Offer Requirements	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
7	DE 7: Eligibility for Make-whole	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
8	DE 8: Market Participant Data	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
9	DE 9: Commitment Cost Mitigation	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
10	DE10: Offer Changes	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
11	DE 11: Binding Start-up Instruction and Operational Constraint	10	6	Completed	Completed	Completed	Completed	Completed	Completed				
12	DE 12: Calculation of Make Whole Payment	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
13	DE 13: Failure Charge	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				

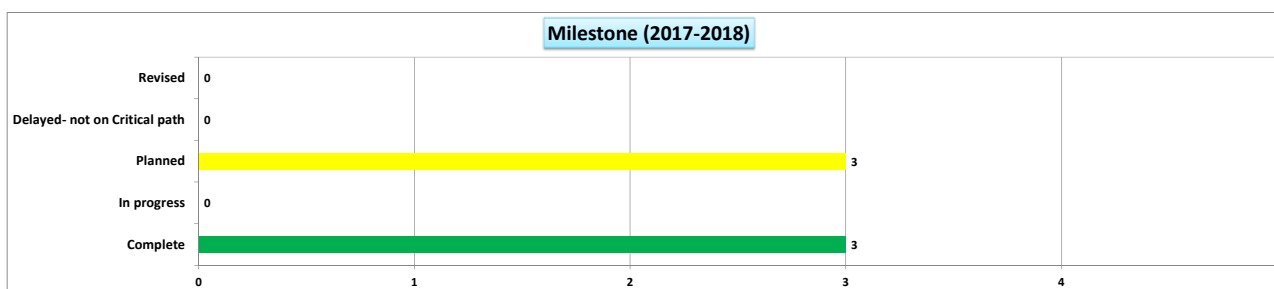
Notes:

1. Review 1 : Includes internal review of all design elements in three different parts
2. Review 2 : Internal review of HLD (all three parts combined)
3. Review 3 : Publish HLD to external stakeholders
4. Review 4: Incorporate comments on HLD from external Stakeholders
5. Review 5: HLD Approval

**ICA-Project Milestone Status**

30-Sep-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	18-May-17	20-Jul-17	18-May-17	20-Jul-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations-Phase 2	16-Aug-17	17-Apr-18	16-Aug-17	14-Jun-18	Completed	
4	RFP for Auction Engine	19-Dec-18	4-Dec-19			Planned	RFI Completed, RFP Process reforecast based on ICA priorities, Scheduled for Q1 2019
5	Stakeholder Engagement- Design Decision Presented	12-Sep-18	19-Oct-18			Planned	Next Session Oct. 18 & 19
6	Publish HLD internally for review 1	19-Dec-18	1-Feb-19			Planned	



**ICA-Design Elements Progress**

30-Sep-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
										Internal	External Stakeholders	Internal	Approval
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft HLD Templates	6. Draft HLD Contents	7. Review 1	8. Review 2	9. Review 3	10. Review 4
1	DE 1: Participation Requirement	10	3	Completed	Completed	Completed	In Progress						
2	DE 2: Resource Eligibility	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
3	DE 3: Qualified Capacity	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
4	DE 4: Market Power Mitigation	10	3	Completed	Completed	Completed	In Progress						
5	DE 5: Length of Forward Period	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
6	DE 6: Commitment Period	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
7	DE 7: Multi-Year Commitments	10	3	Completed	Completed	Completed	In Progress						
8	DE 8: Locational Considerations	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
9	DE 9: Slope of Demand Curve	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
10	DE 10: Target Capacity	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
11	DE 11: Min/Max Capacity Limits	10	3	Completed	Completed	Completed	In Progress						
12	DE 12: Net Cost of New Entry	10	3	Completed	Completed	Completed	In Progress						
13	DE 13: Max Auction Clearing Price	10	3	Completed	Completed	Completed	In Progress						
14	DE 14: Rebalancing Auctions	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
15	DE 15: Resource Obligations (within forward period)	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
16	DE 16: Non-Performance Implications (within forward period)	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
17	DE 17: Resource Performance Obligations	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
18	DE 18: Performance Assessment	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
19	DE 19: Cost Recovery	10	3	Completed	Completed	Completed	In Progress						
20	DE 20: Auction Mechanics	10	3	Completed	Completed	Completed	In Progress						
21	DE 21: Settlements	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				

**Notes:**

1. Review 1 : Informal internal review of individual sections of HLD
2. Review 2 : Publish HLD to external stakeholders
3. Review 3 : Revise HLD Document based on External Stakeholders feedback
4. Review 4: HLD Document Approval

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**Program: MRP-Market Renewal Program**

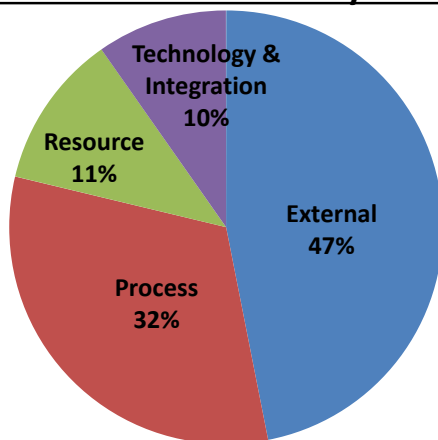
**Monthly Risk Report For MRESC**

*September 30, 2018*

Document Ref. No.: PRG\_MRR06

**Period: Month Ending: 30-Sep-18**

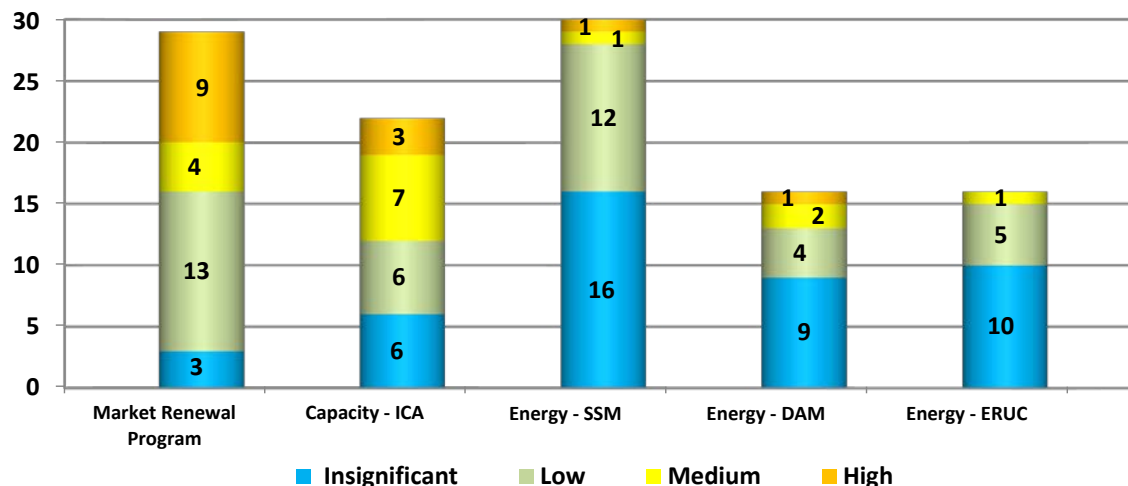
**MRP - Total Residual Risk By Category**



All program and project risks have been categorised into four categories, with the largest category of risks being categories as "Process" risks.

**MRP - Total Residual Risk By Project**

Number of Risks



All MRP Risks have been divided into the four projects: SSM, DAM, ERUC and ICA, and Program risks. Each identified risk was assessed with the project team, and the document the risk response tasks that will be implemented proactively to prevent or at least reduce the level of the identified risk. In total we currently have 113 Risks

**MRP RISK SUMMARY - MRESC as of Sept 30, 2018**

**TOP MRP CONTROLABLE RISKS - OPEN**

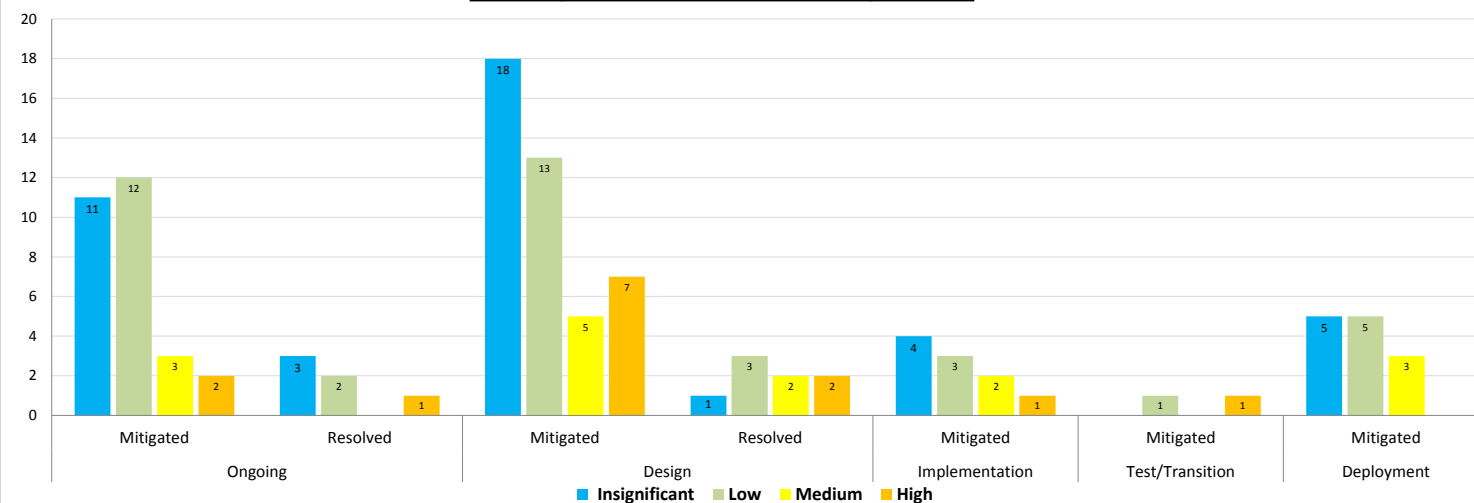
Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
ICA_R024	Capacity - ICA	Design	Process	Lack of clarity regarding division of accountability between ICA Team and line of business	High	Engage internal stakeholders regarding roles and responsibilities of line staff vs. the ICA Team	Mitigated	↓
DAM_R012	Energy - DAM	Design	Process	Contracted or rate-regulated participants may be resistive to DAM participation rules and two-settlement outcomes	High	Develop a strategic engagements plan with the SE team	Mitigated	—
DAM_R007	Energy - DAM	Design	Process	Contract negotiations fail to incent sufficient participation to achieve material price convergence between DAM & Real Time	High	Ensure full participants engaging/soliciting on design features to ensure design will incentivize (price certainty, overall lower cost, etc...)	Mitigated	—
MRP_R005	Market Renewal Program	Ongoing	Process	Difficulty reaching agreement with internal stakeholders (Change Management).	High	Operations and IT Leads assigned to reduce the impact as they are representing their respective areas. Director's Forum is setup to facilitate these escalations. Final step for resolution is the MRESC	Mitigated	↓
MRP_R003	Market Renewal Program	Ongoing	Process	Critical interdependencies with other projects (e.g. CRS Replacement)	High	MRP Representation on dependent projects and representation on PSC. MRP leads and BA's to work with dependant projects to identify any impacts during design phase.	Mitigated	—
ICA_R019	Capacity - ICA	Test/Transition	Process	The need for parallel activities on timeline (e.g. market rules with market manuals at technical panel)	High	Start activities as early as possible.	Mitigated	—
MRP_R015	Market Renewal Program	Implementation	Technology & Integration	Design decisions need to be revisited due to technical limitations	High	IT Lead and resources have been introduced early on the program to reduce the likelihood and impact of this occurring. Furthermore software vendors will be part of the HLD.	Mitigated	—

**TOP MRP CONTROLABLE RISKS - RESOLVED**

Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R022	Market Renewal Program	Design	Process	Business Case approvals - approval delays could cause release of Capital expenditure for Detail work on Energy and Capacity work streams	High	Finance has proposed capitalisation expenditure rules that are referencing that the preliminary project stage is completed, and Management, with the relevant authority, implicitly or explicitly authorizes and commits to funding a computer software project. Instead of an approved business case.	Resolved	—

Number of Risks

**MRP- Program Residual Risk Status Per Program Phase**



**Updates on KPMG Risk Assessment**

\*KPMG has completed all interviews with MRP Leads, and met with and on October 17 to discuss IT integration risks.

\* Revised PMO Risk Methodolgy under review that aligns with ERM model.

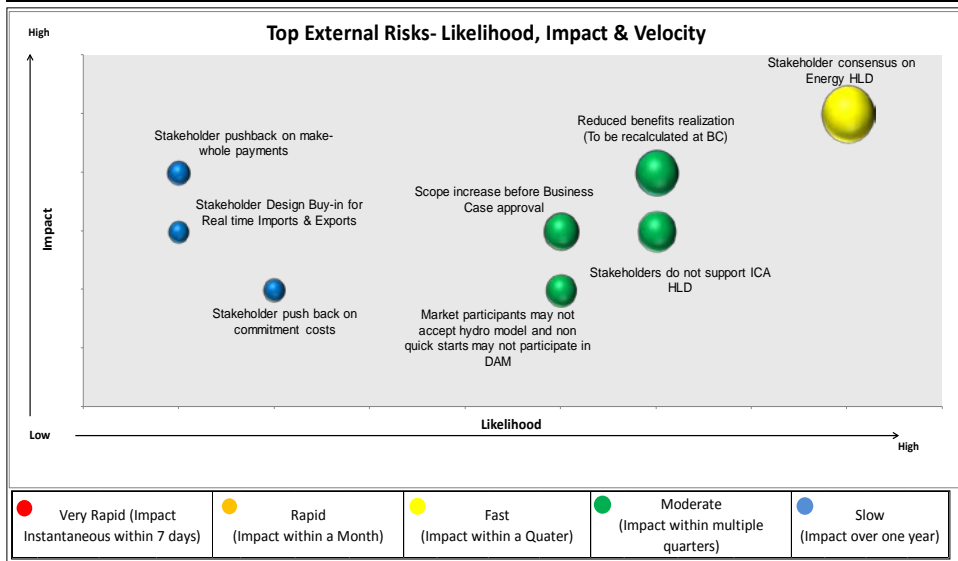
\*Revising Residual Risk Rating based on revised PMO Risk Methodolgy (50% completed)

\* Added risk velocity as measurement for both MRESC and BOD risk report

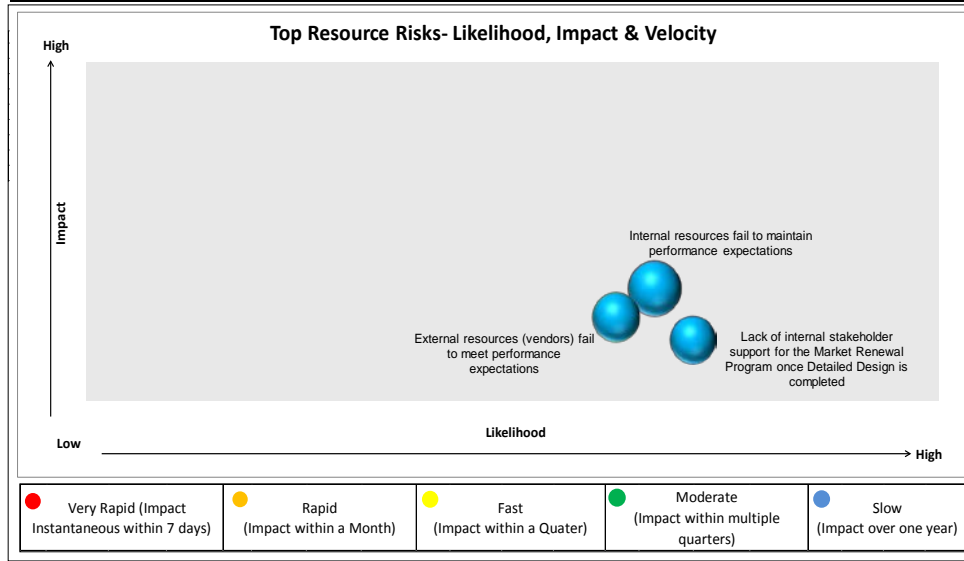
## MRP RISK SUMMARY - MRESC as of Sept 30, 2018

### RISK VELOCITY PER CATEGORY

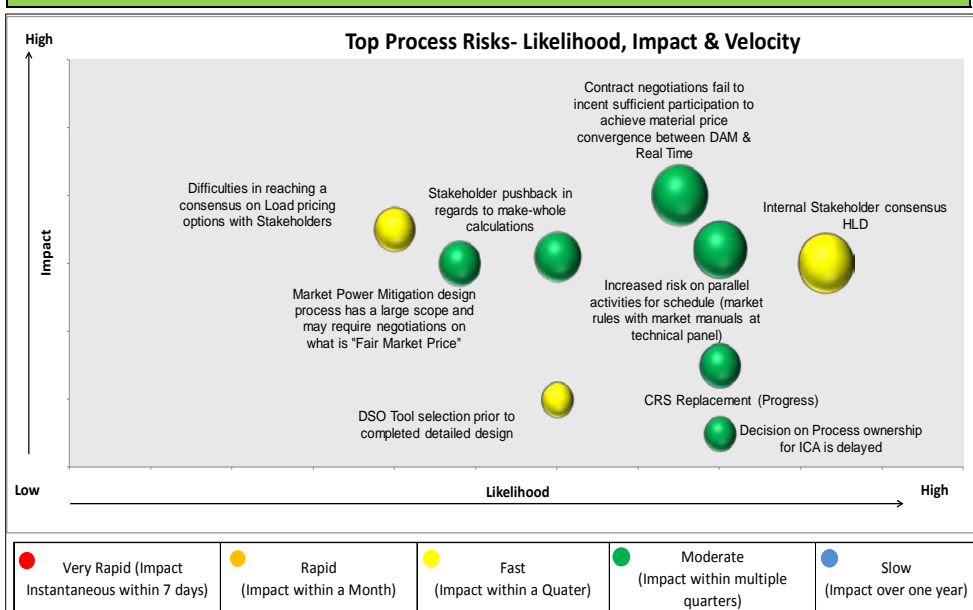
#### External Risks - Risk Velocity



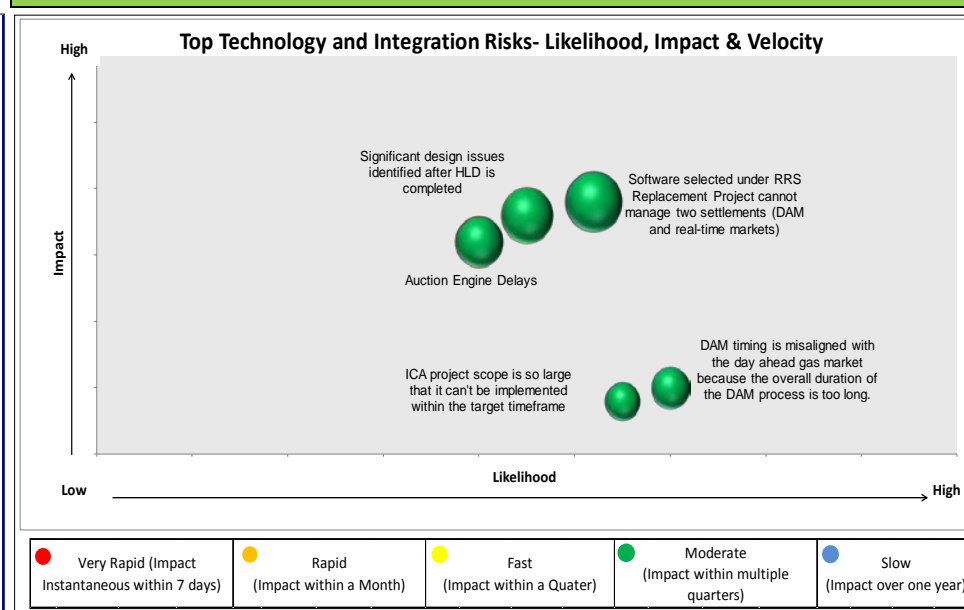
#### Resource Risks - Risk Velocity



#### Process Risks - Risk Velocity



#### IT & Integration - Risk Velocity



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# MARKET RENEWAL PROGRAM DASHBOARD

## Key Summary

### Schedule

The program is overall slightly behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.92. This value is in the Green category. Within the program, the Energy work stream SPI is 0.98 (Green), which is consistent with last month; the Capacity work stream SPI is 0.84 (Yellow), which is a slip from last month.

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.06. This value is in the Green category, and corresponds to the SPI being less than 1. The program has not been able to spend the budgeted money on the consultants and resources as planned in the schedule, resulting in an overall underspend against the forecast. The Energy work stream CPI is 1.00 while the Capacity work stream CPI is 1.08.

### Risk

Risk consultant, KPMG, is working jointly with the MRP and Enterprise Risk teams. The PMO Risk Methodology has been revised and now aligns with ERM model. Next steps will be to roll out within Enterprise change by end Jan 2019. Post MRP Risk Interview findings completed, and finding to be presented to MRESC.

### Upcoming Milestones

External stakeholder feedback on the High Level Design document for the Single Schedule Market (SSM) is due on November 22. The remaining high level designs for the Energy work stream are scheduled to be published in December 2018.

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**Program: MRP-Market Renewal Program**

Monthly Cost Report for MRESC  
November 12, 2018

Document Ref. No.: PRG\_MCR10

**Period: Month Ending  
31-Oct-18**

<b><u>Program Cost Summary:</u></b>					
	2017 <sup>(1)</sup>		2018 <sup>(1)</sup>		
	Operating	Capital	Operating	Capital	Total <sup>(5)</sup>
<b>Business Plan Approved Costs</b>	9,247		12,700	4,000	16,700
Contingency	2,760				
<b>Business Plan with Contingency</b>	<b>12,007</b>		<b>12,700</b>	<b>4,000</b>	<b>16,700</b>
<b>Forecast</b>	7,972				
2018 Forecast Baseline (end Q1-2018)			17,700	681	18,381
2018 Forecast Rolling <sup>(2)</sup>			15,163	1,142	16,305
Contingency <sup>(3)</sup>				90	90
<b>Forecast with Contingency</b>	<b>7,972</b>		<b>15,163</b>	<b>1,232</b>	<b>16,395</b>
Variance (2018 Rolling vs Baseline Forecast)			-2,537	551	
<b>Actual Costs <sup>(4)</sup></b>	7,902	201	12,545	808	13,352
Contingency					
<b>Actual with Contingency</b>	<b>7,902</b>	<b>201</b>	<b>12,545</b>	<b>808</b>	<b>13,352</b>

Notes:

(1) Report in thousands (000's).

(2) Includes Q4 Capital Forecast for SSM.

(3) No contingency for 2018 operating forecasted costs.

(4) Actual costs for 2018 are YTD.

(5) Total shows combined operating and capital costs for current year.



## MRP - Operating Financial Summary - 31-Oct-18

The Business Plan Approved Costs for MRP have been divided into the four projects: SSM, DAM, ERUC, and ICA, as well as a general account for tracking costs associated with Program related activities. Each project has been forecasted to reflect the cost expectations for 2018. The actual costs will be tracked against the 2018 baseline forecast.

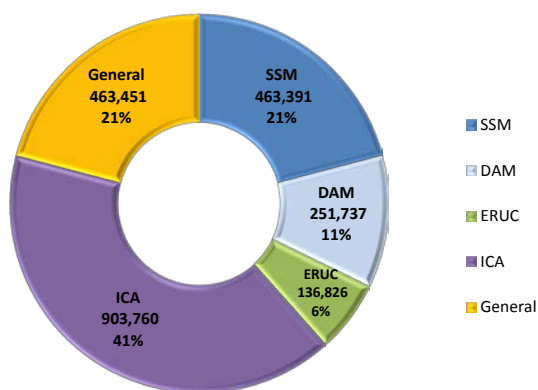
### Variance Summary:

MRP spend for October is 3% above the baseline forecast, with the Year to Date spend being 7% below forecast. DAM and ERUC shows an increase in costs for October as the projects ramp up effort on completing the High Level Design documents.

### Overview of MRP Monthly Costs: 31-Oct-18

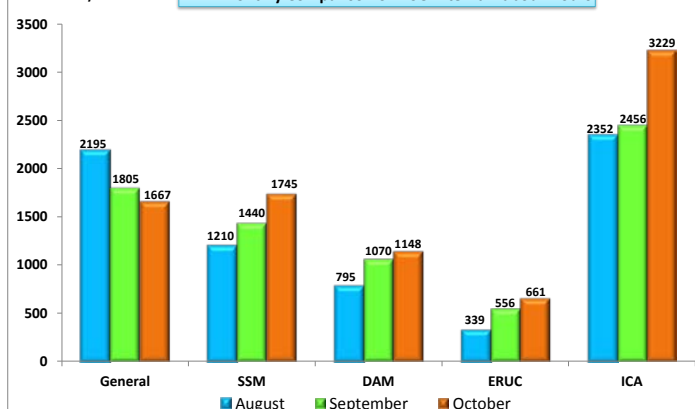
MRP Operating Costs													
Monthly								Year to Date					
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 31-Oct-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$219,849	\$460,566	\$463,391	\$2,825	1%	Above Forecast		\$2,276,743	\$2,127,790	\$1,910,497	(\$217,293)	(10%)	Below Forecast
DAM	\$72,845	\$102,500	\$251,737	\$149,237	146%	Above Forecast		\$771,578	\$1,080,642	\$1,447,342	\$366,700	34%	Above Forecast
ERUC	\$72,845	\$102,050	\$136,826	\$34,776	34%	Above Forecast		\$771,578	\$952,663	\$870,411	(\$82,252)	(9%)	Below Forecast
ICA	\$286,172	\$768,099	\$903,760	\$135,661	18%	Above Forecast		\$2,948,773	\$4,227,342	\$4,147,501	(\$79,840)	(2%)	Below Forecast
General	\$378,472	\$711,833	\$463,451	(\$248,382)	(35%)	Below Forecast		\$3,870,974	\$5,086,744	\$4,168,974	(\$917,770)	(18%)	Below Forecast
Total Program	\$1,030,184	\$2,145,048	\$2,219,165	\$74,117	3%	Above Forecast		\$10,639,645	\$13,475,181	\$12,544,725	(\$930,455)	(7%)	Below Forecast

Monthly Actual Costs by Project



Notes:- The above graph reflects MRP actual cost allocation per projects and percentage. The monthly cost split shows a relatively even split between the Capacity and Energy workstreams, with 41% and 38% respectively, while 21% of the costs were allocated to the General account.

MRP Monthly Comparison of IESO Internal Labour Hours

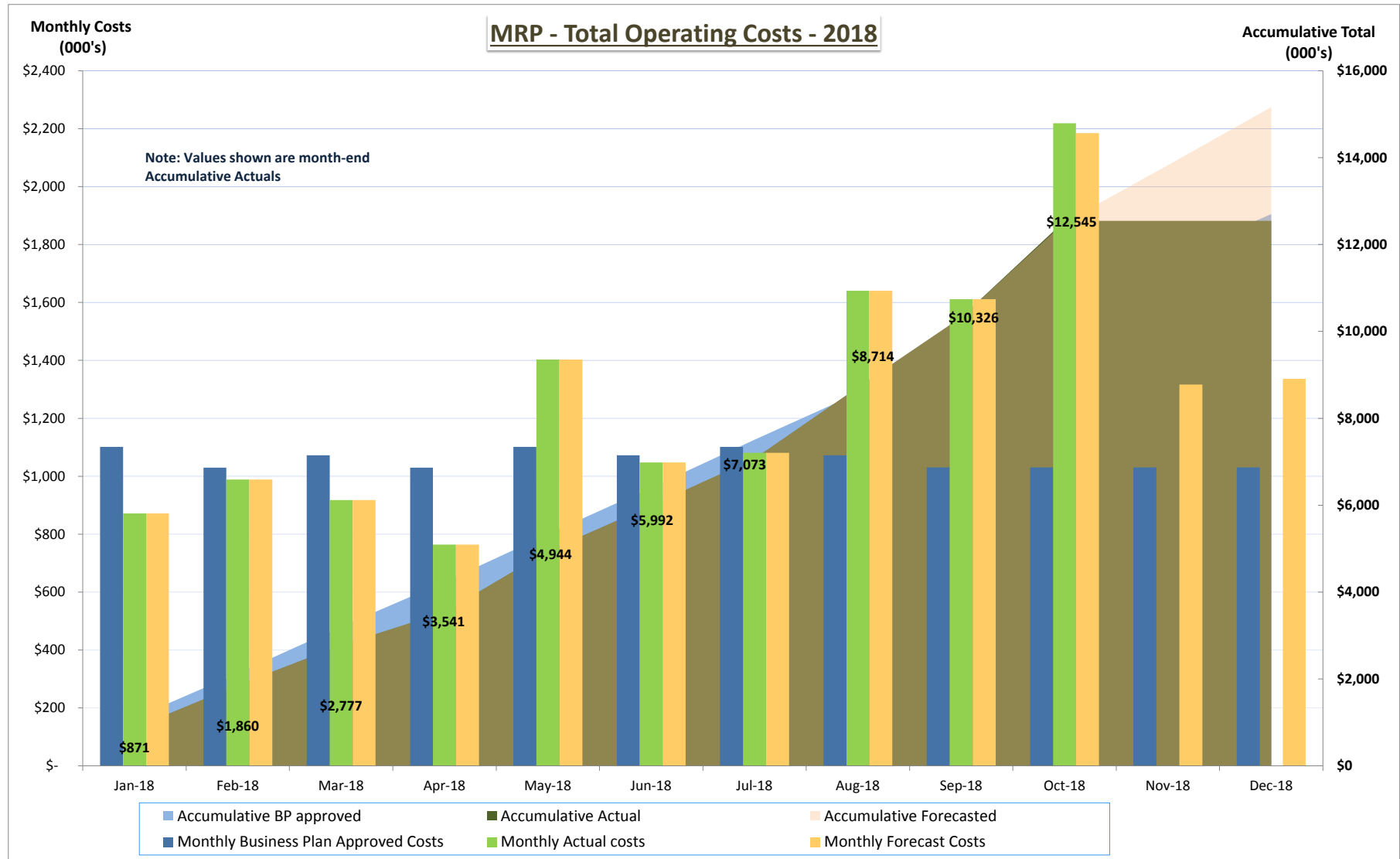


Notes:- October has a six week reporting cycle, however the hours displayed are normalized monthly. DAM and ERUC shows an increase in hours as the team ramps up effort to finalize High Level Designs. SSM, ICA and General are also aligned with expectations.

MRP Monthly Comparison - 2018 Operating Actuals

Project	Jan	Feb	Mar	Apr	May	June	July	August	September	October	YTD
SSM	69,769	88,106	83,920	151,393	221,896	177,132	148,711	276,328	229,851	463,391	1,910,497
DAM	105,936	112,941	92,211	87,294	182,775	141,457	136,415	146,652	189,924	251,737	1,447,342
ERUC	72,792	80,158	97,317	55,286	86,282	84,620	94,655	92,296	70,180	136,826	870,411
ICA	358,104	272,219	234,502	167,162	494,585	296,332	320,248	545,146	555,445	903,760	4,147,501
General	264,630	435,358	409,454	302,561	417,810	348,220	380,858	580,407	566,226	463,451	4,168,974
<b>Total</b>	<b>871,230</b>	<b>988,782</b>	<b>917,404</b>	<b>763,695</b>	<b>1,403,349</b>	<b>1,047,761</b>	<b>1,080,887</b>	<b>1,640,828</b>	<b>1,611,626</b>	<b>2,219,165</b>	<b>12,544,725</b>





Notes:- The above graph compares monthly actuals against a monthly rolling forecast. October actuals have been readjusted to include costs of MRP timesheets charged to other business units.

## MRP - Capital Financial Summary - 31-Oct-18

The capital costs approved under the 2018 Approved Business Plan is to capture the costs of detailed design work projected for 2018 as well as the costs for relocating the MRP team to our UMR location.

### Variance Summary:

Capital Spend YTD reflects delay in delivery of AV Equipment for the meeting rooms at UMR. As expected the monitors for the AV equipment were delivered in September, with video conferencing equipment expected to be installed by the end of November.

### Notable Improvements:

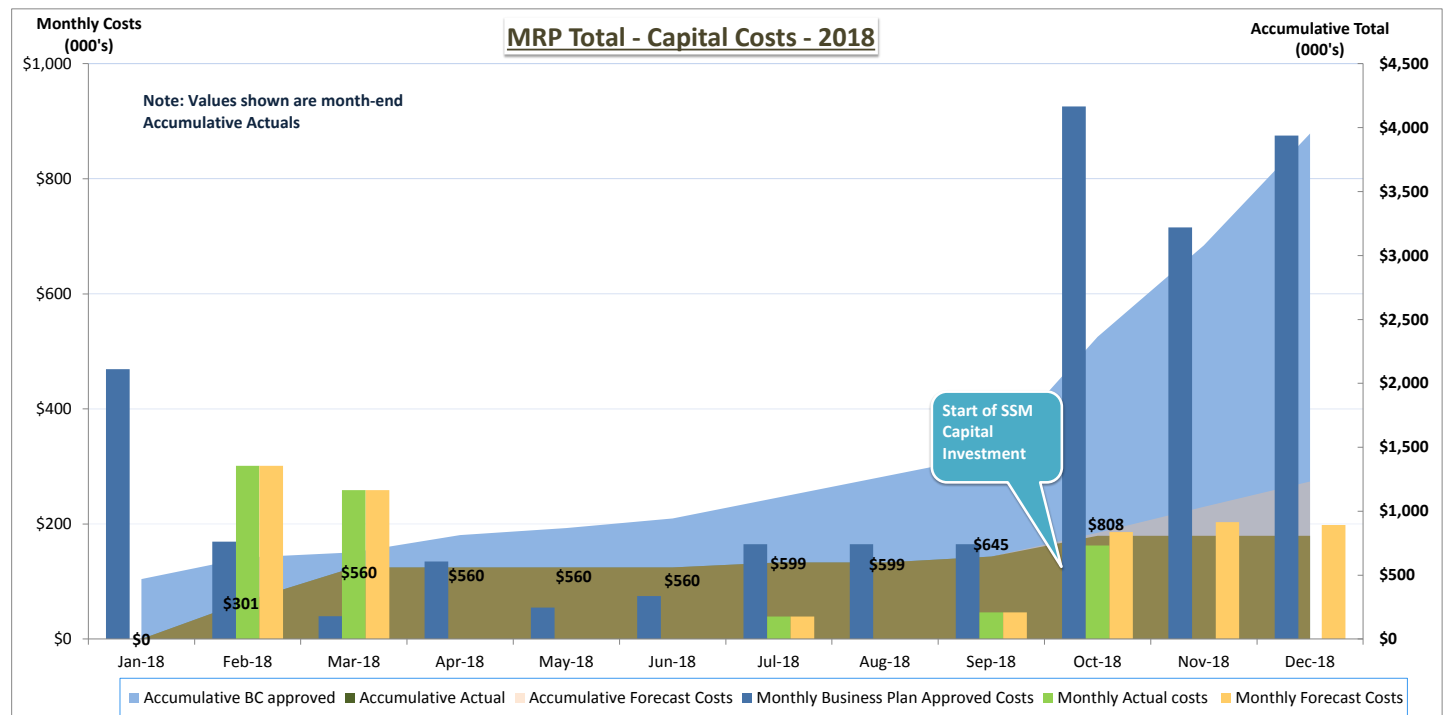
For October SSM has started to capitalize some costs as the project transitions into the Detailed Design phase.

The majority of the AV equipment were installed in October with the final installation of the video conferencing equipment expected in November.

## Overview of MRP Monthly Costs:

31-Oct-18

MRP Capital Costs								Year to Date					
Monthly													
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 31-Oct-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$378,735	\$ -	\$154,841	\$154,841	-	Above Forecast		\$468,735		\$154,841	\$154,841	-	Above Forecast
General - UMR	\$ -	\$ -	\$7,558	\$7,558	-	Above Forecast		\$965,960	\$771,297	\$652,830	(\$118,467)	(15%)	Below Forecast
<b>Total Program</b>	<b>\$378,734.50</b>	<b>\$ -</b>	<b>\$162,399</b>	<b>\$162,399</b>	<b>-</b>	<b>Above Forecast</b>		<b>\$1,434,695</b>	<b>\$771,297</b>	<b>\$807,671</b>	<b>\$36,374</b>	<b>5%</b>	<b>Below Forecast</b>



Notes:- The graph reflects the initial expectations stated in the approved business plan with capital budget of \$4M and with detailed designs beginning in Q4 2018. SSM is now transitioning into Detailed Design and has started to capitalize costs in October. UMR Relocation continues to incur capital costs as the AV equipment gets installed.

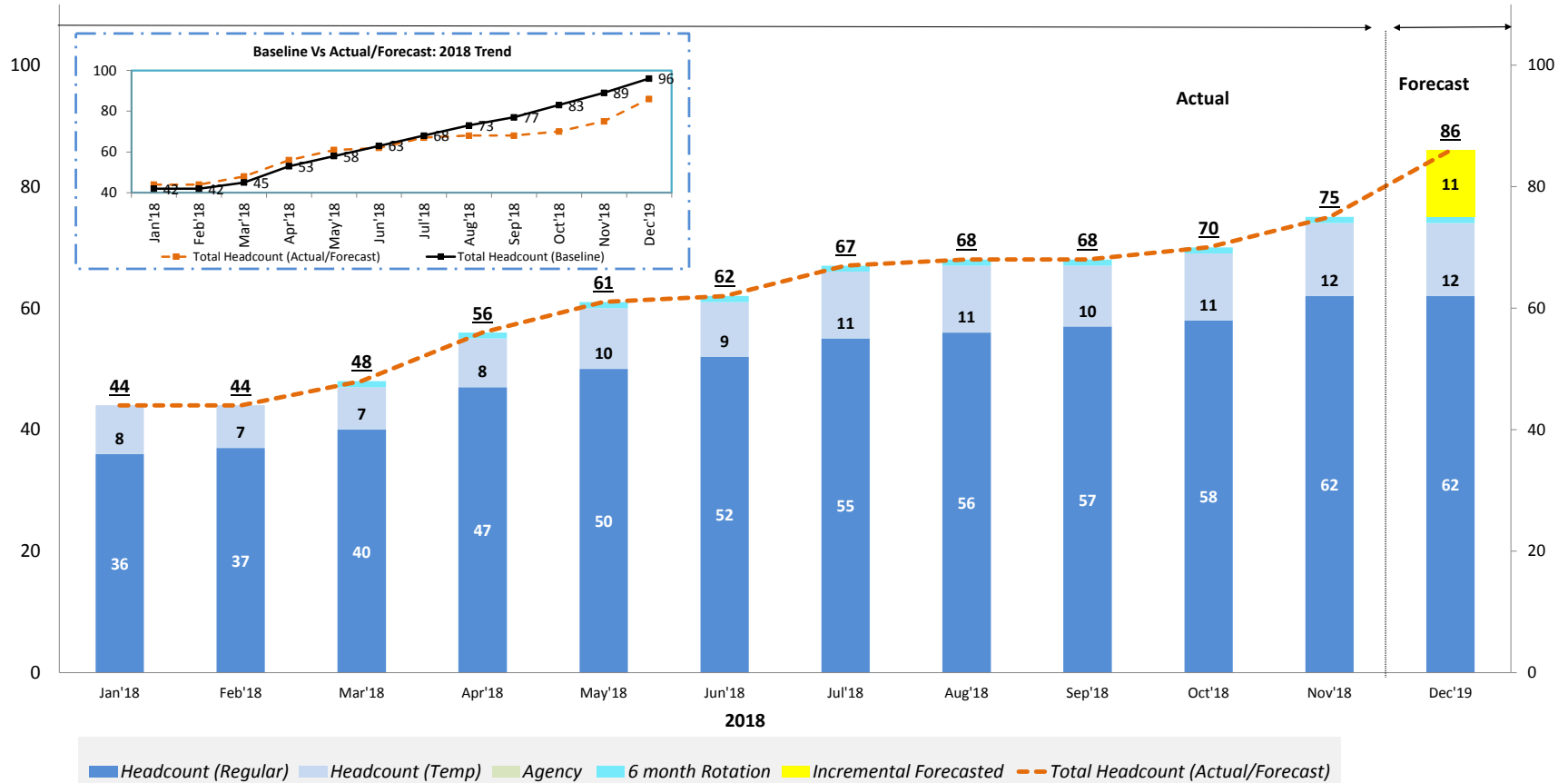
MRP Monthly Comparison - 2018 Capital Actuals											
Project	Jan	Feb	Mar	Apr	May	June	July	August	September	October	YTD
SSM	-	-	-	-	-	-	-	-	-	154,841	154,841
General - UMR Relocation	-	301,297	258,848	-	-	-	39,022	-	46,105	7,588	652,860
<b>Total</b>	<b>-</b>	<b>301,297</b>	<b>258,848</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>39,022</b>	<b>-</b>	<b>46,105</b>	<b>162,429</b>	<b>807,701</b>



Monthly Headcount

**MRP Monthly and Accumulative Headcount - 2018**

Accumulative Headcount



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**Program: MRP-Market Renewal Program**

**Project: Total MRP Program**

**Monthly Schedule Report for MRESC**  
*October 31, 2018*

**Document Ref. No.: MRP\_MSR08\_18-10-31**  
**(MSR ~ 08)**

**Project Commencement Reporting Date: Jan 1, 2018**  
**Project Completion Reporting Date: Dec 31, 2018**

Reporting Range Period	From		To
	<i>January 1, 2018</i>	<<<<< >>>>>	<i>October 31, 2018</i>

For Week ending	<i>October 31, 2018</i>
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Reporting Date	<i>November 9, 2018</i>
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**Program Schedule Status**

Schedule Baseline	Cumulative Planned %	Cumulative Actual %	Variation %	Schedule Variance <sup>(1)</sup>
	87.4%	80.1%	7.3%	Under Threshold

**Month End Project Performance Status**

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	\$15,473,981	\$14,179,835	0.92	Behind Schedule

Cost Performance	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	\$13,352,426	\$14,179,835	1.06	Under Budget

**Legend for Status:**

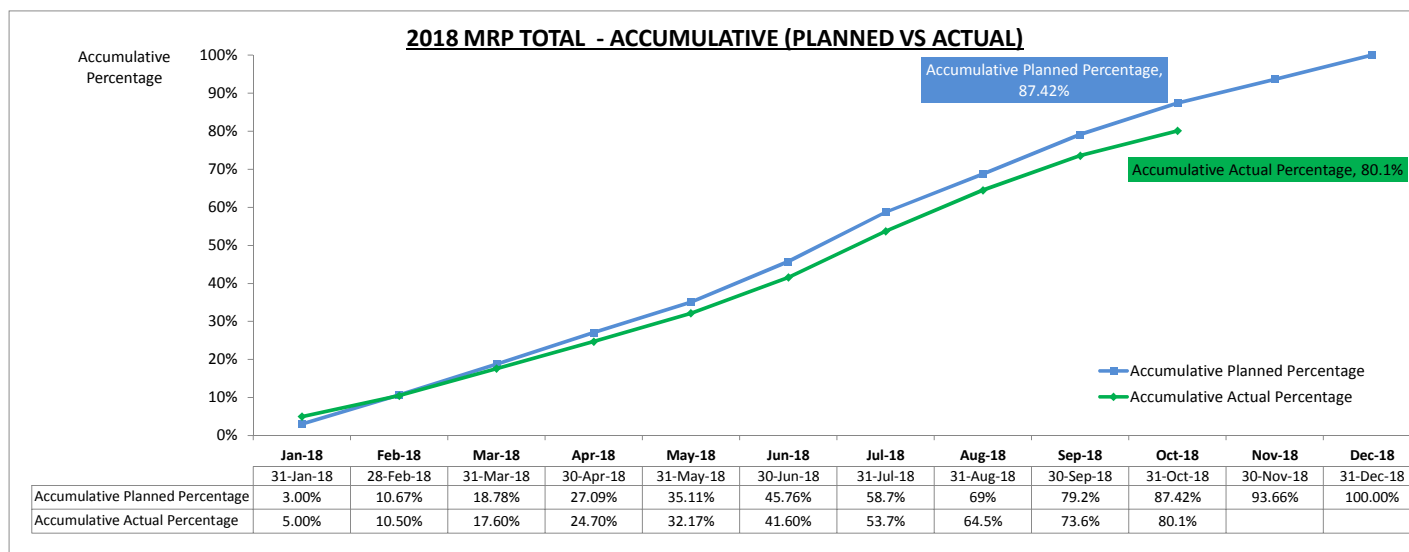
- (1). Threshold upper limit: assumption is -10%, If variation exceed (-10%) threshold limit schedule to be revised  
(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule" or if SPI=1 "On Schedule"  
(3). Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"  
Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.



## Monthly Status as of: 31-Oct-18

PROGRESS INDICATORS								
MRP	2018 Total Forecast at Completion (BAC) <sup>(1)</sup>	2018 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed
SSM	\$2,943,020	\$2,065,338	16.6%	01-Jan-18	31-Dec-18	77.20%	76.99%	12.8%
DAM	\$1,285,642	\$1,447,342	7.3%	01-Jan-18	31-Dec-18	87.46%	84.58%	6.1%
ERUC	\$1,156,763	\$870,411	6.5%	01-Jan-18	31-Dec-18	87.50%	84.58%	5.5%
ICA	\$6,069,638	\$4,147,501	34.3%	01-Jan-18	31-Dec-18	87.65%	73.77%	25.3%
GENERAL	\$6,244,937	\$4,821,834	35.3%	01-Jan-18	31-Dec-18	92.00%	86.00%	30.3%
<b>MRP Total</b>	<b>\$17,700,000</b>	<b>\$13,352,426</b>	<b>100%</b>			<b>87.4%</b>		<b>80.1%</b>

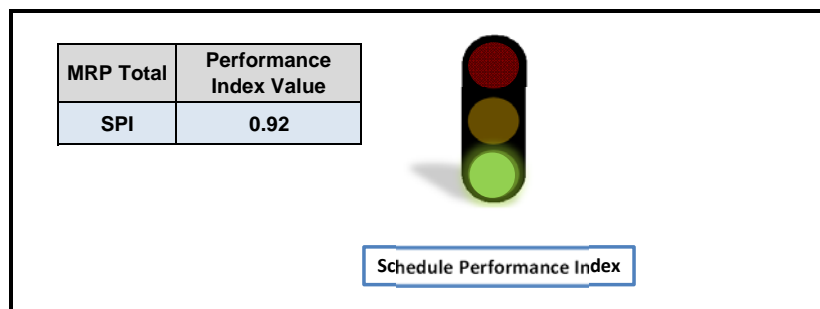
PERFORMANCE INDICATORS			
Earned Value (EV) (BAC X Monthly Scheduled Actual Progress)	Planned Value (PV) (BAC X Monthly Scheduled Planned %)	CPI (EV/AC)	SPI (EV/PV)
\$2,265,831	\$2,272,011	1.10	1.00
\$1,087,396	\$1,124,422	0.75	0.97
\$978,390	\$1,012,168	1.12	0.97
\$4,477,572	\$5,320,038	1.08	0.84
\$5,370,646	\$5,745,342	1.11	0.93
<b>\$14,179,835</b>	<b>\$15,473,981</b>	<b>1.06</b>	<b>0.92</b>



Notes (1) 2018 Forecast values and not Budget values will be used.  
(2) Overall Schedule Variance for MRP Total is -7.3%

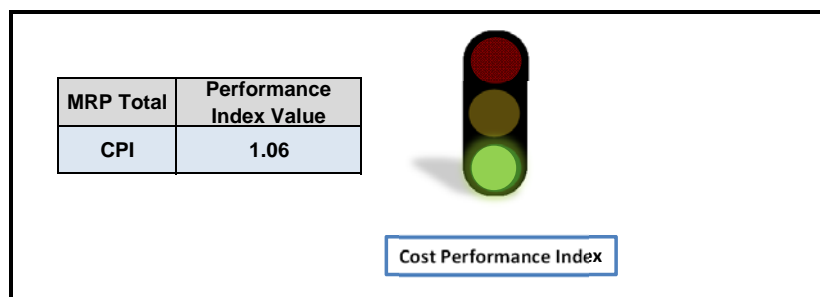


## Monthly Performance Status: 31-Oct-18

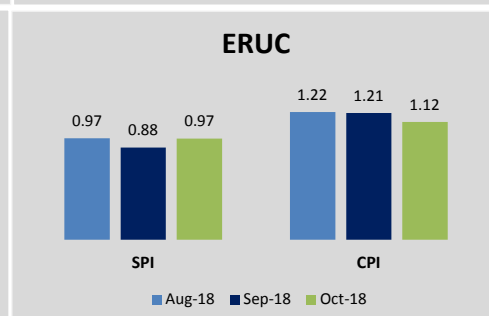
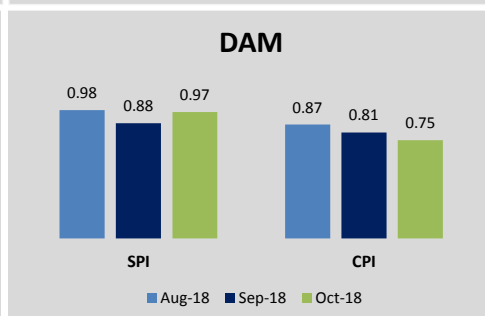
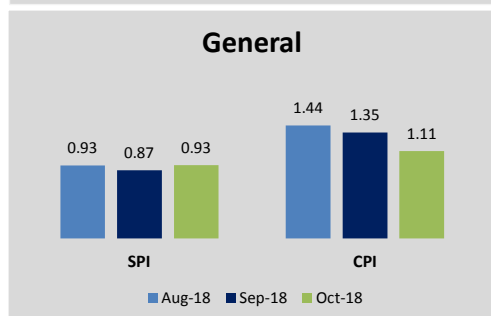
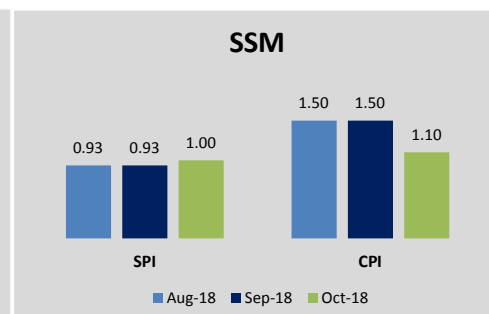
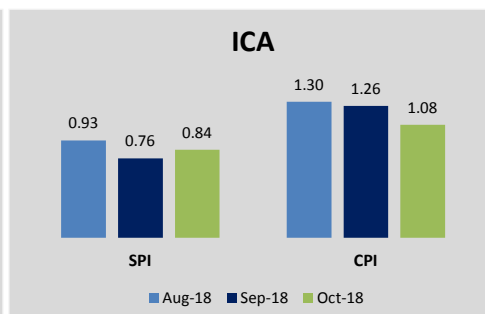
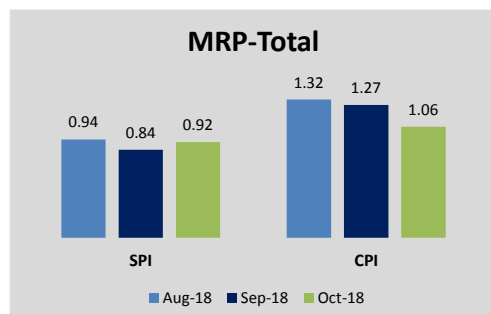


Threshold limits

Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9



## Three Month Rolling Performance Comparison 31-Oct-18



Note: For MRP Total, Performance indices over the last three months, SPI remained steady at approximately 0.92 and CPI continued to trend under budget.

### PMI Definitions:

#### CPI (Cost Performance Index)

The cost performance index (CPI) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

#### SPI (Schedule Performance Index)

Schedule performance index (SPI) is a ratio of the earned value (EV) to the planned value (PV).  $SPI = EV \div PV$ . If the SPI is less than one, it indicates that the project is potentially behind schedule to-date whereas an SPI greater than one, indicates the project is running ahead of schedule

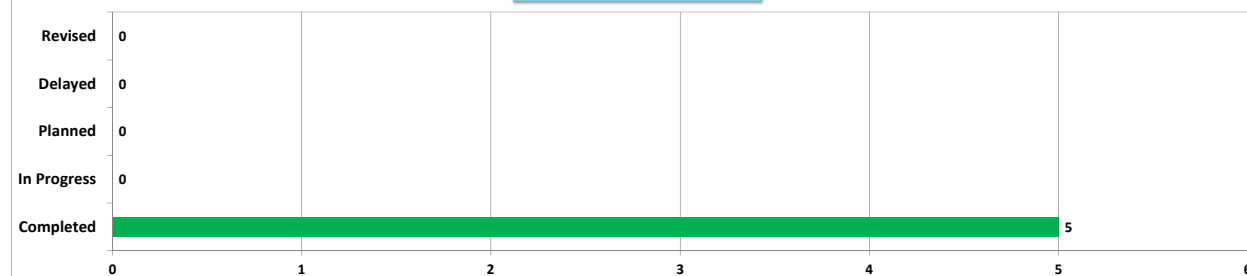


### SSM-Project Milestone Status

31-Oct-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision- Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	28-Sep-18	28-Sep-18	27-Sep-18	27-Sep-18	Completed	

### Milestone (2017-2018)



### SSM-Design Elements Progress

31-Oct-18

S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 2: Energy Ref Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
2	DE 1: Energy Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
3	DE 3: Energy Ref Price loss Component	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
4	DE 6: Supplier Pricing	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
5	DE 7: Operating Reserve Reference Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
6	DE 8: Reserve Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
7	DE 11: Multi-interval optimization (MIO) pricing run and ramp rate Multiplier	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
8	DE4: Pre or Post interval pricing	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
9	DE 5: Intertie Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
10	DE 9: Resolving Constraint Violations	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
11	DE 12: Pricing setting Eligibility for Resources	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
12	DE 10: Out of Market Operator Actions	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
13	DE 18: Make Whole Payment	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
14	DE 19: Uplift Recovery	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
15	DE 13: Mitigation Process	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
16	DE 14: Timing of Application	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
17	DE:15 Reference Levels	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
18	DE 16: Pricing for Loads	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
19	DE 17: Congestion Rents & Loss residuals	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		

#### Notes:

1. Review 1 : Includes internal review of all design elements in three different parts
2. Review 2 : Internal review of HLD (all three parts combined)
3. Review 3 : Publish HLD to external stakeholders
4. Review 4: Incorporate comments on HLD from external Stakeholders
5. Review 5: HLD Approval



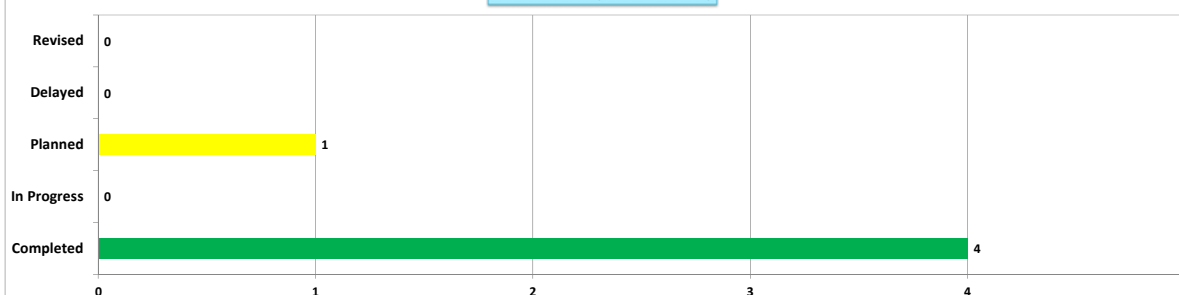


### DAM-Project Milestone Status

31-Oct-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	19-Jul-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	

### Milestone (2017-2018)



### DAM-Design Elements Progress

31-Oct-18

S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Offer Obligations (formerly Reference Quantity)	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
2	DE 4: Reliability Input Parameters	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
3	DE 6: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
4	DE 8: Submission and Posting Deadlines	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
5	DE 9: Initiation of Operational Commitments	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
6	DE 11: Price Setting Eligibility	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
7	DE 12: Reporting Obligations	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
8	DE 14: Two Settlement for Supply	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
9	DE 16: Uplift Recovery	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
10	DE 3: Supply Participation: Variable Generation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
11	DE 17: Financial Transmission Rights	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
12	DE 18: Market System Failures	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
13	DE 2: Load Participation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
14	DE 5: Virtual Transactions	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
15	DE 7: Optimization Energy Limited Resources	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
16	DE 15: Make Whole Payments	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
17	DE10: Market Power Mitigation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
18	DE 13: Two Settlement for Load	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			

#### Notes:

- Review 1 : Includes internal review of all design elements in three different parts
- Review 2 : Internal review of HLD (all three parts combined)
- Review 3 : Publish HLD to external stakeholders
- Review 4: Incorporate comments on HLD from external Stakeholders
- Review 5: HLD Approval

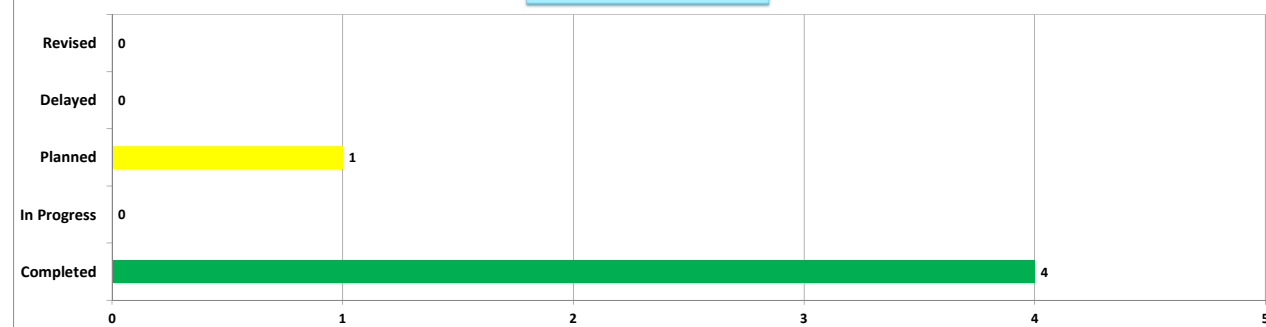


# **ERUC-Project Milestone Status**

31-Oct-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	

## **Milestone (2017-2018)**



# **ERUC-Design Elements Progress**

31-Oct-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
2	DE 2: Look Ahead Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
3	DE 3: Timing and Frequency of Run	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
4	DE 4: Time Step	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
5	DE 5: Intertie Transactions	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
6	DE 6: Must Offer Requirements	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
7	DE 7: Eligibility for Make-whole	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
8	DE 8: Market Participant Data	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
9	DE 9: Commitment Cost Mitigation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
10	DE10: Offer Changes	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
11	DE 11: Binding Start-up Instruction and Operational Constraint	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
12	DE 12: Calculation of Make Whole Payment	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
13	DE 13: Failure Charge	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			

## **Notes:**

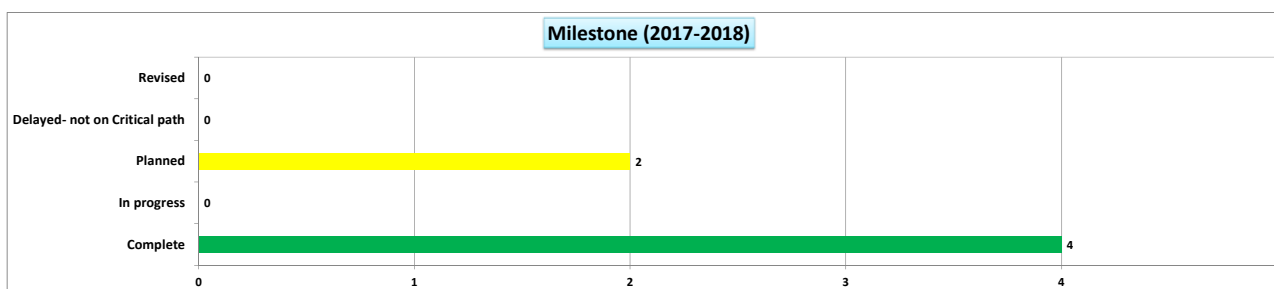
1. Review 1 : Includes internal review of all design elements in three different parts
2. Review 2 : Internal review of HLD (all three parts combined)
3. Review 3 : Publish HLD to external stakeholders
4. Review 4: Incorporate comments on HLD from external Stakeholders
5. Review 5: HLD Approval



### ICA-Project Milestone Status

31-Oct-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	18-May-17	20-Jul-17	18-May-17	20-Jul-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations-Phase 2	16-Aug-17	17-Apr-18	16-Aug-17	14-Jun-18	Completed	
4	RFP for Auction Engine	19-Dec-18	4-Dec-19			Planned	RFI Completed, RFP Process reforecasted based on ICA priorities, Scheduled for Q1 2019
5	Stakeholder Engagement- Design Decision Presented	12-Sep-18	19-Oct-18			Completed	
6	Publish HLD internally for review 1	19-Dec-18	1-Feb-19			Planned	



### ICA-Design Elements Progress

31-Oct-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
										Internal	External Stakeholders	Internal	Approval
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft HLD Templates	6. Draft HLD Contents	7. Review 1	8. Review 2	9. Review 3	10. Review 4
1	DE 1: Participation Requirement	10	3	Completed	Completed	Completed	In Progress						
2	DE 2: Resource Eligibility	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
3	DE 3: Qualified Capacity	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
4	DE 4: Market Power Mitigation	10	3	Completed	Completed	Completed	In Progress						
5	DE 5: Length of Forward Period	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
6	DE 6: Commitment Period	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
7	DE 7: Multi-Year Commitments	10	3	Completed	Completed	Completed	In Progress						
8	DE 8: Locational Considerations	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
9	DE 9: Slope of Demand Curve	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
10	DE 10: Target Capacity	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
11	DE 11: Min/Max Capacity Limits	10	4	Completed	Completed	Completed	Completed						
12	DE 12: Net Cost of New Entry	10	3	Completed	Completed	Completed	In Progress						
13	DE 13: Max Auction Clearing Price	10	3	Completed	Completed	Completed	In Progress						
14	DE 14: Rebalancing Auctions	10	3	Completed	Completed	Completed	In Progress	In Progress	In Progress				
15	DE 15: Resource Obligations (within forward period)	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
16	DE 16: Non-Performance Implications (within forward period)	10	5	Completed	Completed	Completed	Completed	Completed	In Progress				
17	DE 17: Resource Performance Obligations	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
18	DE 18: Performance Assessment	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				
19	DE 19: Cost Recovery	10	4	Completed	Completed	Completed	Completed						
20	DE 20: Auction Mechanics	10	4	Completed	Completed	Completed	Completed						
21	DE 21: Settlements	10	4	Completed	Completed	Completed	Completed	In Progress	In Progress				

**Notes:**

1. Review 1 : Informal internal review of individual sections of HLD
2. Review 2 : Publish HLD to external stakeholders
3. Review 3 : Revise HLD Document based on External Stakeholders feedback
4. Review 4: HLD Document Approval

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**Program: MRP-Market Renewal Program**

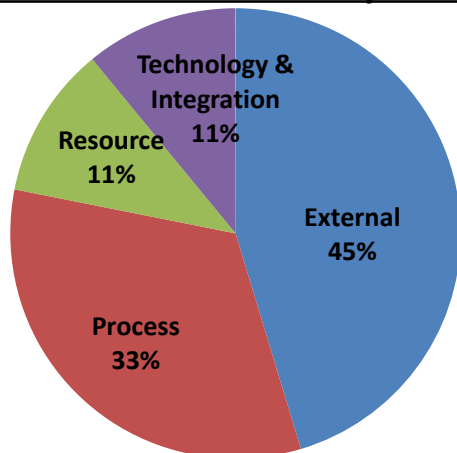
**Monthly Risk Report For MRESC**

*October 31, 2018*

Document Ref. No.: PRG\_MRR07

**Period: Month Ending: 31-Oct-18**

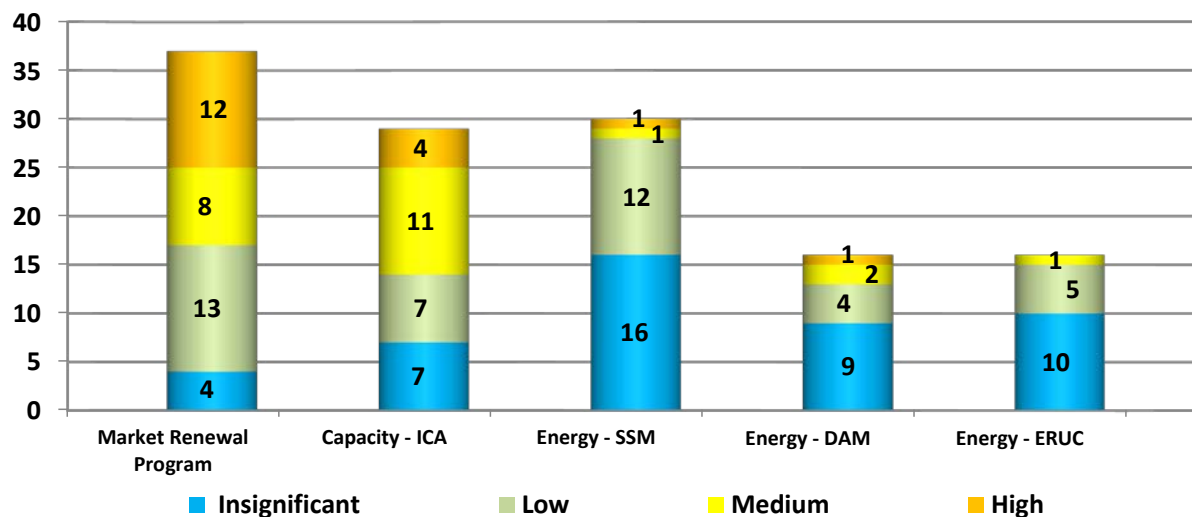
**MRP - Total Residual Risk By Category**



All program and project risks have been categorised into four categories, with the largest category of risks being categories as "External" risks.

**MRP - Total Residual Risk By Project**

Number of Risks



All MRP Risks have been divided into the four projects: SSM, DAM, ERUC and ICA, and Program risks. Each identified risk was assessed with the project team, and the document the risk response tasks that will be implemented proactively to prevent or at least reduce the level of the identified risk. In total we currently have 128 Risks

**MRP RISK SUMMARY - MRESC as of Oct 31, 2018**

**TOP MRP CONTROLABLE RISKS - OPEN**

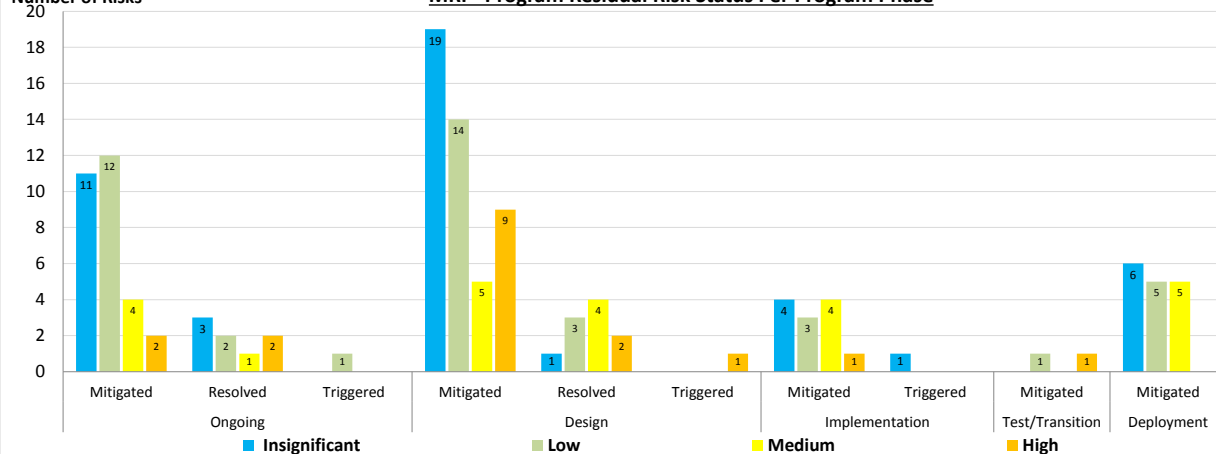
Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R027	Market Renewal Program	Design	External	OEB indicates they are not properly informed about the new market design.	High	Regulatory Affairs is leading all engagement with OEB and keeping Market Strategy group informed of meeting dates/materials. Targeted outreach (ad-hoc CEO updates, quarterly executive team updates, monthly staff updates etc.)	Mitigated	—
MRP_R037	Market Renewal Program	Design	External	New Government adversely impacting MRP scope or schedule	High	Frequent communication with government to ensure alignment as much as possible.	Mitigated	—
ICA_R024	Capacity - ICA	Design	Process	Lack of clarity regarding division of accountability between ICA Team and line of business	High	Engage internal stakeholders regarding roles and responsibilities of line staff vs. the ICA Team	Mitigated	↓
DAM_R012	Energy - DAM	Design	Process	Contracted or rate-regulated participants may be resistive to DAM participation rules and two-settlement outcomes	High	Develop a strategic engagements plan with the SE team	Mitigated	—
DAM_R007	Energy - DAM	Design	Process	Contract negotiations fail to incent sufficient participation to achieve material price convergence between DAM & Real Time	High	Ensure full participants engaging/soliciting on design features to ensure design will incentivize (price certainty, overall lower cost, etc...)	Mitigated	—
MRP_R005	Market Renewal Program	Ongoing	Process	Difficulty reaching agreement with internal stakeholders (Change Management).	High	Operations and IT Leads assigned to reduce the impact as they are representing their respective areas. Director's Forum is setup to facilitate these escalations. Final step for resolution is the MRESC	Mitigated	↓
MRP_R003	Market Renewal Program	Ongoing	Process	Critical interdependencies with other projects (e.g. CRS Replacement)	High	MRP Representation on dependent projects and representation on PSC. MRP leads and BA's to work with dependant projects to identify any impacts during design phase.	Mitigated	—
ICA_R019	Capacity - ICA	Test/Transition	Process	The need for parallel activities on timeline (e.g. market rules with market manuals at technical panel)	High	Start activities as early as possible.	Mitigated	—
MRP_R015	Market Renewal Program	Implementation	Technology & Integration	Design decisions need to be revisited due to technical limitations	High	IT Lead and resources have been introduced early on the program to reduce the likelihood and impact of this occurring. Furthermore software vendors will be part of the HLD.	Mitigated	—

**TOP MRP CONTROLABLE RISKS - RESOLVED**

Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R022	Market Renewal Program	Design	Process	Business Case approvals - approval delays could cause release of Capital expenditure for Detail work on Energy and Capacity work streams	High	Finance has proposed capitalisation expenditure rules that are referencing that the preliminary project stage is completed, and Management, with the relevant authority, implicitly or explicitly authorizes and commits to funding a computer software project. Instead of an approved business case.	Resolved	—

**Number of Risks**

**MRP- Program Residual Risk Status Per Program Phase**



**Updates on KPMG Risk Assessment**

\* Revised PMO Risk Methodology that aligns with ERM model - Completed and to be rolled out within Enterprise change by end Jan 2019.

\*Revising Residual Risk Rating based on revised PMO Risk Methodology (80% completed)

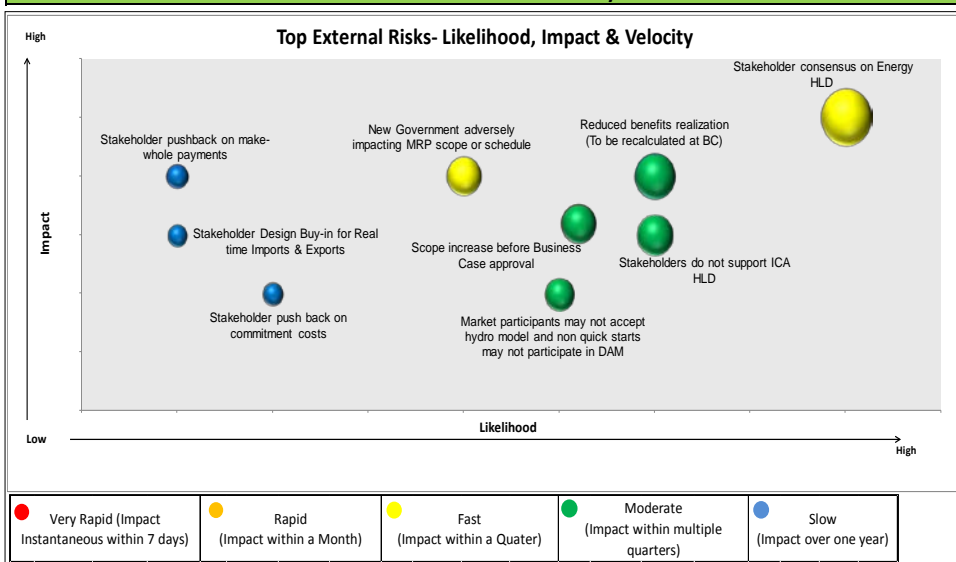
\* Added Risk velocity as measurement for both MRESC and BOD risk report - Completed.

\*Post MRP Risk Interview findings completed. Finding to be presented to MRESC.

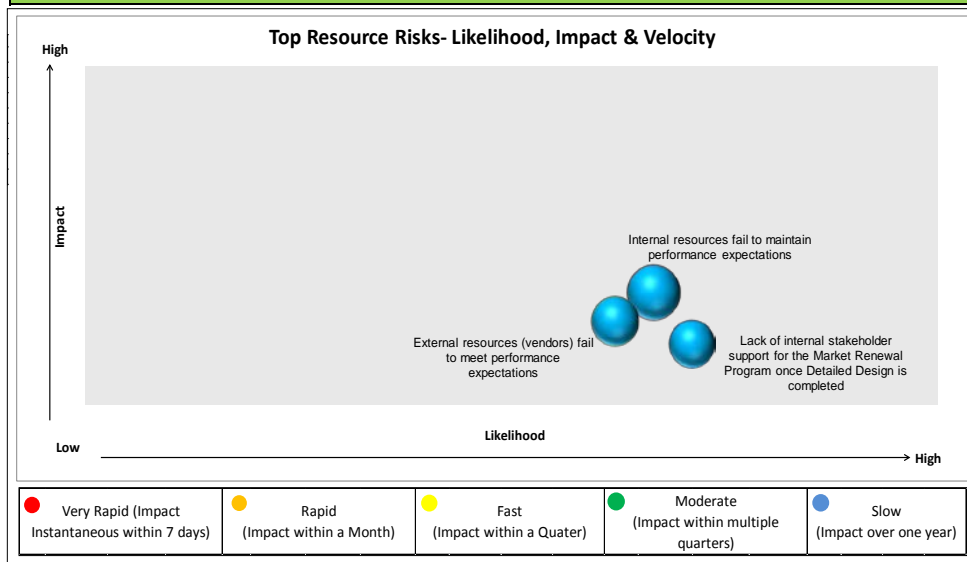
## MRP RISK SUMMARY - MRESC as of Oct 31, 2018

### RISK VELOCITY PER CATEGORY

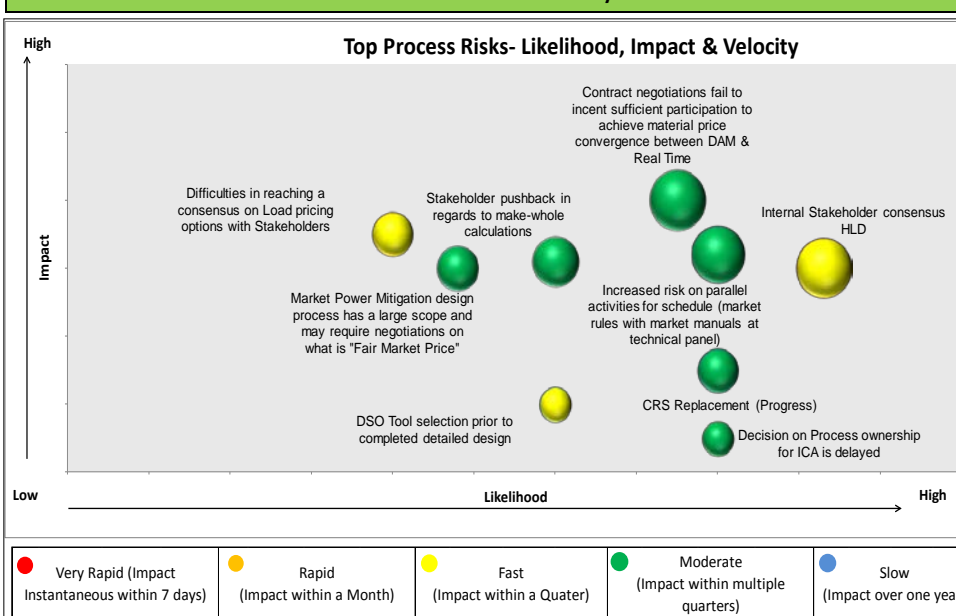
#### External Risks - Risk Velocity



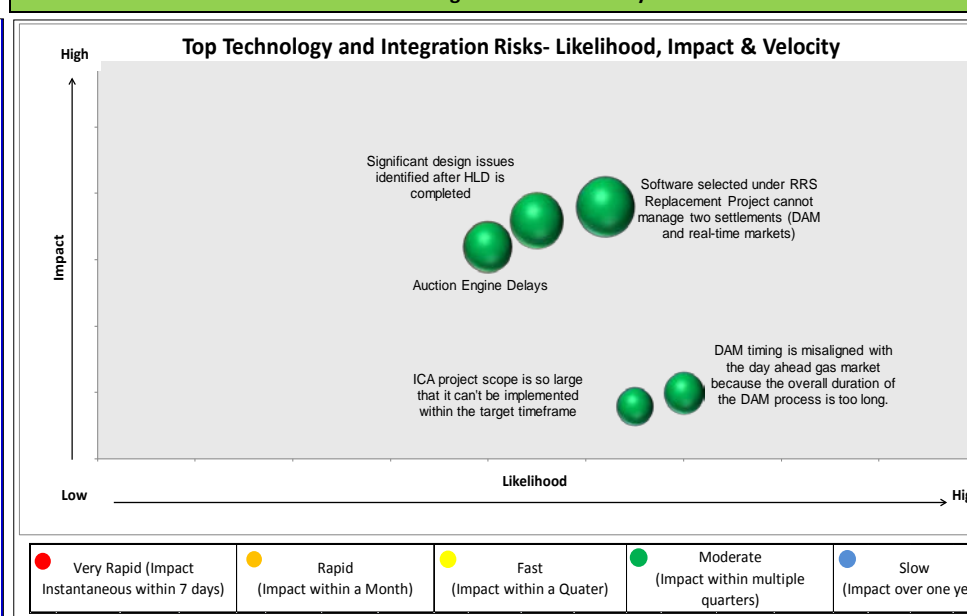
#### Resource Risks - Risk Velocity



#### Process Risks - Risk Velocity



#### IT & Integration - Risk Velocity



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# MARKET RENEWAL PROGRAM DASHBOARD

## Key Summary

### Schedule

The program is overall slightly behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.94. This value is in the Green category. Within the program, the Energy work stream SPI is 0.98 (Green), which is consistent with last month; the Capacity work stream SPI is 0.93 (Green), which is an improvement from last month.

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.02. This value is in the Green category, and corresponds to the SPI being less than 1. The program has not been able to spend the budgeted money on the consultants and resources as planned in the schedule, resulting in an overall underspend against the forecast. The Energy work stream CPI is 1.00 while the Capacity work stream CPI is 1.12.

### Risk

Risk consultant, KPMG, is working jointly with the MRP and Enterprise Risk teams. The PMO Risk Methodology has been revised and now aligns with ERM model. Next steps will be to roll out within Enterprise change by end Jan 2019. Post MRP Risk Interview findings were completed and presented to MRESC.

### Upcoming Milestones

External stakeholder feedback on the High Level Design (HLD) document for Single Schedule Market was due on November 22. The HLD documents for the remaining Energy work stream projects - Day-Ahead Market and Enhanced Real-Time Unit Commitment - will be published for external stakeholder feedback on December 20. The draft HLD for the Incremental Capacity Auction will be circulated for internal stakeholder feedback on December 18.

Schedule, Cost, Risk, and Milestone data as of November 30, 2018.

Prepared: December 6, 2018

MRESC Meeting: December 11, 2018

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**Program: MRP-Market Renewal Program**

Monthly Cost Report  
December 6, 2018

Document Ref. No.: PRG\_MCR11

**Period: Month Ending  
30-Nov-18**

<b>Program Cost Summary:</b>					
	<b>2017 <sup>(1)</sup></b>		<b>2018 <sup>(1)</sup></b>		
	<b>Operating</b>	<b>Capital</b>	<b>Operating</b>	<b>Capital</b>	<b>Total <sup>(5)</sup></b>
<i>Business Plan Approved Costs</i>	9,247		12,700	4,000	16,700
<i>Contingency</i>	2,760				
<b>Business Plan with Contingency</b>	<b>12,007</b>		<b>12,700</b>	<b>4,000</b>	<b>16,700</b>
<i>Forecast</i>	7,972				
<i>2018 Forecast Baseline (end Q1-2018)</i>			17,700	681	18,381
<i>2018 Forecast Rolling <sup>(2)</sup></i>			15,248	1,119	16,367
<i>Contingency <sup>(3)</sup></i>				90	90
<b>Forecast with Contingency</b>	<b>7,972</b>		<b>15,248</b>	<b>1,209</b>	<b>16,457</b>
<i>Variance (2018 Rolling vs Baseline Forecast)</i>			-2,452	527	
<i>Actual Costs <sup>(4)</sup></i>	7,902	201	14,180	1,073	15,253
<i>Contingency</i>					
<b>Actual with Contingency</b>	<b>7,902</b>	<b>201</b>	<b>14,180</b>	<b>1,073</b>	<b>15,253</b>

Notes:

- (1) Report in thousands (000's).
- (2) Includes Q4 Capital Forecast for SSM.
- (3) No contingency for 2018 operating forecasted costs.
- (4) Actual costs for 2018 are YTD.
- (5) Total shows combined operating and capital costs for current year.

## MRP - Operating Financial Summary - 30-Nov-18

The Business Plan Approved Costs for MRP have been divided into the four projects: SSM, DAM, ERUC, and ICA, as well as a general account for tracking costs associated with Program related activities. Each project has been forecasted to reflect the cost expectations for 2018. The actual costs will be tracked against the 2018 baseline forecast.

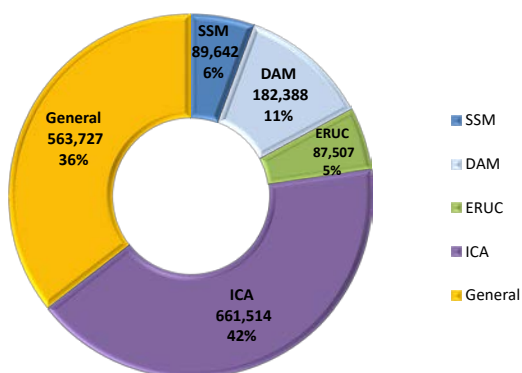
### Variance Summary:

MRP spend for November is 28% below the baseline forecast, with the Year to Date spend being 10% below forecast. The significant variance for SSM is offset by the uptick in Capital spend.

### Overview of MRP Monthly Costs: 30-Nov-18

MRP Operating Costs													
Monthly								Year to Date					
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 30-Nov-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$219,849	\$455,187	\$89,642	(\$365,545)	(80%)	Below Forecast		\$2,496,592	\$2,653,076	\$1,995,717	(\$657,359)	(25%)	Below Forecast
DAM	\$72,845	\$102,500	\$182,388	\$79,888	78%	Above Forecast		\$844,423	\$1,183,142	\$1,623,959	\$440,817	37%	Above Forecast
ERUC	\$72,845	\$102,050	\$87,507	(\$14,543)	(14%)	Below Forecast		\$844,423	\$1,054,713	\$953,915	(\$100,798)	(10%)	Below Forecast
ICA	\$286,172	\$782,720	\$661,514	(\$121,206)	(15%)	Below Forecast		\$3,234,945	\$5,080,161	\$4,855,465	(\$224,696)	(4%)	Below Forecast
General	\$378,472	\$744,240	\$563,727	(\$180,513)	(24%)	Below Forecast		\$4,249,447	\$5,830,984	\$4,750,854	(\$1,080,131)	(19%)	Below Forecast
Total Program	\$1,030,184	\$2,186,697	\$1,584,778	(\$601,919)	(28%)	Below Forecast		\$11,669,828	\$15,802,076	\$14,179,910	(\$1,622,166)	(10%)	Below Forecast

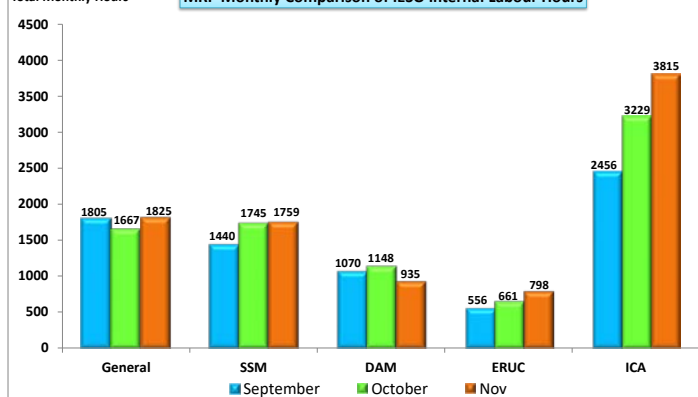
Monthly Actual Costs by Project



Notes:- The above graph reflects MRP actual cost allocation per projects and percentage. The monthly cost split reflect the Energy workstreams winding down on HLD, and a ramping up of effort in the Capacity workstream. The General account remains relatively unchanged at 36%.

Total Monthly Hours

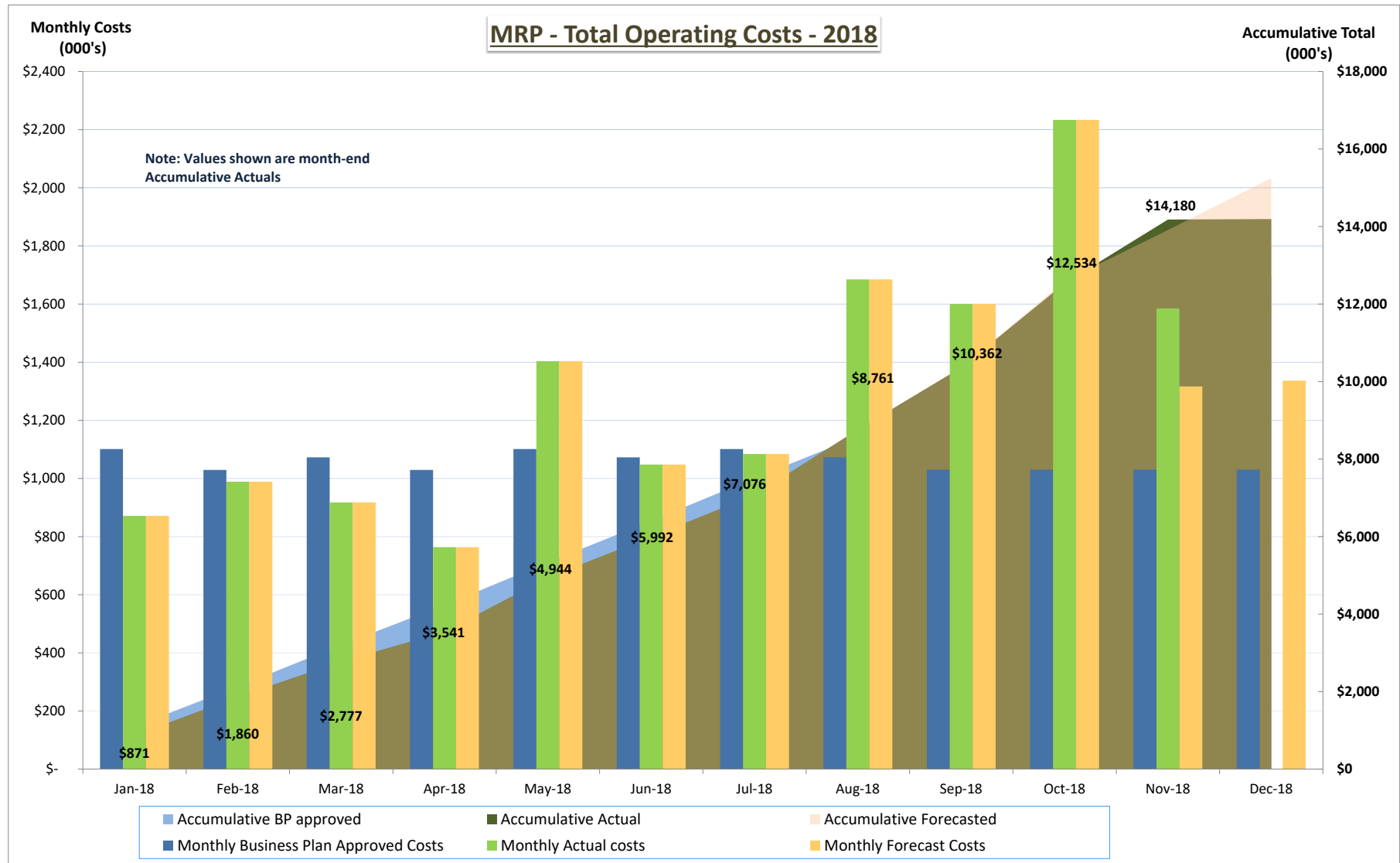
MRP Monthly Comparison of IESO Internal Labour Hours



Notes:- The November hours align with expectations across the program.

MRP Monthly Comparison - 2018 Operating Actuals

Project	Jan	Feb	Mar	Apr	May	June	July	August	September	October	November	YTD
SSM	69,769	88,106	83,920	151,393	221,896	177,132	148,711	276,328	225,429	463,391	89,642	1,995,717
DAM	105,936	112,941	92,211	87,294	182,775	141,457	135,882	146,652	184,686	251,737	182,388	1,623,959
ERUC	72,792	80,158	97,317	55,286	86,282	84,620	94,655	89,796	68,677	136,826	87,507	953,915
ICA	358,104	272,219	234,502	167,162	494,585	296,332	320,248	591,595	555,445	903,760	661,514	4,855,465
General	264,630	435,358	409,454	302,561	417,810	348,220	384,726	580,442	566,226	477,701	563,727	4,750,854
<b>Total</b>	<b>871,230</b>	<b>988,782</b>	<b>917,404</b>	<b>763,695</b>	<b>1,403,349</b>	<b>1,047,761</b>	<b>1,084,222</b>	<b>1,684,812</b>	<b>1,600,462</b>	<b>2,233,415</b>	<b>1,584,778</b>	<b>14,179,910</b>



Notes:- The above graph compares monthly actuals against a monthly rolling forecast.

## MRP - Capital Financial Summary - 30-Nov-18

The capital costs approved under the 2018 Approved Business Plan is to capture the costs of detailed design work projected for 2018 as well as the costs for relocating the MRP team to our UMR location.

### Variance Summary:

Capital Spend YTD reflects delay in delivery of AV Equipment for the meeting rooms at UMR. As expected the monitors for the AV equipment were delivered in September, with video conferencing equipment expected to be installed by the end of November.

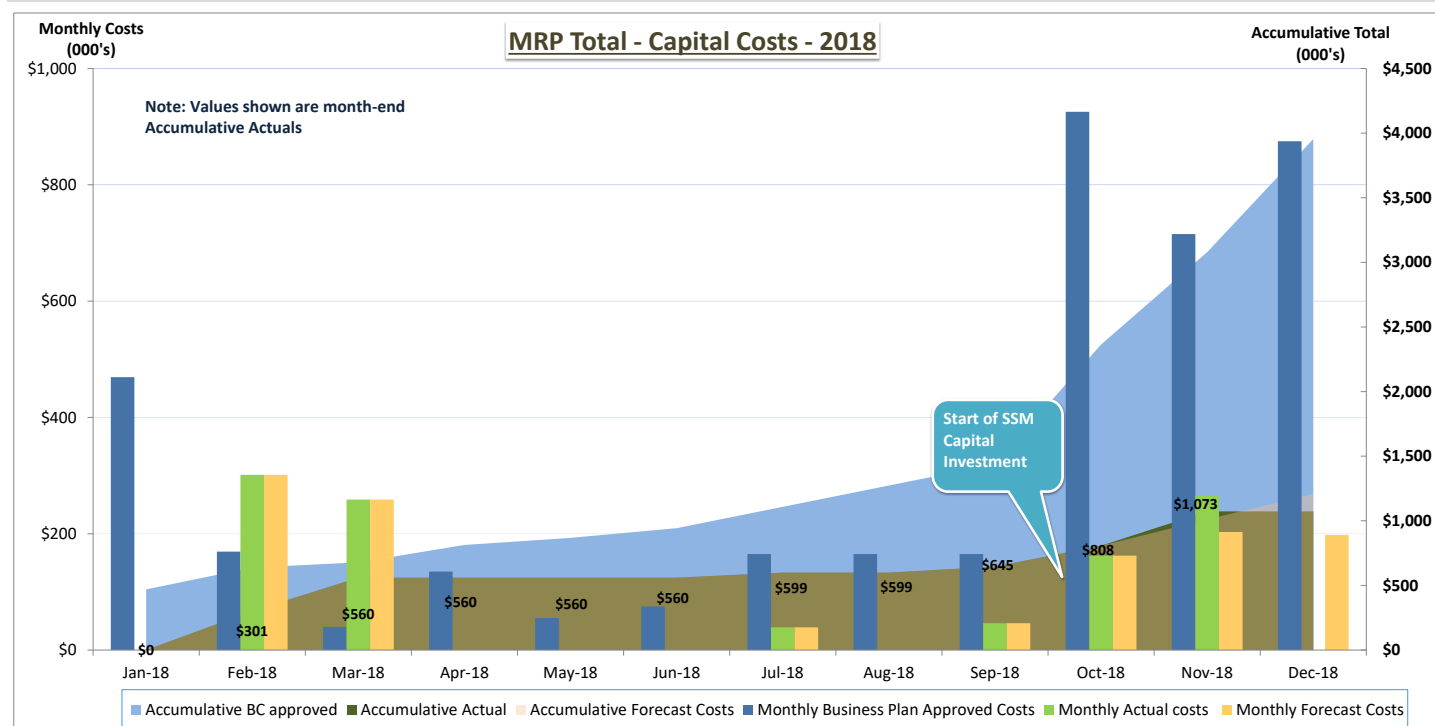
### Notable Improvements:

The majority of the AV equipment were installed in October with the final installation of the video conferencing equipment expected in December.

## Overview of MRP Monthly Costs:

30-Nov-18

MRP Capital Costs								Year to Date					
Monthly													
Project Name	Business Plan Approved Costs	2018 Forecast Baseline	Actual	Variance Actual vs Forecast	Variance %	Status for 30-Nov-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Baseline	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$262,490	\$ -	\$265,192	\$265,192	-	Above Forecast		\$731,225		\$420,033	\$420,033	-	Above Forecast
General - UMR	\$130,134.00	\$ -		\$0	-	Above Forecast		\$1,096,094	\$771,297	\$652,830	(\$118,467)	(15%)	Below Forecast
<b>Total Program</b>	<b>\$392,624.00</b>	<b>\$ -</b>	<b>\$265,192</b>	<b>\$265,192</b>	<b>-</b>	<b>Above Forecast</b>		<b>\$1,827,319</b>	<b>\$771,297</b>	<b>\$1,072,863</b>	<b>\$301,566</b>	<b>39%</b>	<b>Below Forecast</b>



Notes:- The graph reflects the initial expectations stated in the approved business plan with capital budget of \$4M and with detailed designs beginning in Q4 2018. November's Capital costs consists of internal labour costs and contract services.

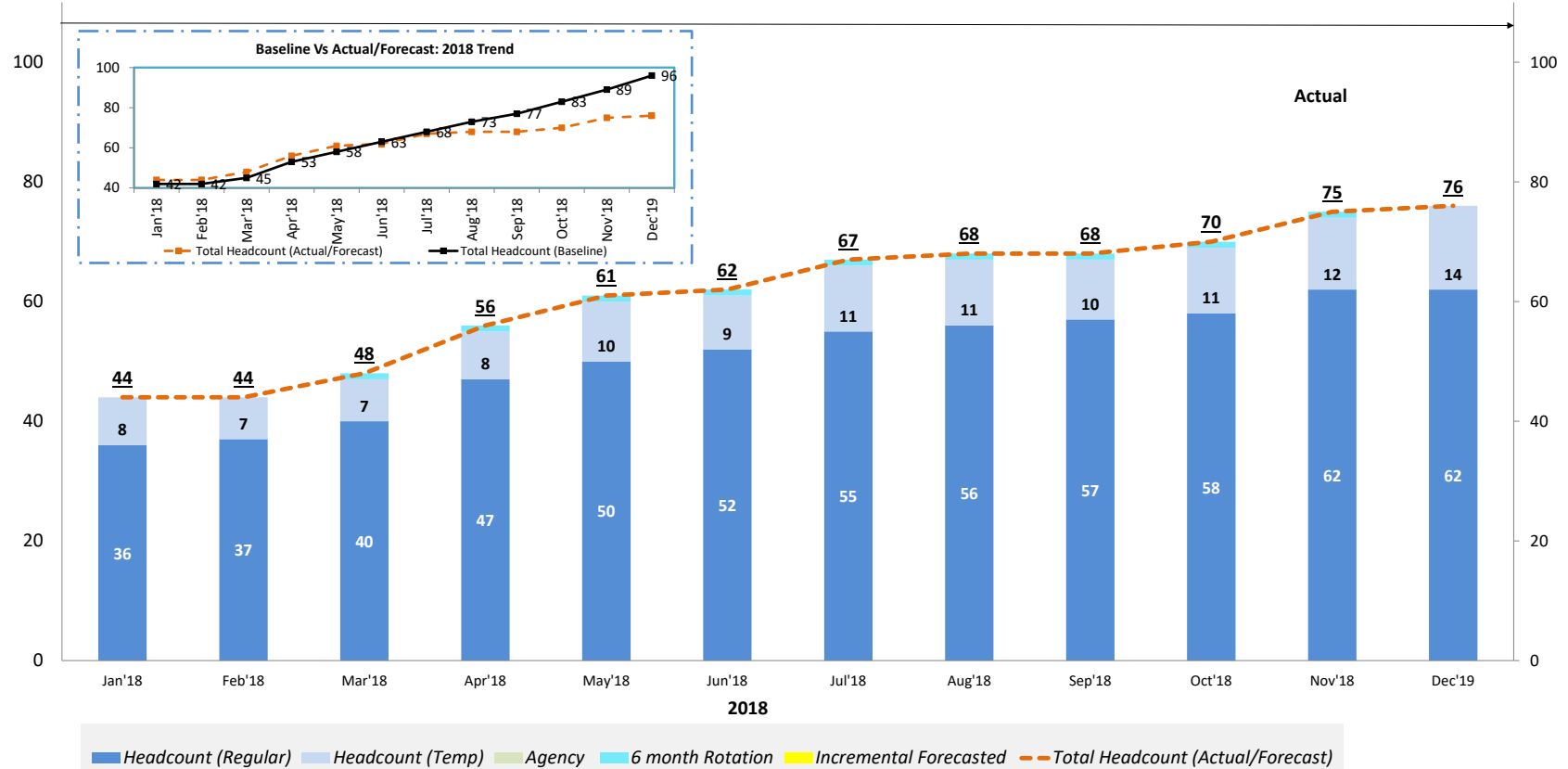
MRP Monthly Comparison - 2018 Capital Actuals												
Project	Jan	Feb	Mar	Apr	May	June	July	August	September	October	November	YTD
SSM	-	-	-	-	-	-	-	-	-	154,841	265,192	420,033
General - UMR Relocation	-	301,297	258,848	-	-	-	39,022	-	46,105	7,558	-	652,830
Total	-	301,297	258,848	-	-	-	39,022	-	46,105	162,399	265,192	1,072,863



Monthly Headcount

**MRP Monthly and Accumulative Headcount - 2018**

Accumulative Headcount



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**Program: MRP-Market Renewal Program**

**Project: Total MRP Program**

**Monthly Schedule Report for MRESC**  
*November 30, 2018*

**Document Ref. No.: MRP\_MSR09\_18-11-30**  
**(MSR ~ 09)**

**Project Commencement Reporting Date: Jan 1, 2018**  
**Project Completion Reporting Date: Dec 31, 2018**

Reporting Range Period	From <i>January 1, 2018</i>	<<<<<	>>>>>	To <i>November 30, 2018</i>
------------------------	--------------------------------	-------	-------	--------------------------------

For Week ending	<i>November 30, 2018</i>
-----------------	--------------------------

Reporting Date	<i>December 7, 2018</i>
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**Program Schedule Status**

Schedule Baseline	Cumulative Planned %	Cumulative Actual %	Variation %	Schedule Variance <sup>(1)</sup>
	93.6%	88.2%	5.4%	Under Threshold

**Month End Project Performance Status**

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	\$16,564,054	\$15,616,676	0.94	Behind Schedule
Cost Performance	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	\$15,252,803	\$15,616,676	1.02	Under Budget

**Legend for Status:**

(1). Threshold upper limit: assumption is -10%, If variation exceed (-10%) threshold limit schedule to be revised

(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule" or if SPI=1 "On Schedule"

(3). Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"

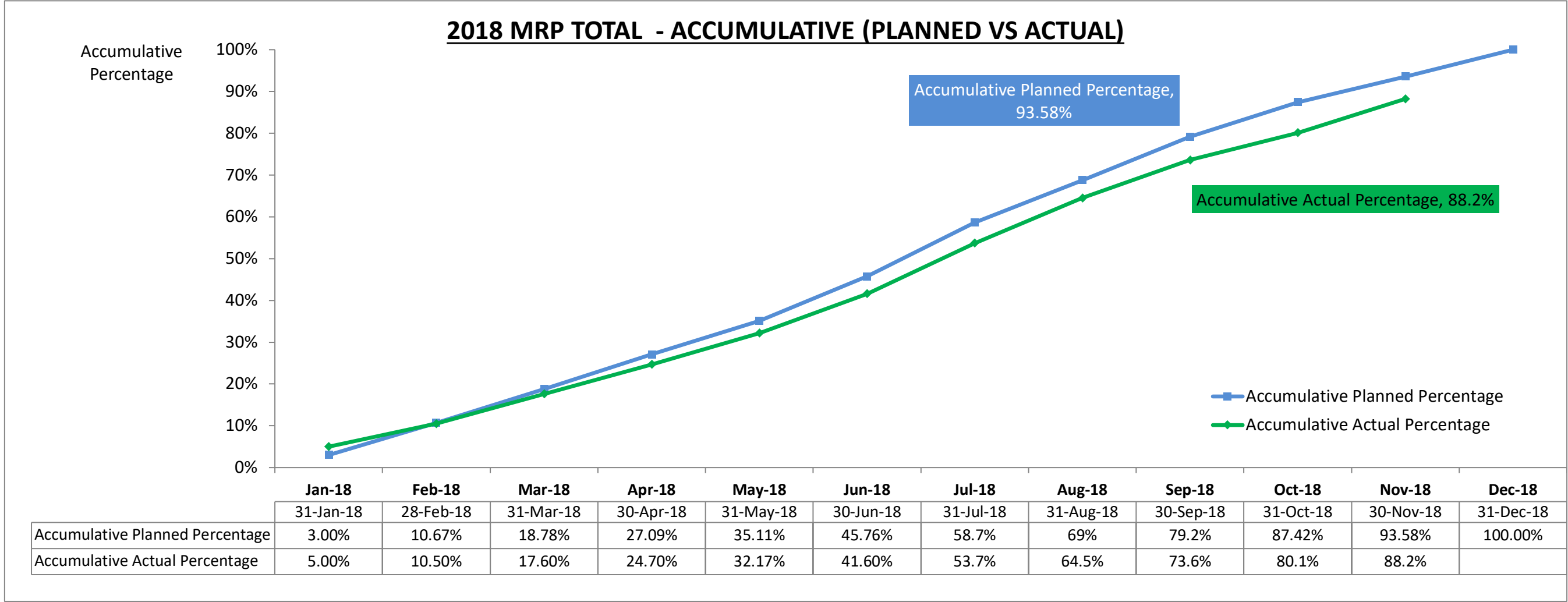
Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.



Monthly Status as of: 30-Nov-18

PROGRESS INDICATORS								
MRP	2018 Total Forecast at Completion (BAC) <sup>(1)</sup>	2018 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed
SSM	\$2,943,020	\$2,415,750	16.6%	01-Jan-18	31-Dec-18	82.00%	80.33%	13.4%
DAM	\$1,285,642	\$1,623,959	7.3%	01-Jan-18	31-Dec-18	92.19%	90.64%	6.6%
ERUC	\$1,156,763	\$953,915	6.5%	01-Jan-18	31-Dec-18	92.20%	90.74%	5.9%
ICA	\$6,069,638	\$4,855,465	34.3%	01-Jan-18	31-Dec-18	96.24%	89.25%	30.6%
GENERAL	\$6,244,937	\$5,403,714	35.3%	01-Jan-18	31-Dec-18	97.00%	90.00%	31.8%
MRP Total	\$17,700,000	\$15,252,803	100%			93.6%		88.2%

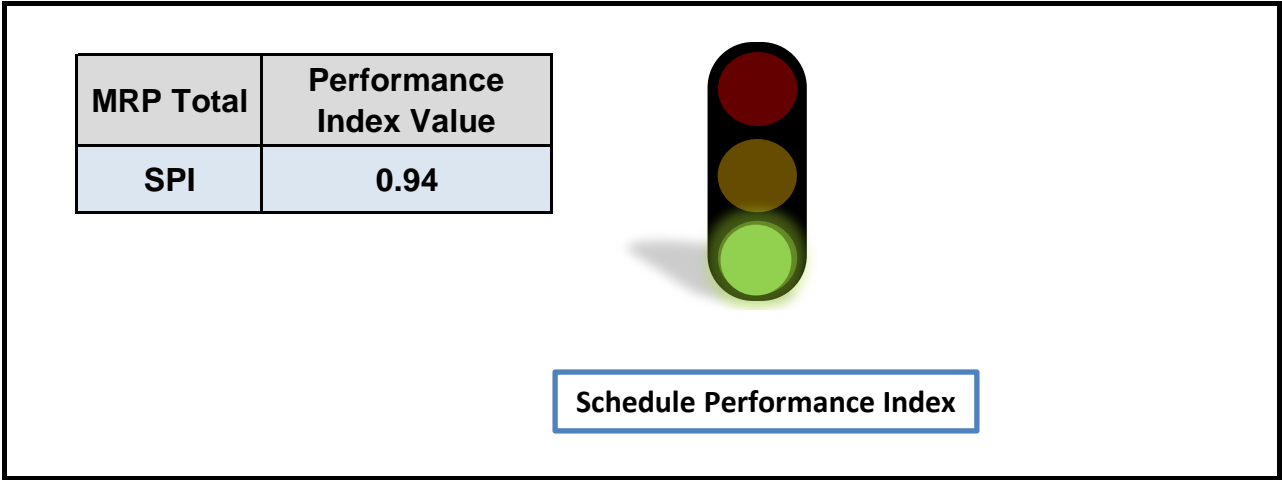
PERFORMANCE INDICATORS			
Earned Value (EV) <small>(BAC X Monthly Scheduled Actual Progress)</small>	Planned Value (PV) <small>(BAC X Monthly Scheduled Planned %)</small>	CPI (EV/AC)	SPI (EV/PV)
\$2,364,128	\$2,413,276	0.98	0.98
\$1,165,306	\$1,185,233	0.72	0.98
\$1,049,647	\$1,066,535	1.10	0.98
\$5,417,152	\$5,841,420	1.12	0.93
\$5,620,443	\$6,057,589	1.04	0.93
\$15,616,676	\$16,564,054	1.02	0.94



Notes (1) 2018 Forecast values and not Budget values will be used.  
(2) Overall Schedule Variance for MRP Total is -5.4%

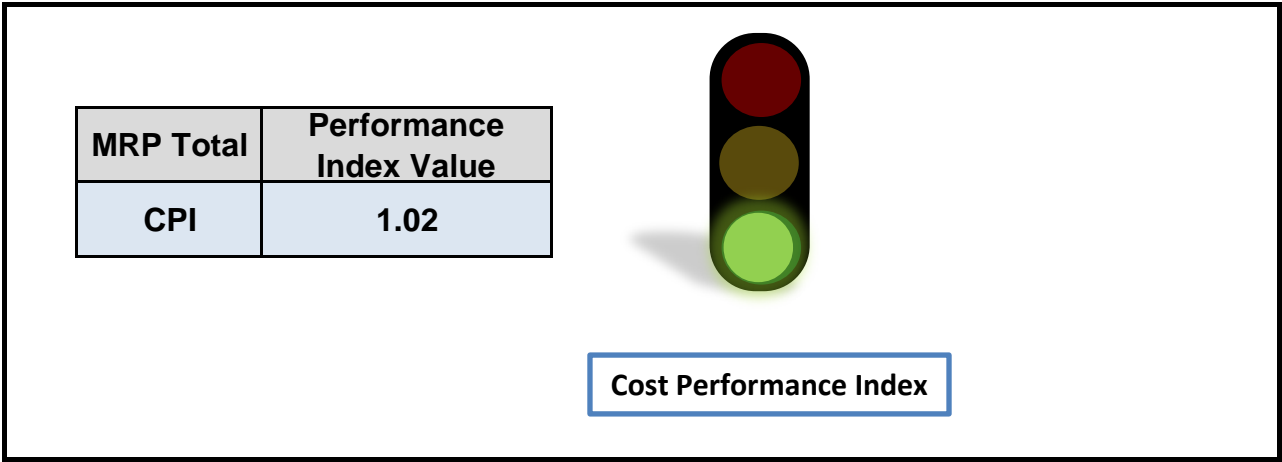


Monthly Performance Status: 30-Nov-18

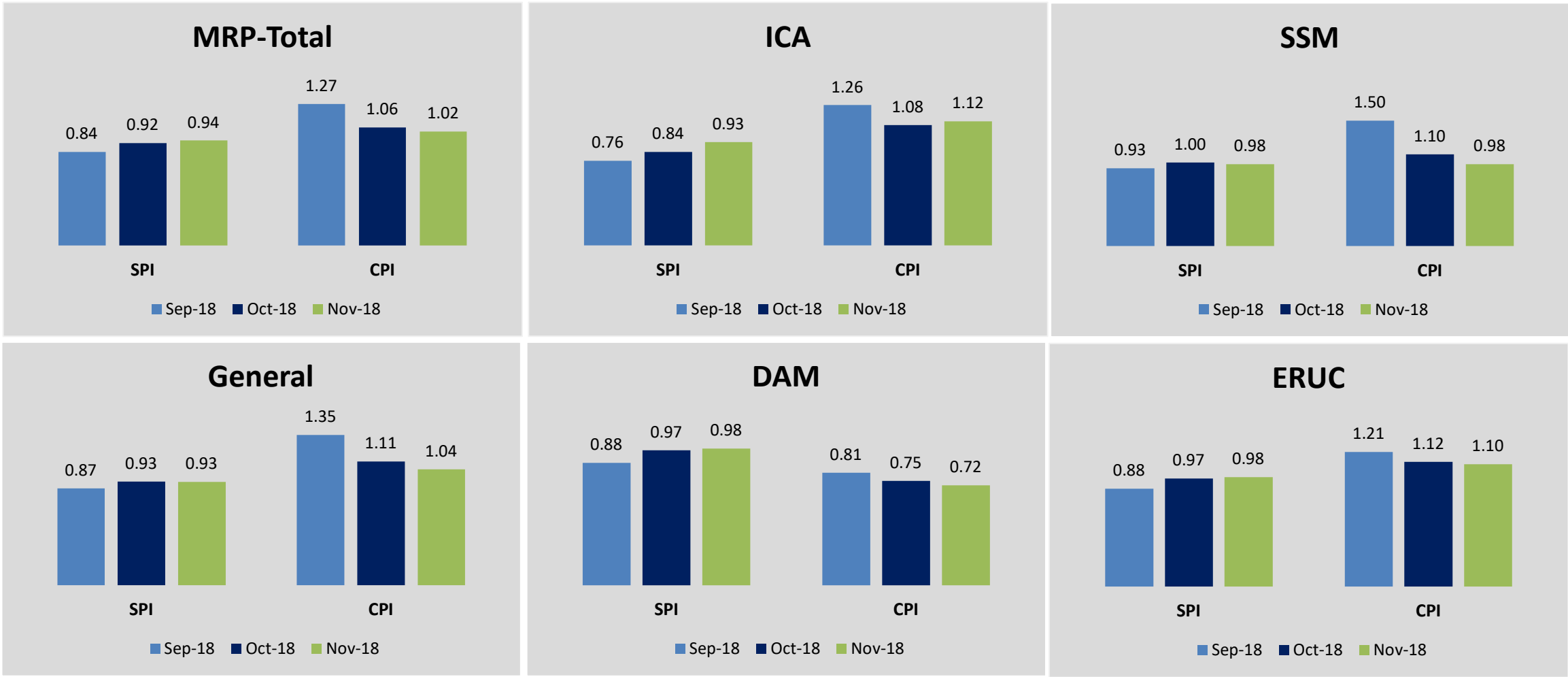


Threshold limits

Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9



Three Month Rolling Performance Comparison 30-Nov-18



**PMI Definitions:**

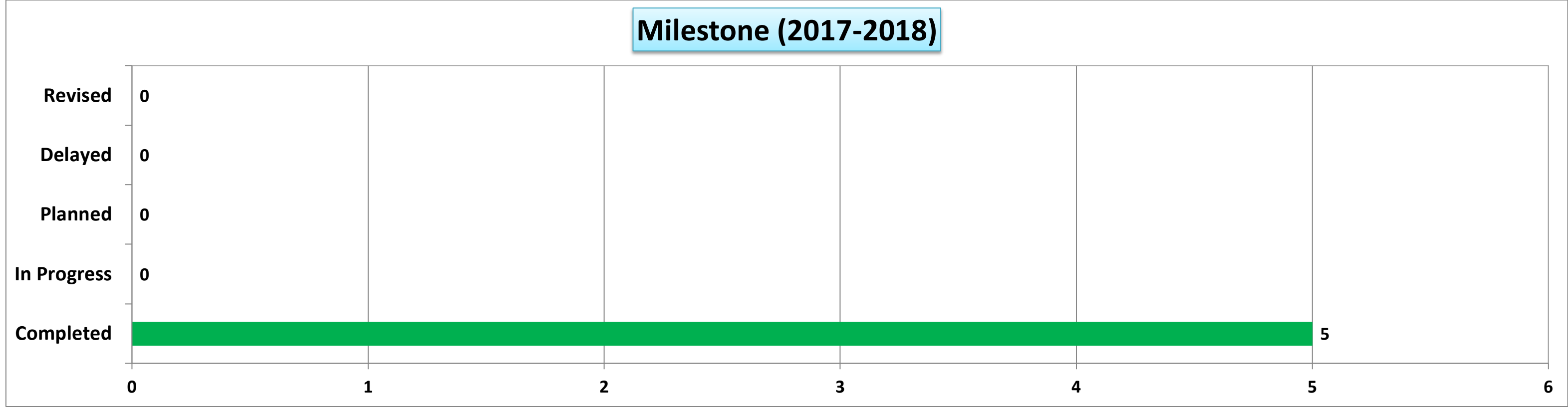
**CPI (Cost Performance Index)**  
The cost performance index (**CPI**) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

**SPI (Schedule Performance Index)**  
Schedule performance index (**SPI**) is a ratio of the earned value (EV) to the planned value (PV). **SPI** = EV ÷ PV. If the **SPI** is less than one, it indicates that the **project** is potentially behind schedule to-date whereas an **SPI** greater than one, indicates the **project** is running ahead of schedule



SSM-Project Milestone Status30-Nov-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision- Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	28-Sep-18	28-Sep-18	27-Sep-18	27-Sep-18	Completed	



SSM-Design Elements Progress30-Nov-18

S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 2: Energy Ref Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
2	DE 1: Energy Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
3	DE 3: Energy Ref Price loss Component	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
4	DE 6: Supplier Pricing	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
5	DE 7: Operating Reserve Reference Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
6	DE 8: Reserve Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
7	DE 11: Multi-interval optimization (MIO) pricing run and ramp rate Multiplier	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
8	DE4: Pre or Post interval pricing	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
9	DE 5: Intertie Congestion Price	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
10	DE 9: Resolving Constraint Violations	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
11	DE 12: Pricing setting Eligibility for Resources	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
12	DE 10: Out of Market Operator Actions	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
13	DE 18: Make Whole Payment	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
14	DE 19: Uplift Recovery	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
15	DE 13: Mitigation Process	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
16	DE 14: Timing of Application	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
17	DE:15 Reference Levels	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
18	DE 16: Pricing for Loads	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		
19	DE 17: Congestion Rents & Loss residuals	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress		

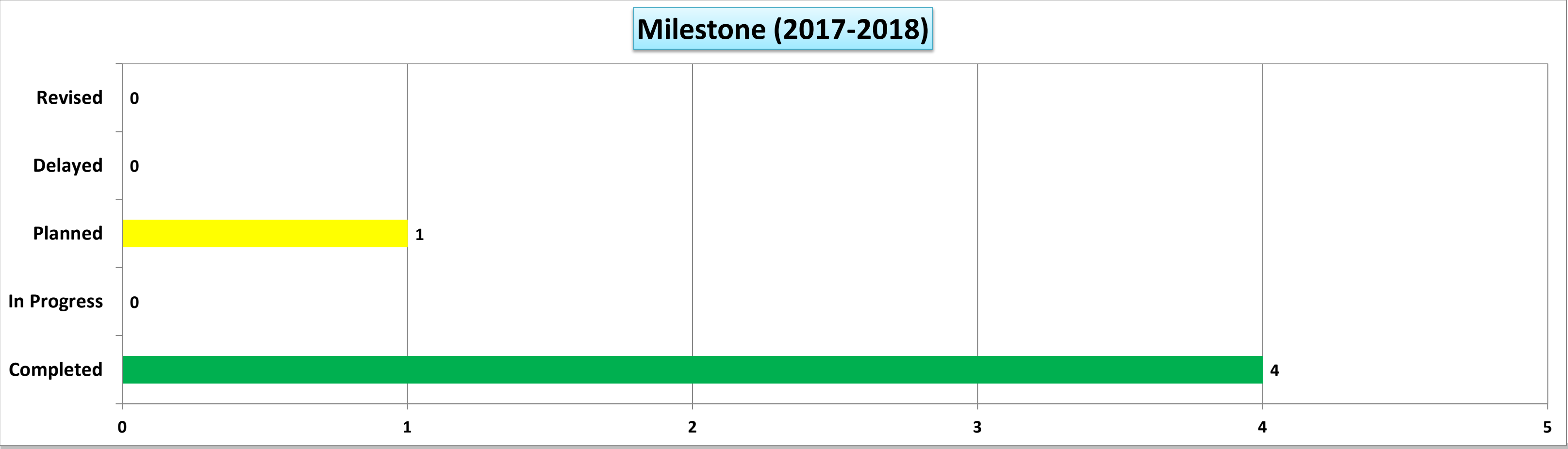
- Notes:
- 1. Review 1 : Includes internal review of all design elements in three different parts
  - 2. Review 2 : Internal review of HLD (all three parts combined)
  - 3. Review 3 : Publish HLD to external stakeholders
  - 4. Review 4: Incorporate comments on HLD from external Stakeholders
  - 5. Review 5: HLD Approval





DAM-Project Milestone Status 30-Nov-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	19-Jul-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	



DAM-Design Elements Progress 30-Nov-18

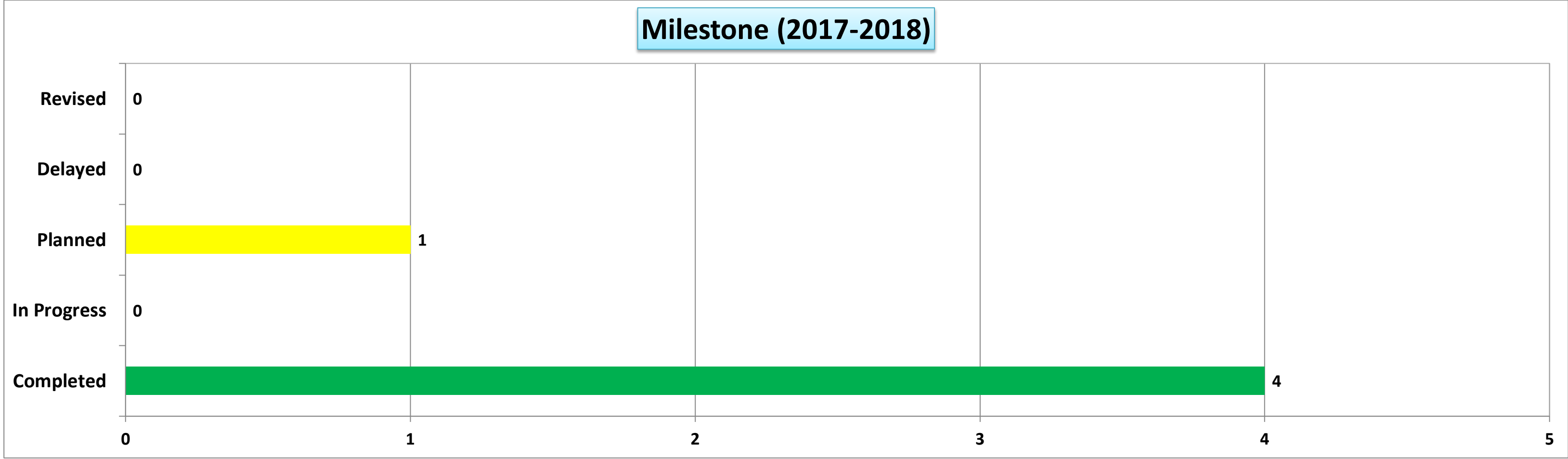
S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Offer Obligations (formerly Reference Quantity)	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
2	DE 4: Reliability Input Parameters	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
3	DE 6: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
4	DE 8: Submission and Posting Deadlines	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
5	DE 9: Initiation of Operational Commitments	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
6	DE 11: Price Setting Eligibility	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
7	DE 12: Reporting Obligations	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
8	DE 14: Two Settlement for Supply	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
9	DE 16: Uplift Recovery	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
10	DE 3: Supply Participation: Variable Generation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
11	DE 17: Financial Transmission Rights	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
12	DE 18: Market System Failures	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
13	DE 2: Load Participation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
14	DE 5: Virtual Transactions	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
15	DE 7: Optimizattion Energy Limited Resources	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
16	DE 15: Make Whole Payments	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
17	DE10: Market Power Mitigation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
18	DE 13: Two Settlement for Load	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			

- Notes:
- 1. Review 1 : Includes internal review of all design elements in three different parts
  - 2. Review 2 : Internal review of HLD (all three parts combined)
  - 3. Review 3 : Publish HLD to external stakeholders
  - 4. Review 4: Incorporate comments on HLD from external Stakeholders
  - 5. Review 5: HLD Approval



ERUC-Project Milestone Status30-Nov-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18			Planned	



ERUC-Design Elements Progress30-Nov-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Functional Passes	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
2	DE 2: Look Ahead Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
3	DE 3: Timing and Frequency of Run	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
4	DE 4: Time Step	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
5	DE 5: Intertie Transactions	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
6	DE 6: Must Offer Requirements	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
7	DE 7: Eligibility for Make-whole	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
8	DE 8: Market Participant Data	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
9	DE 9: Commitment Cost Mitigation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
10	DE10: Offer Changes	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
11	DE 11: Binding Start-up Instruction and Operational Constraint	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
12	DE 12: Calculation of Make Whole Payment	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			
13	DE 13: Failure Charge	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Not Started			

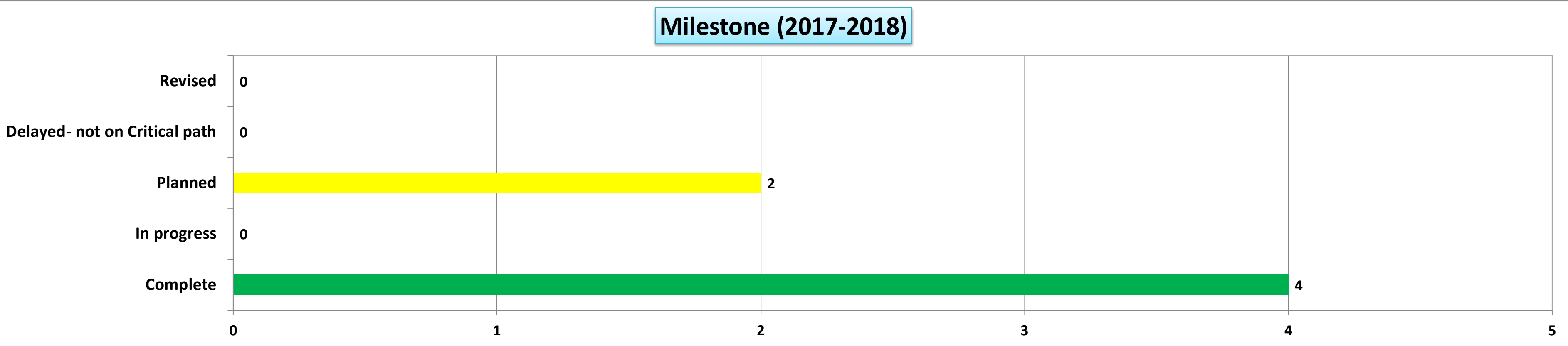
- Notes:
- 1. Review 1 : Includes internal review of all design elements in three different parts
  - 2. Review 2 : Internal review of HLD (all three parts combined)
  - 3. Review 3 : Publish HLD to external stakeholders
  - 4. Review 4: Incorporate comments on HLD from external Stakeholders
  - 5. Review 5: HLD Approval



ICA-Project Milestone Status

30-Nov-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	18-May-17	20-Jul-17	18-May-17	20-Jul-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations-Phase 2	16-Aug-17	17-Apr-18	16-Aug-17	14-Jun-18	Completed	
4	RFP for Auction Engine	19-Dec-18	4-Dec-19			Planned	RFI Completed, RFP Process reforecasted based on ICA priorities, Scheduled for Q1 2019
5	Stakeholder Engagement- Design Decision Presented	12-Sep-18	19-Oct-18			Completed	
6	Publish HLD internally for review 1	19-Dec-18	1-Feb-19			Planned	



ICA-Design Elements Progress

30-Nov-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
										Internal	External Stakeholders	Internal	Approval
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft HLD Templates	6. Draft HLD Contents	7. Review 1	8. Review 2	9. Review 3	10. Review 4
1	DE 1: Participation Requirement	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
2	DE 2: Resource Eligibility	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
3	DE 3: Qualified Capacity	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
4	DE 4: Market Power Mitigation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
5	DE 5: Length of Forward Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
6	DE 6: Commitment Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
7	DE 7: Multi-Year Commitments	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	Planned			
8	DE 8: Locational Considerations	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
9	DE 9: Slope of Demand Curve	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	Planned			
10	DE 10: Target Capacity	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
11	DE 11: Min/Max Capacity Limits	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	Planned			
12	DE 12: Net Cost of New Entry	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	Planned			
13	DE 13: Max Auction Clearing Price	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	Planned			
14	DE 14: Rebalancing Auctions	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
15	DE 15: Resource Obligations (within forward period)	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
16	DE 16: Non-Performance Implications (within forward period)	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
17	DE 17: Resource Performance Obligations	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
18	DE 18: Performance Assessment	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
19	DE 19: Cost Recovery	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			
20	DE 20: Auction Mechanics	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	Planned			
21	DE 21: Settlements	10	6	Completed	Completed	Completed	Completed	Completed	Completed	Planned			

Notes:

- 1. Review 1 :Informal internal review of individual sections of HLD
- 2. Review 2 : Publish HLD to external stakeholders
- 3. Review 3 : Revise HLD Document based on External Stakeholders feedback
- 4. Review 4: HLD Document Approval

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**Program: MRP-Market Renewal Program**

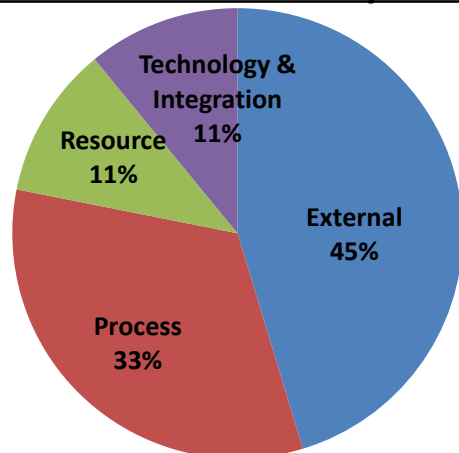
**Monthly Risk Report For MRESC**

*November 30, 2018*

Document Ref. No.: PRG\_MRR07

**Period: Month Ending: 30-Nov-18**

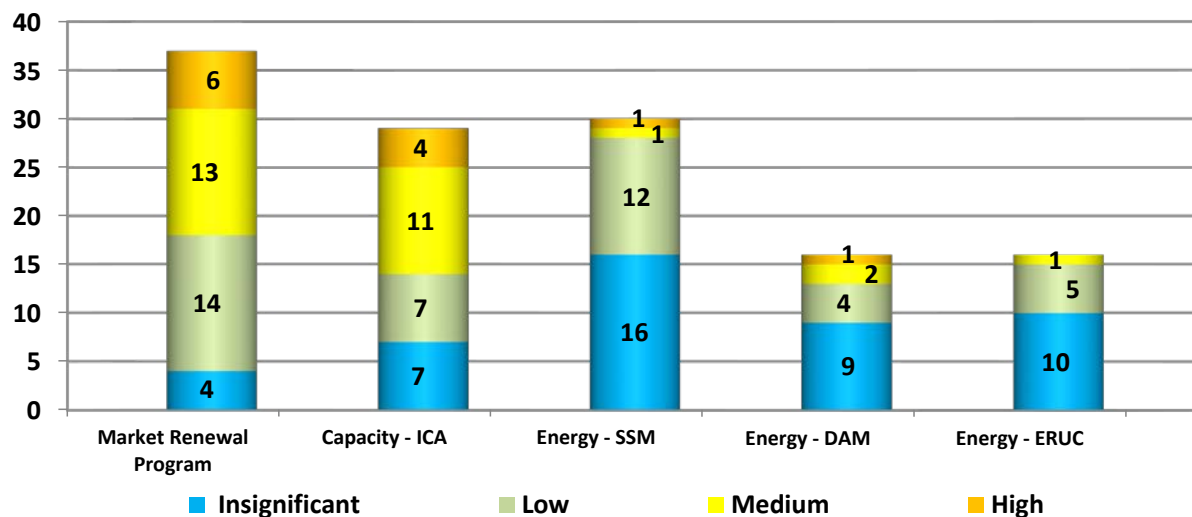
**MRP - Total Residual Risk By Category**



All program and project risks have been categorised into four categories, with the largest category of risks being categories as "External" risks.

**MRP - Total Residual Risk By Project**

Number of Risks



All MRP Risks have been divided into the four projects: SSM, DAM, ERUC and ICA, and Program risks. Each identified risk was assessed with the project team, and the document the risk response tasks that will be implemented proactively to prevent or at least reduce the level of the identified risk. In total we currently have 128 Risks

**MRP RISK SUMMARY - MRESC as of Nov 30, 2018**

**TOP MRP CONTROLABLE RISKS - OPEN**

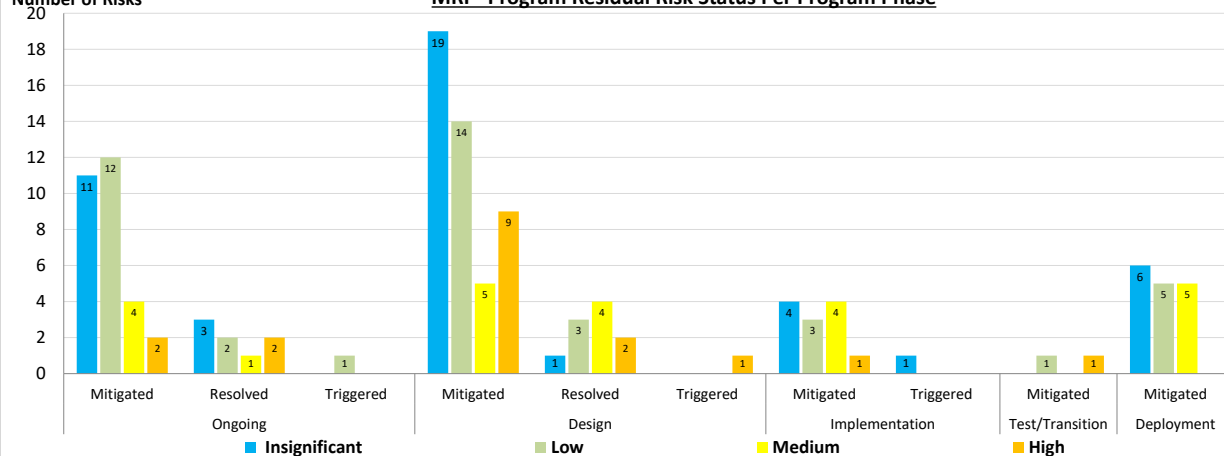
Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R027	Market Renewal Program	Design	External	OEB indicates they are not properly informed about the new market design.	High	Regulatory Affairs is leading all engagement with OEB and keeping Market Strategy group informed of meeting dates/materials. Targeted outreach (ad-hoc CEO updates, quarterly executive team updates, monthly staff updates etc.)	Mitigated	—
MRP_R037	Market Renewal Program	Design	External	New Government adversely impacting MRP scope or schedule	High	Frequent communication with government to ensure alignment as much as possible.	Mitigated	—
ICA_R024	Capacity - ICA	Design	Process	Lack of clarity regarding division of accountability between ICA Team and line of business	High	Engage internal stakeholders regarding roles and responsibilities of line staff vs. the ICA Team	Mitigated	↓
DAM_R012	Energy - DAM	Design	Process	Contracted or rate-regulated participants may be resistive to DAM participation rules and two-settlement outcomes	High	Develop a strategic engagements plan with the SE team	Mitigated	—
DAM_R007	Energy - DAM	Design	Process	Contract negotiations fail to incent sufficient participation to achieve material price convergence between DAM & Real Time	High	Ensure full participants engaging/soliciting on design features to ensure design will incentivize (price certainty, overall lower cost, etc...)	Mitigated	—
MRP_R005	Market Renewal Program	Ongoing	Process	Difficulty reaching agreement with internal stakeholders (Change Management).	High	Operations and IT Leads assigned to reduce the impact as they are representing their respective areas. Director's Forum is setup to facilitate these escalations. Final step for resolution is the MRESC	Mitigated	↓
MRP_R003	Market Renewal Program	Ongoing	Process	Critical interdependencies with other projects (e.g. CRS Replacement)	High	MRP Representation on dependent projects and representation on PSC. MRP leads and BA's to work with dependant projects to identify any impacts during design phase.	Mitigated	—
ICA_R019	Capacity - ICA	Test/Transition	Process	The need for parallel activities on timeline (e.g. market rules with market manuals at technical panel)	High	Start activities as early as possible.	Mitigated	—
MRP_R015	Market Renewal Program	Implementation	Technology & Integration	Design decisions need to be revisited due to technical limitations	High	IT Lead and resources have been introduced early on the program to reduce the likelihood and impact of this occurring. Furthermore software vendors will be part of the HLD.	Mitigated	—

**TOP MRP CONTROLABLE RISKS - RESOLVED**

Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R022	Market Renewal Program	Design	Process	Business Case approvals - approval delays could cause release of Capital expenditure for Detail work on Energy and Capacity work streams	High	Finance has proposed capitalisation expenditure rules that are referencing that the preliminary project stage is completed, and Management, with the relevant authority, implicitly or explicitly authorizes and commits to funding a computer software project. Instead of an approved business case.	Resolved	—

**Number of Risks**

**MRP- Program Residual Risk Status Per Program Phase**



**Updates on KPMG Risk Assessment**

\* Revised PMO Risk Methodology that aligns with ERM model - Completed and to be rolled out within Enterprise change by end Jan 2019.

\*Revising Residual Risk Rating based on revised PMO Risk Methodology - completed.

\* Added Risk velocity as measurement for both MRESC and BOD risk report - Completed.

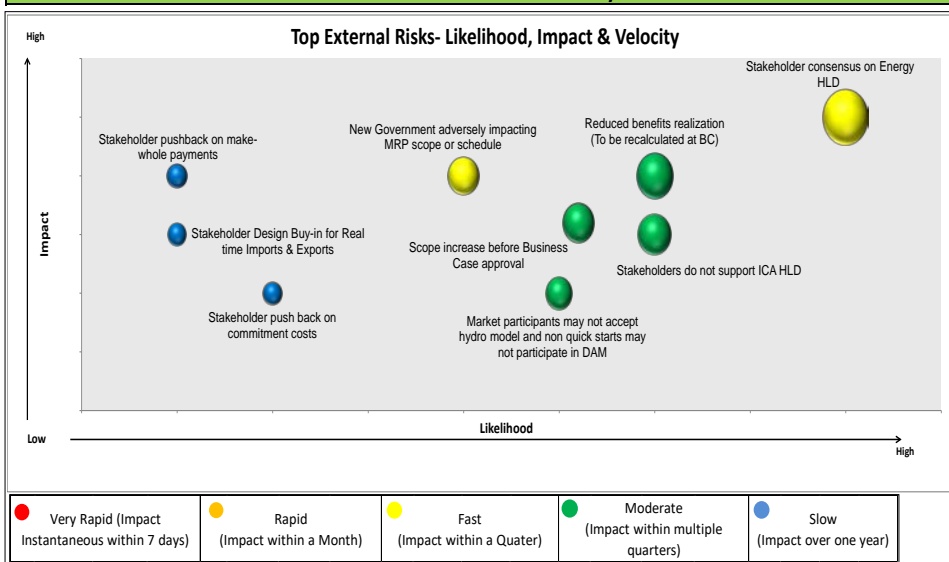
\*Post MRP Risk Interview findings completed. Finding to be presented to MRESC - Completed.

\*IESO/MRP Risk Interviews round two - (In progress - 50%)

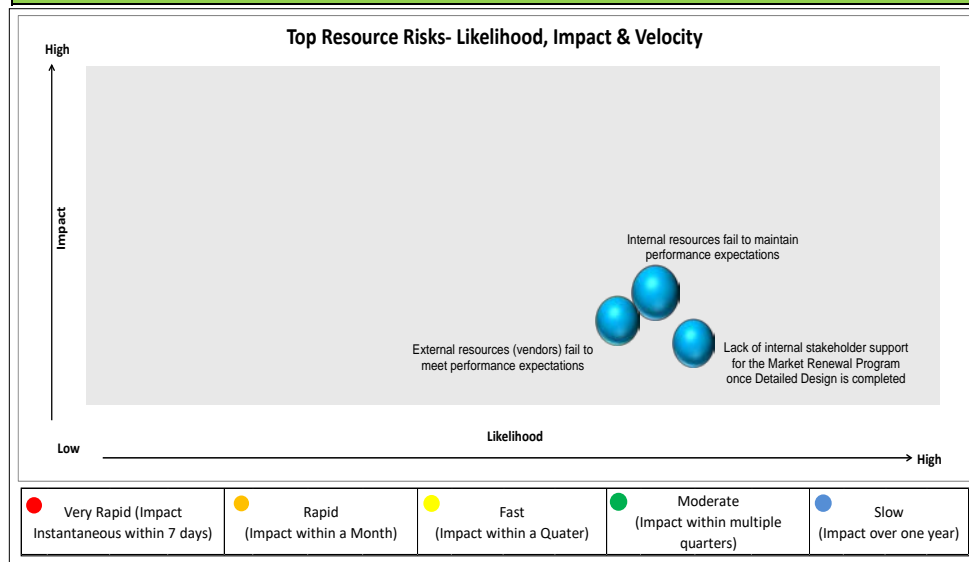
## MRP RISK SUMMARY - MRESC as of Nov 30, 2018

### RISK VELOCITY PER CATEGORY

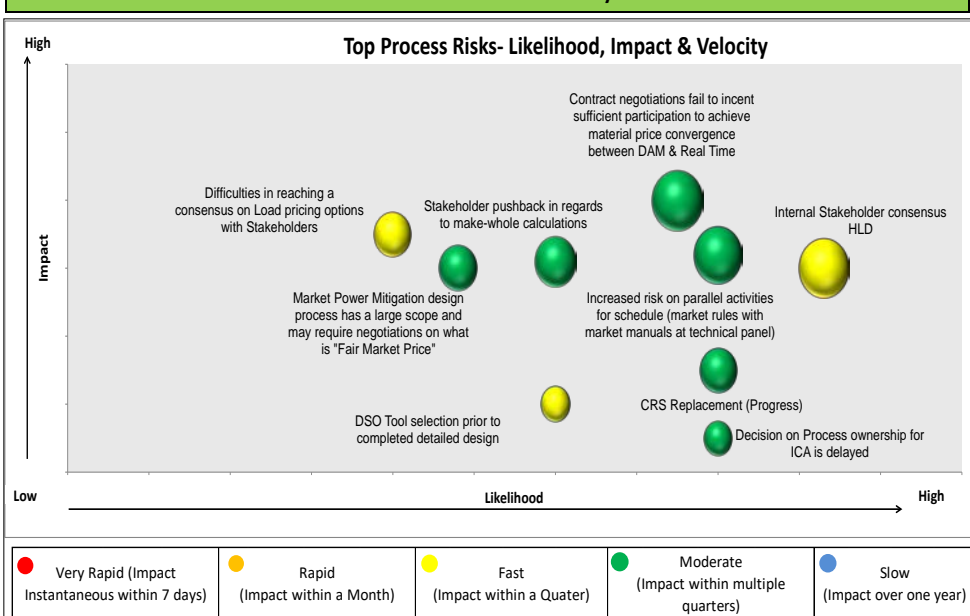
#### External Risks - Risk Velocity



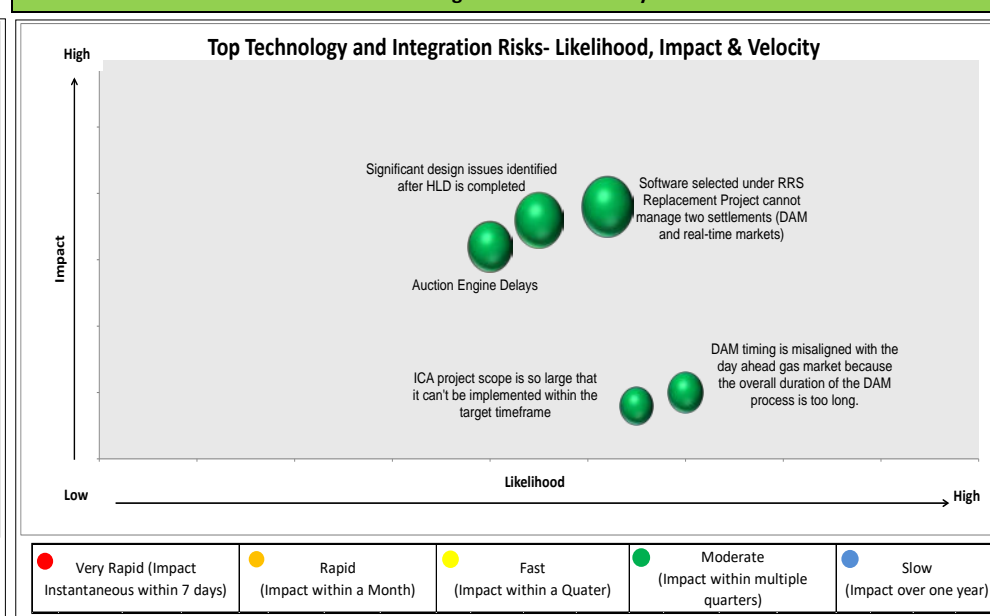
#### Resource Risks - Risk Velocity



#### Process Risks - Risk Velocity



#### IT & Integration - Risk Velocity



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# MARKET RENEWAL PROGRAM

## Key Summary

### Schedule

The program is overall slightly behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.94. This value is in the Green category. Within the program, the Energy work stream SPI is 0.98 (Green), which is consistent with last month; the Capacity work stream SPI is 0.92 (Green).

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.03. This value is in the Green category, and corresponds to the SPI being less than 1. The program has not been able to spend the budgeted money on the consultants and resources as planned in the schedule, resulting in an overall underspend against the forecast. The Energy work stream CPI is 1.02 while the Capacity work stream CPI is 1.09.

### Risk

Risk consultant, KPMG, continues working jointly with the MRP and Enterprise Risk teams. MRP Risk observations and recommendations draft report completed. Findings to be presented to MRESC for comments. Next steps for the report, includes management action plans, and target implementation dates to be added prior to February 28, 2019 Board meeting.

### Upcoming Milestones

The high-level design documents for the Day-Ahead Market and Enhanced Real-Time Unit Commitment were published for external stakeholder feedback on December 20. Feedback is due on February 28.

The draft high-level design for the Incremental Capacity Auction was circulated for internal stakeholder feedback on December 18. Internal review sessions will be held on January 15 & 17, with feedback due on January 29.

Schedule, Cost, Risk, and Milestone data as of December 31, 2018.

Prepared: January 11, 2019

MRESC Meeting: January 16, 2019

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Printed:2019/01/14

**Program: MRP-Market Renewal Program**

Monthly Cost Report for MRESC  
January 14, 2019

Document Ref. No.: PRG\_MCR12

**Period: Month Ending  
31-Dec-18**

<b>Program Cost Summary:</b>					
	<b>2017 <sup>(1)</sup></b>		<b>2018 <sup>(1)</sup></b>		
	<b>Operating</b>	<b>Capital</b>	<b>Operating</b>	<b>Capital</b>	<b>Total <sup>(5)</sup></b>
<i>Business Plan Approved Costs</i>	9,247		12,700	4,000	16,700
<i>Contingency</i>	2,760				
<b>Business Plan with Contingency</b>	<b>12,007</b>		<b>12,700</b>	<b>4,000</b>	<b>16,700</b>
<i>Forecast</i>	7,972				
<i>2018 Forecast Rolling <sup>(2)</sup></i>			14,893	1,151	16,043
<i>Contingency <sup>(3)</sup></i>				90	90
<b>Forecast with Contingency</b>	<b>7,972</b>		<b>14,893</b>	<b>1,241</b>	<b>16,133</b>
<i>Actual Costs <sup>(4)</sup></i>	7,902	201	14,781	1,398	16,179
<i>Contingency</i>					
<b>Actual with Contingency</b>	<b>7,902</b>	<b>201</b>	<b>14,781</b>	<b>1,398</b>	<b>16,179</b>
<b>Variance - Actual vs Forecast with Contingency</b>	<b>-70</b>	<b>201</b>	<b>-112</b>	<b>158</b>	<b>46</b>

Notes:

(1) Report in thousands (000's).

(2) Includes Q4 Capital Forecast for SSM.

(3) No contingency for 2018 operating forecasted costs.

(4) Actual costs for 2018 are YTD.

(5) Total shows combined operating and capital costs for current year.

## MRP - Operating Financial Summary - 31-Dec-18

The Business Plan Approved Costs for MRP have been divided into the four projects: SSM, DAM, ERUC, and ICA, as well as a general account for tracking costs associated with Program related activities. Each project has been forecasted to reflect the cost expectations for 2018. The actual costs are being tracked against the 2018 rolling forecast.

### Variance Summary:

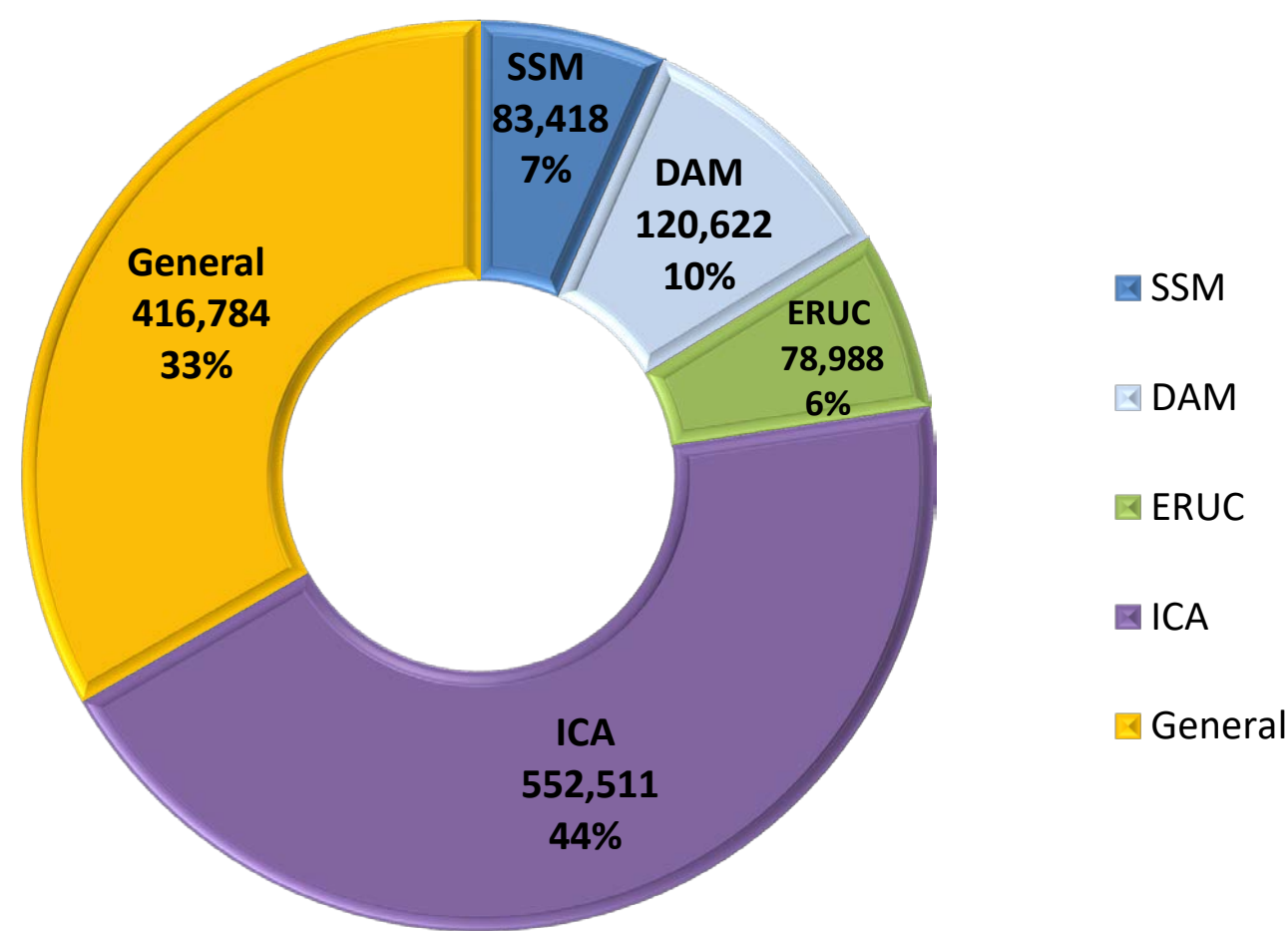
MRP spend for December is 18% below the monthly rolling forecast, with the Year to Date spend being 1% below forecast.

The life to date (2017-2018) actuals for MRP is \$22.7M in Operating costs with the final Operating costs being \$2.1M above the approved Business Plan for 2018.

### Overview of MRP Monthly Costs: 31-Dec-18

MRP Operating Costs													
Monthly								Year to Date					
Project Name	Business Plan Approved Costs	2018 Forecast Rolling	Actual	Variance Actual vs Forecast	Variance %	Status for 31-Dec-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Rolling	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$219,849	\$82,207	\$83,418	\$1,211	1%	Above Forecast		\$2,716,441	\$1,681,474	\$1,682,685	\$1,211	0%	Above Forecast
DAM	\$72,845	\$191,000	\$120,622	(\$70,378)	(37%)	Below Forecast		\$917,268	\$1,940,244	\$1,869,867	(\$70,377)	(4%)	Below Forecast
ERUC	\$72,845	\$105,800	\$78,988	(\$26,812)	(25%)	Below Forecast		\$917,268	\$948,282	\$921,470	(\$26,812)	(3%)	Below Forecast
ICA	\$286,172	\$782,720	\$552,511	(\$230,209)	(29%)	Below Forecast		\$3,521,116	\$5,166,624	\$5,119,229	(\$47,395)	(1%)	Below Forecast
General	\$378,468	\$362,473	\$416,784	\$54,311	15%	Above Forecast		\$4,627,915	\$5,133,160	\$5,187,471	\$54,311	1%	Above Forecast
<b>Total Program</b>	<b>\$1,030,180</b>	<b>\$1,524,200</b>	<b>\$1,252,323</b>	<b>(\$271,878)</b>	<b>(18%)</b>	<b>Below Forecast</b>		<b>\$12,700,008</b>	<b>\$14,869,785</b>	<b>\$14,780,722</b>	<b>(\$89,063)</b>	<b>(1%)</b>	<b>Below Forecast</b>

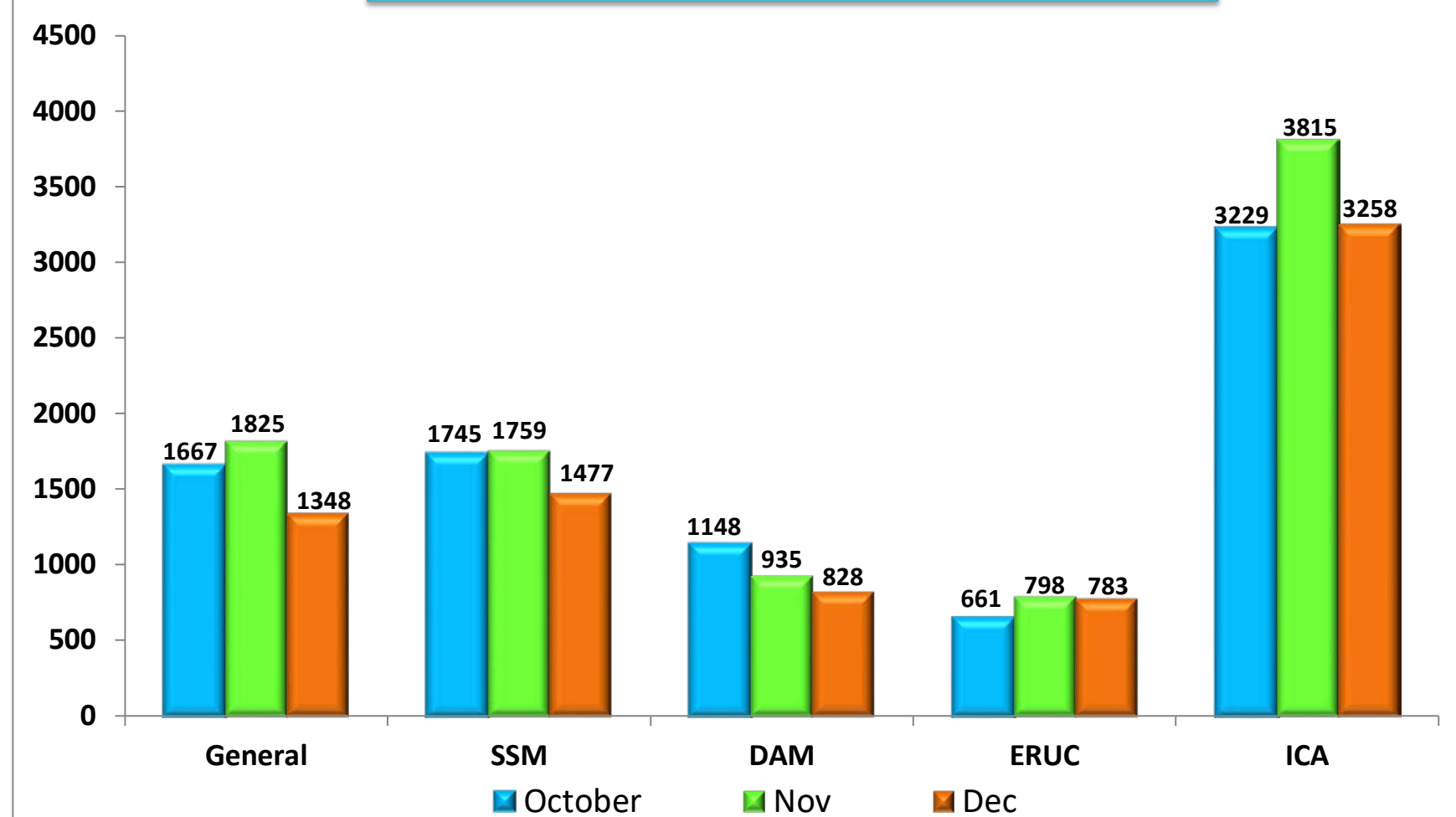
Monthly Actual Costs by Project



Notes:- The above graph reflects MRP actual cost allocation per projects and percentage. The monthly cost split reflect the Energy workstreams winding down on HLD, and a ramping up of effort in the Capacity workstream. The General account remains relatively unchanged at 33% of the total cost.

Total Monthly Hours

MRP Monthly Comparison of IESO Internal Labour Hours

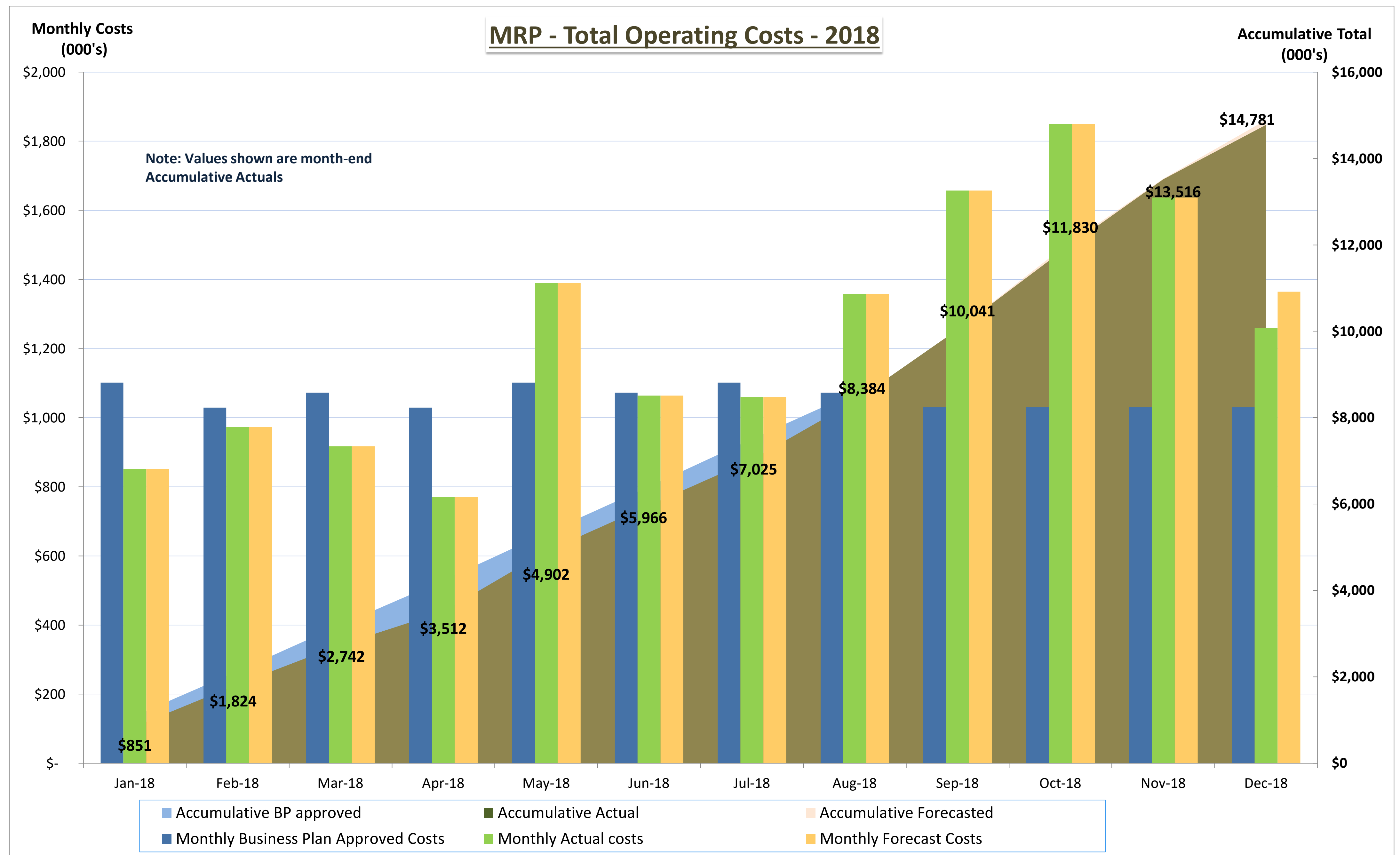


Notes:- The December hours align with expectations reflecting reduced hours over the holiday season.

MRP Monthly Comparison - 2018 Operating Actuals

Project	Jan	Feb	Mar	Apr	May	June	July	August	September	October	November	December	YTD
SSM	49,895	88,106	83,920	149,380	224,771	177,132	139,711	135,828	203,940	244,208	102,376	83,418	1,682,685
DAM	181,602	112,941	92,211	76,836	184,715	151,237	135,882	146,652	203,580	265,530	198,059	120,622	1,869,867
ERUC	13,324	80,158	97,317	55,286	86,282	84,620	68,945	39,796	89,125	140,123	87,507	78,988	921,470
ICA	358,104	272,219	234,502	160,362	475,585	296,832	320,248	505,435	582,079	699,705	661,648	552,511	5,119,229
General	248,520	419,358	409,454	328,396	418,505	354,343	394,726	530,442	578,632	500,694	587,619	416,784	5,187,471
<b>Total</b>	<b>851,444</b>	<b>972,782</b>	<b>917,404</b>	<b>770,259</b>	<b>1,389,859</b>	<b>1,064,164</b>	<b>1,059,512</b>	<b>1,358,152</b>	<b>1,657,355</b>	<b>1,850,259</b>	<b>1,637,209</b>	<b>1,252,323</b>	<b>14,780,722</b>





Notes:- The above graph compares monthly actuals against a monthly rolling forecast.

MRP - Capital Financial Summary - 31-Dec-18

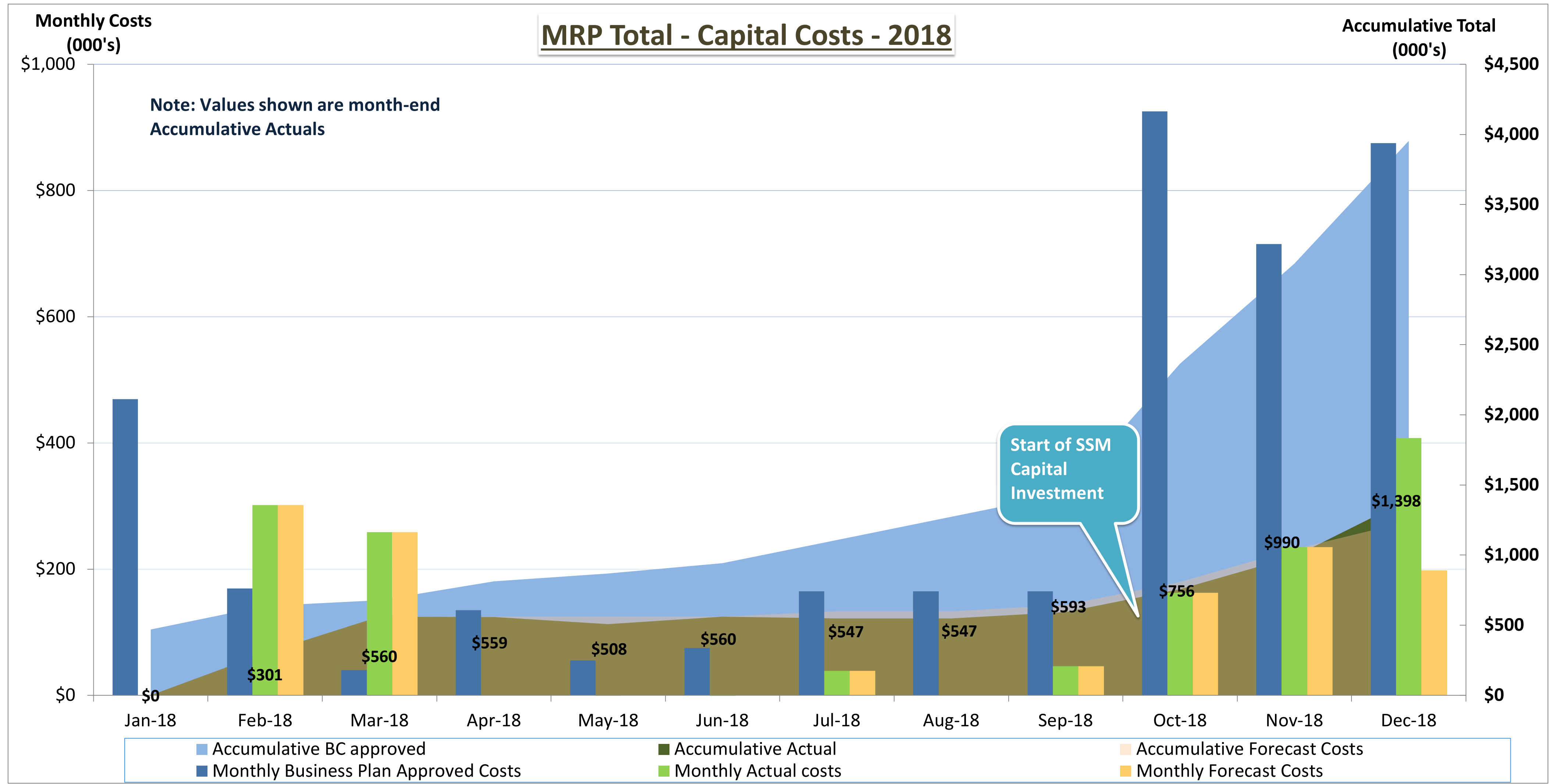
The capital costs approved under the 2018 Approved Business Plan is to capture the costs of detailed design work projected for 2018 as well as the costs for relocating the MRP team to our UMR location.

Variance Summary:

The life to date (2017-2018) actuals for MRP for Capital is 1.6M, of which 1.4M was spent in 2018 as the Energy work stream wrapped up its High Level Design phase of the project.

Overview of MRP Monthly Costs: 31-Dec-18

MRP Capital Costs													
Monthly								Year to Date					
Project Name	Business Plan Approved Costs	2018 Forecast Rolling	Actual	Variance Actual vs Forecast	Variance %	Status for 31-Dec-18	Comments	YTD Business Plan Approved Costs	YTD 2018 Forecast Rolling	YTD Actual	YTD Actual vs Forecast	Variance %	YTD Status
SSM	\$343,861	\$198,002	\$396,986	\$198,984	100%	Above Forecast		\$1,075,085	\$594,651.00	\$793,635	\$198,984	33%	Above Forecast
General - UMR	\$158,430.00	\$0	\$10,833	\$10,833	-	Above Forecast		\$1,254,524	\$645,879	\$604,588	(\$41,291)	(6%)	Below Forecast
Total Program	\$502,290.50	\$ 198,002.00	\$407,819	\$209,817	106%	Above Forecast		\$2,329,609	\$1,240,530	\$1,398,223	\$157,693	13%	Above Forecast

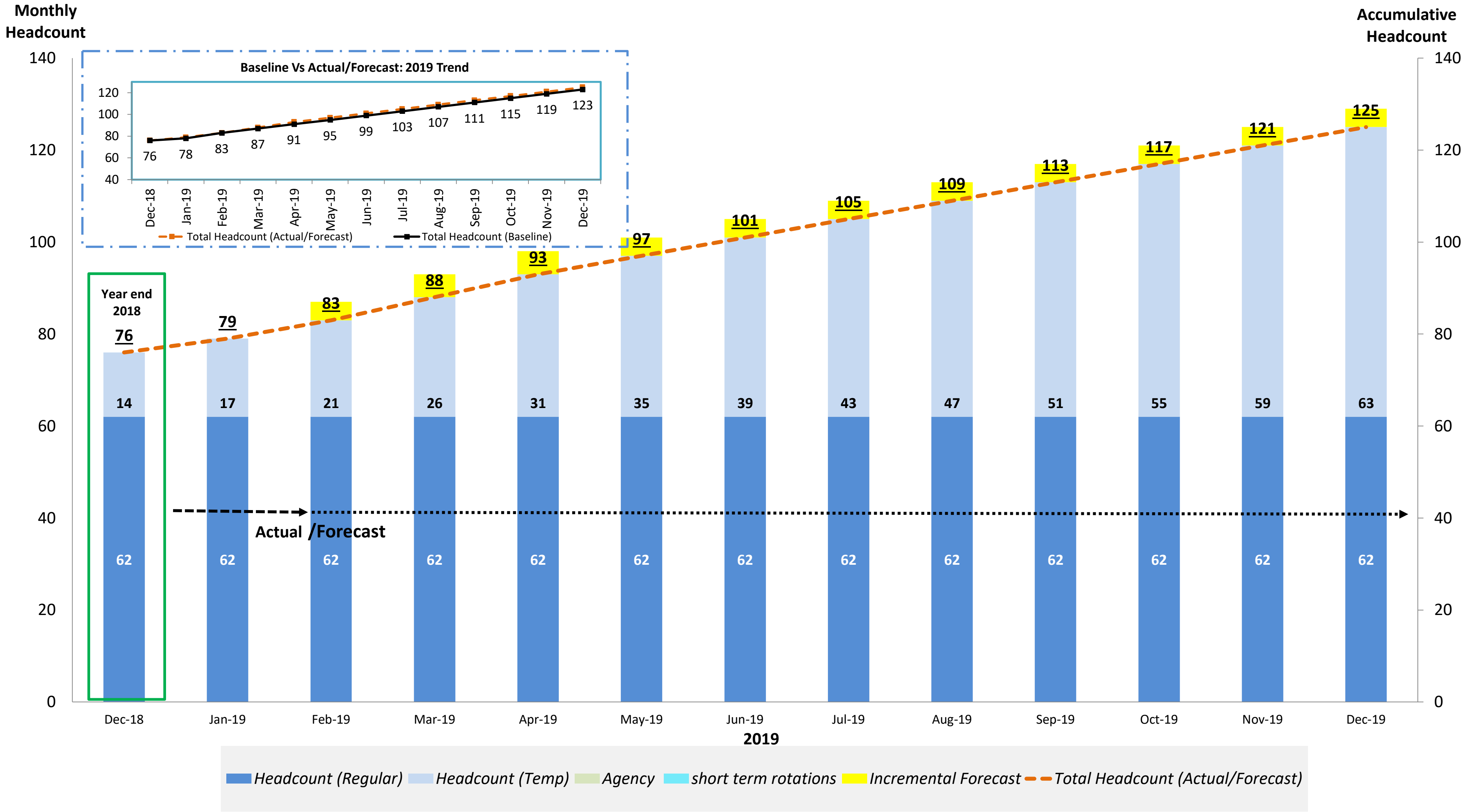


Notes:- The graph reflects the initial expectations stated in the approved business plan with capital budget of \$4M and with detailed designs beginning in Q4 2018. December's Capital costs consists of internal labour costs and contract services for SSM .

MRP Monthly Comparison - 2018 Capital Actuals													
Project	Jan	Feb	Mar	Apr	May	June	July	August	September	October	November	December	YTD
SSM	-	-	-	-	-	-	-	-	-	154,841	241,808	396,986	793,635
General - UMR Relocation	-	301,297	258,878	-	- 919	- 51,205	39,022	-	46,105	7,548	- 6,971	10,833	604,588
Total	-	301,297	258,878	-	- 919	- 51,205	39,022	-	46,105	162,389	234,837	407,819	1,398,223



MRP Monthly and Accumulative Headcount - 2019



Notes For Actuals: Jan changes: (3) Two Snr Planner (Temp) ICA, and 1 Market Advisor (Temp) ICA

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**Program: MRP-Market Renewal Program**

**Project: Total MRP Program**

**Monthly Schedule Report for MRESC**  
*December 31, 2018*

**Document Ref. No.: MRP\_MSR10\_18-12-31**  
**(MSR ~ 10)**

**Project Commencement Reporting Date: Jan 1, 2018**  
**Project Completion Reporting Date: Dec 31, 2018**

Reporting Range Period	From <i>January 1, 2018</i>	<<<<<	>>>>>	To <i>December 31, 2018</i>
------------------------	--------------------------------	-------	-------	--------------------------------

For Week ending	<i>December 31, 2018</i>
-----------------	--------------------------

Reporting Date	<i>January 14, 2019</i>
----------------	-------------------------

**Program Schedule Status**

Schedule Baseline	Cumulative Planned %	Cumulative Actual %	Variation %	Schedule Variance <sup>(1)</sup>
	100.0%	94.1%	<i>(-5.89%)</i>	Under Threshold

**Month End Project Performance Status**

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	<i>\$17,700,000</i>	<i>\$16,657,395</i>	<i>0.94</i>	Behind Schedule

Cost Performance	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	<i>\$16,178,945</i>	<i>\$16,657,395</i>	<i>1.03</i>	Under Budget

**Legend for Status:**

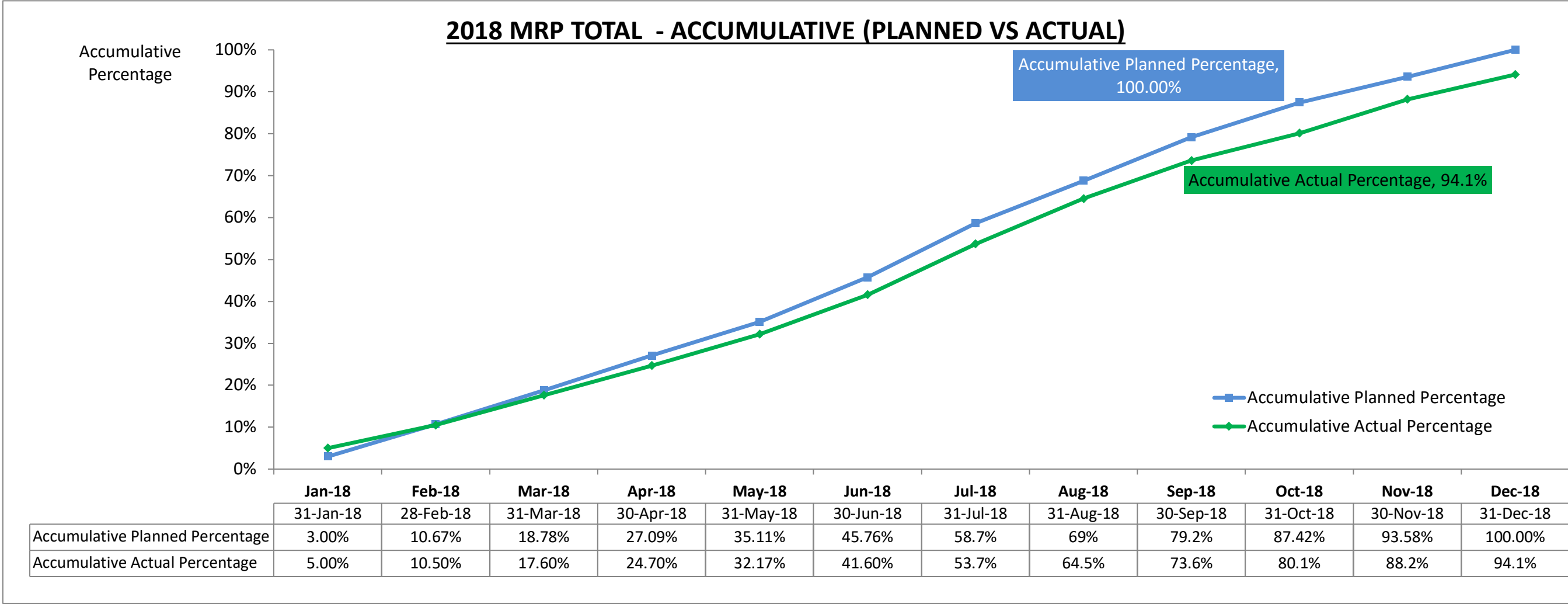
- (1). Threshold upper limit: assumption is -10%, If variation exceed (-10%) threshold limit schedule to be revised  
(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule" or if SPI=1 "On Schedule"  
(3). Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"  
Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.



Monthly Status as of: 31-Dec-18

PROGRESS INDICATORS								
MRP	2018 Total Forecast at Completion (BAC) <sup>(1)</sup>	2018 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed
SSM	\$2,943,020	\$2,476,320	16.6%	01-Jan-18	31-Dec-18	100.00%	97.97%	16.3%
DAM	\$1,285,642	\$1,869,867	7.3%	01-Jan-18	31-Dec-18	100.00%	97.00%	7.0%
ERUC	\$1,156,763	\$921,470	6.5%	01-Jan-18	31-Dec-18	100.00%	97.82%	6.4%
ICA	\$6,069,638	\$5,119,229	34.3%	01-Jan-18	31-Dec-18	100.00%	92.06%	31.6%
GENERAL	\$6,244,937	\$5,792,059	35.3%	01-Jan-18	31-Dec-18	100.00%	93.00%	32.8%
MRP Total	\$17,700,000	\$16,178,945	100%			100.0%		94.1%

PERFORMANCE INDICATORS			
Earned Value (EV) <small>(BAC X Monthly Scheduled Actual Progress)</small>	Planned Value (PV) <small>(BAC X Monthly Scheduled Planned %)</small>	CPI (EV/AC)	SPI (EV/PV)
\$2,883,277	\$2,943,020	1.16	0.98
\$1,247,073	\$1,285,642	0.67	0.97
\$1,131,546	\$1,156,763	1.23	0.98
\$5,587,709	\$6,069,638	1.09	0.92
\$5,807,791	\$6,244,937	1.00	0.93
\$16,657,395	\$17,700,000	1.03	0.94

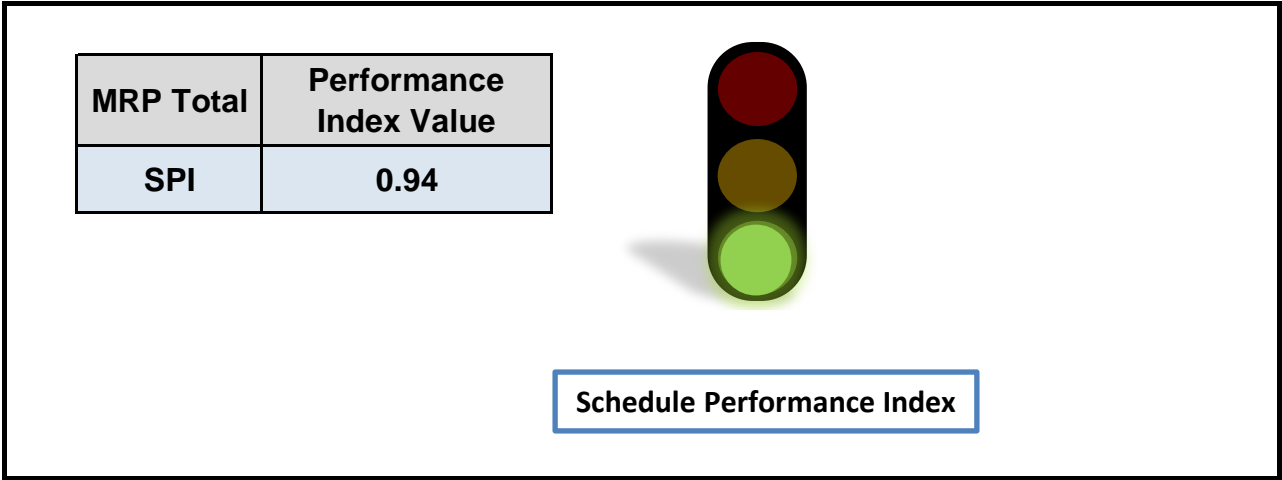


Notes
 

(1) 2018 Forecast values and not Budget values will be used.
 (2) Overall Schedule Variance for MRP Total is -5.9%

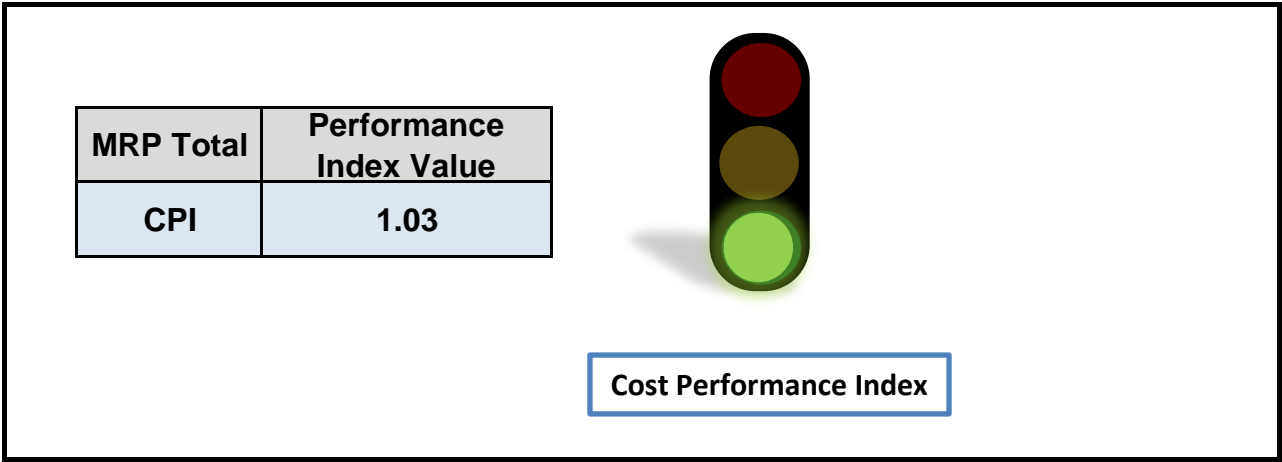


Monthly Performance Status: 31-Dec-18

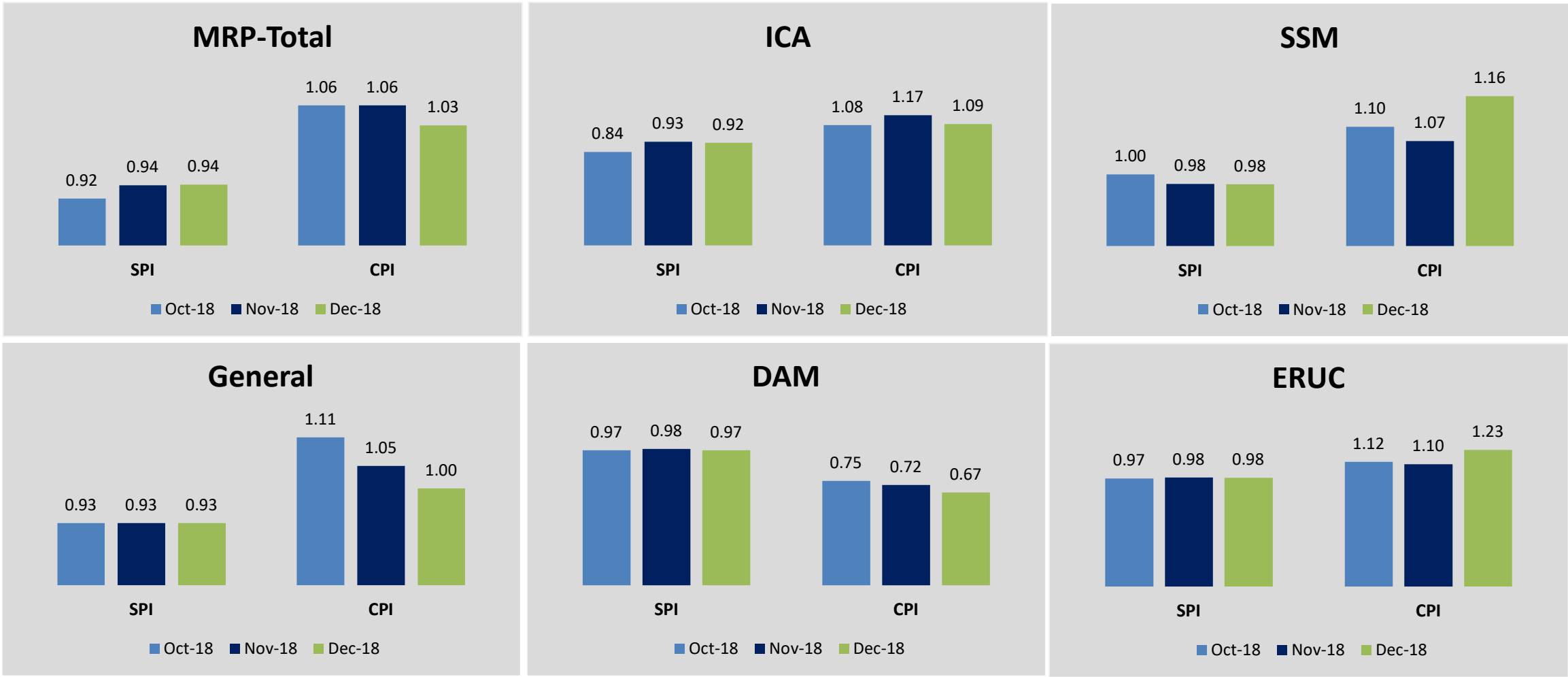


Threshold limits

Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9



Three Month Rolling Performance Comparison 31-Dec-18



**PMI Definitions:**

**CPI (Cost Performance Index)**  
The cost performance index (**CPI**) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

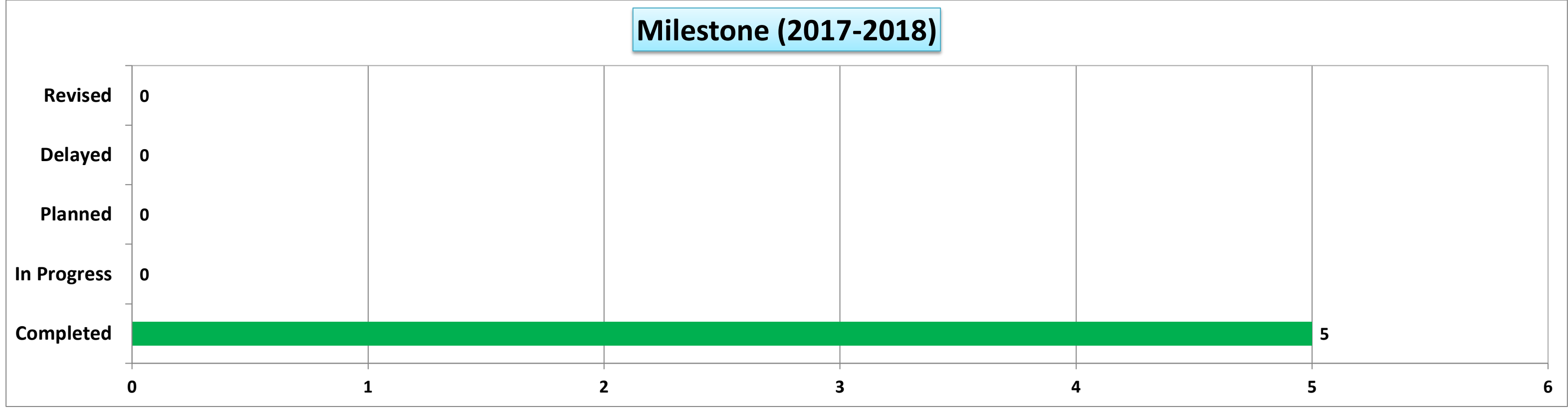
**SPI (Schedule Performance Index)**  
Schedule performance index (**SPI**) is a ratio of the earned value (EV) to the planned value (PV). **SPI** = EV ÷ PV. If the **SPI** is less than one, it indicates that the **project** is potentially behind schedule to-date whereas an **SPI** greater than one, indicates the **project** is running ahead of schedule





SSM-Project Milestone Status31-Dec-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision- Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	28-Sep-18	28-Sep-18	27-Sep-18	27-Sep-18	Completed	



SSM-Design Elements Progress31-Dec-18

S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 2: Energy Ref Price	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
2	DE 1: Energy Congestion Price	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
3	DE 3: Energy Ref Price loss Component	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
4	DE 6: Supplier Pricing	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
5	DE 7: Operating Reserve Reference Price	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
6	DE 8: Reserve Congestion Price	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
7	DE 11: Multi-interval optimization (MIO) pricing run and ramp rate Multiplier	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
8	DE4: Pre or Post interval pricing	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
9	DE 5: Intertie Congestion Price	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
10	DE 9: Resolving Constraint Violations	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
11	DE 12: Pricing setting Eligibility for Resources	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
12	DE 10: Out of Market Operator Actions	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
13	DE 18: Make Whole Payment	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
14	DE 19: Uplift Recovery	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
15	DE 13: Mitigation Process	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
16	DE 14: Timing of Application	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
17	DE:15 Reference Levels	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
18	DE 16: Pricing for Loads	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019
19	DE 17: Congestion Rents & Loss residuals	10	8	Completed	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019

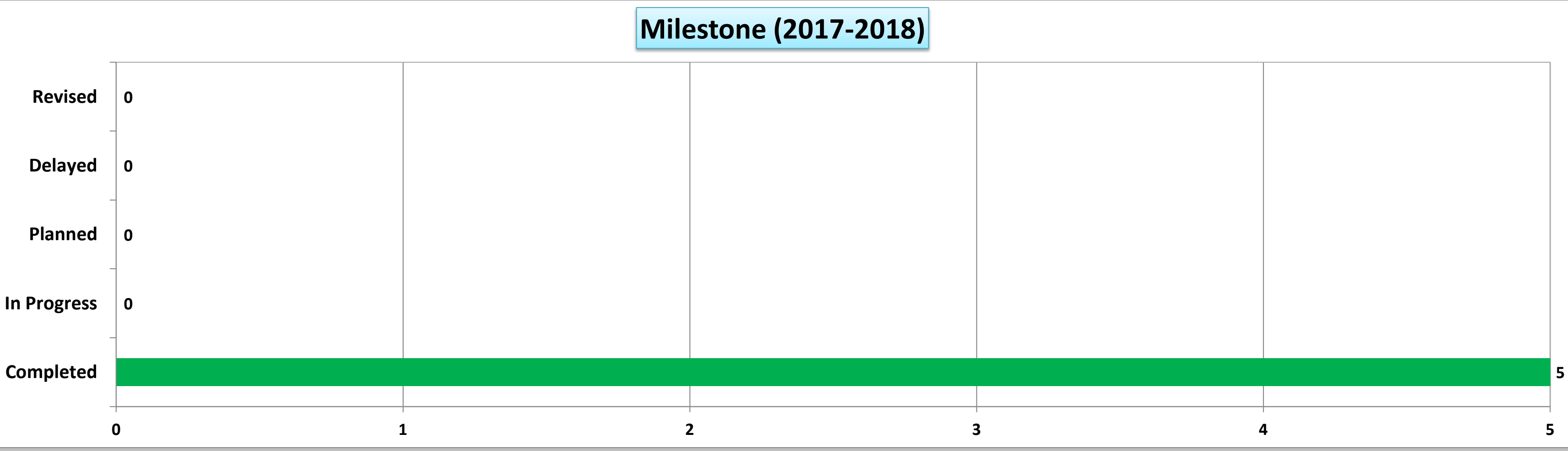
- Notes:
- 1. Review 1 : Includes internal review of all design elements in three different parts
  - 2. Review 2 : Internal review of HLD (all three parts combined)
  - 3. Review 3 : Publish HLD to external stakeholders
  - 4. Review 4: Incorporate comments on HLD from external Stakeholders
  - 5. Review 5: HLD Approval





DAM-Project Milestone Status31-Dec-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	19-Jul-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18	20-Dec-18	20-Dec-18	Completed	



DAM-Design Elements Progress31-Dec-18

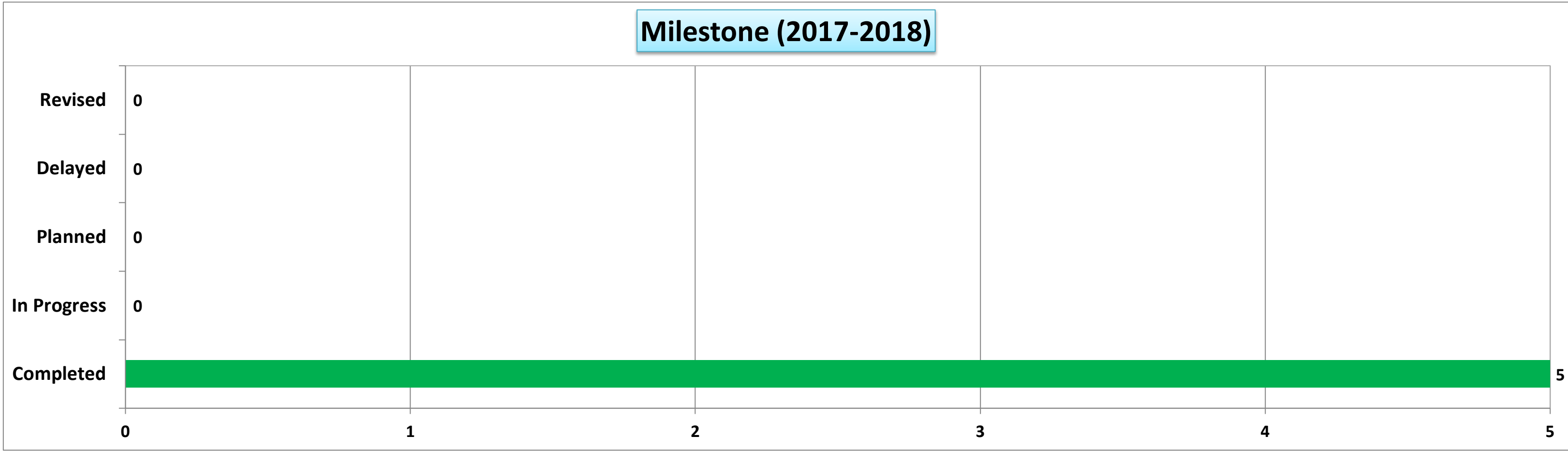
S.No	Design Element	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Offer Obligations (formerly Reference Quantity)	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
2	DE 4: Reliability Input Parameters	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
3	DE 6: Functional Passes	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
4	DE 8: Submission and Posting Deadlines	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
5	DE 9: Initiation of Operational Commitments	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
6	DE 11: Price Setting Eligibility	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
7	DE 12: Reporting Obligations	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
8	DE 14: Two Settlement for Supply	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
9	DE 16: Uplift Recovery	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
10	DE 3: Supply Participation: Variable Generation	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
11	DE 17: Financial Transmission Rights	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
12	DE 18: Market System Failures	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
13	DE 2: Load Participation	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
14	DE 5: Virtual Transactions	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
15	DE 7: Optimization Energy Limited Resources	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
16	DE 15: Make Whole Payments	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
17	DE10: Market Power Mitigation	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
18	DE 13: Two Settlement for Load	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019

- Notes:
- 1. Review 1 : Includes internal review of all design elements in three different parts
  - 2. Review 2 : Internal review of HLD (all three parts combined)
  - 3. Review 3 : Publish HLD to external stakeholders
  - 4. Review 4: Incorporate comments on HLD from external Stakeholders
  - 5. Review 5: HLD Approval



ERUC-Project Milestone Status31-Dec-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	4-May-17	29-Jun-17	4-May-17	29-Jun-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations	27-Jul-17	29-Mar-18	27-Jul-17	29-Mar-18	Completed	
4	Stakeholder Engagement- Design Decision Presented	29-Mar-18	24-May-18	29-Mar-18	19-Jul-18	Completed	
5	High Level Design Document (External Publication)	21-Dec-18	21-Dec-18	20-Dec-18	20-Dec-18	Completed	



ERUC-Design Elements Progress31-Dec-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
									Internal		External Stakeholders	Internal	
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft Contents	6. Review 1	7. Review 2	8. Review 3	9. Review 4	10. Review 5 (Approval)
1	DE 1: Functional Passes	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
2	DE 2: Look Ahead Period	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
3	DE 3: Timing and Frequency of Run	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
4	DE 4: Time Step	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
5	DE 5: Intertie Transactions	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
6	DE 6: Must Offer Requirements	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
7	DE 7: Eligibility for Make-whole	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
8	DE 8: Market Participant Data	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
9	DE 9: Commitment Cost Mitigation	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
10	DE10: Offer Changes	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
11	DE 11: Binding Start-up Instruction and Operational Constraint	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
12	DE 12: Calculation of Make Whole Payment	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019
13	DE 13: Failure Charge	10	7	Completed	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019

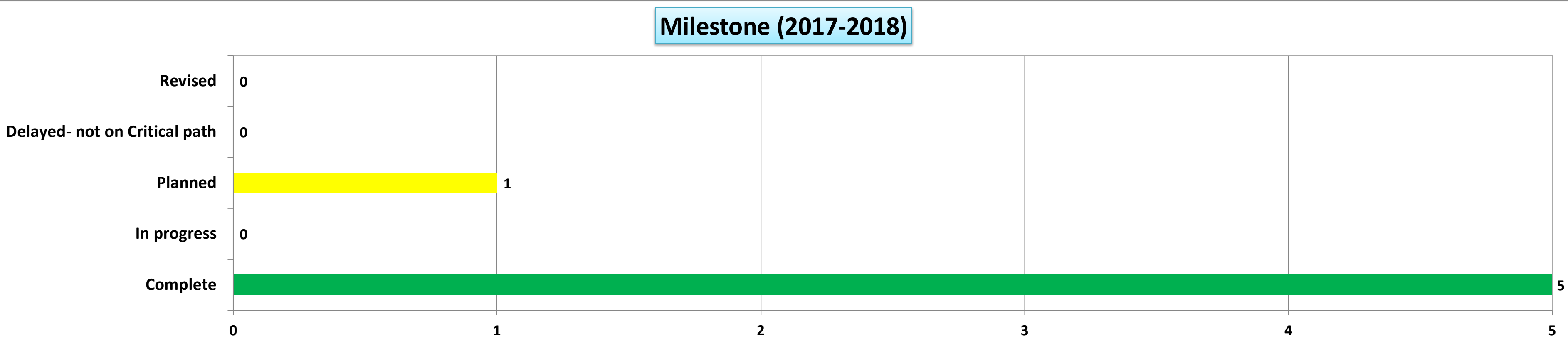
- Notes:
- 1. Review 1 : Includes internal review of all design elements in three different parts
  - 2. Review 2 : Internal review of HLD (all three parts combined)
  - 3. Review 3 : Publish HLD to external stakeholders
  - 4. Review 4: Incorporate comments on HLD from external Stakeholders
  - 5. Review 5: HLD Approval





ICA-Project Milestone Status31-Dec-18

S.No	Milestone (2017-2018)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	Stakeholder Engagement- Intro & Fundamentals	18-May-17	20-Jul-17	18-May-17	20-Jul-17	Completed	
2	RACI for Design Elements	4-Nov-17	4-Nov-17	4-Nov-17	4-Nov-17	Completed	
3	Stakeholder Engagement- Options & Recommendations-Phase 2	16-Aug-17	17-Apr-18	16-Aug-17	14-Jun-18	Completed	
4	RFP for Auction Engine	19-Dec-18	4-Dec-19			Planned	RFI Completed, RFP Process reforecasted based on ICA priorities, Scheduled for Q1 2019
5	Stakeholder Engagement- Design Decision Presented	12-Sep-18	19-Oct-18			Completed	
6	Publish HLD internally for review 1	19-Dec-18	19-Dec-18	19-Dec-18	19-Dec-18	Completed	



ICA-Design Elements Progress31-Dec-18

S.No	Design Elements	Completion Stages	Stages Completed	STAGES									
										Internal	External Stakeholders	Internal	Approval
				1. Options & Recommendations	2. SE Presentation	3. Receive SE Feedback	4. Preliminary Decision	5. Draft HLD Templates	6. Draft HLD Contents	7. Review 1	8. Review 2	9. Review 3	10. Review 4
1	DE 1: Participation Requirement	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
2	DE 2: Resource Eligibility	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
3	DE 3: Qualified Capacity	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
4	DE 4: Market Power Mitigation	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
5	DE 5: Length of Forward Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
6	DE 6: Commitment Period	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
7	DE 7: Multi-Year Commitments	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
8	DE 8: Locational Considerations	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
9	DE 9: Slope of Demand Curve	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
10	DE 10: Target Capacity	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
11	DE 11: Min/Max Capacity Limits	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
12	DE 12: Net Cost of New Entry	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
13	DE 13: Max Auction Clearing Price	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
14	DE 14: Rebalancing Auctions	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
15	DE 15: Resource Obligations (within forward period)	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
16	DE 16: Non-Performance Implications (within forward period)	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
17	DE 17: Resource Performance Obligations	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
18	DE 18: Performance Assessment	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
19	DE 19: Cost Recovery	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
20	DE 20: Auction Mechanics	10	5	Completed	Completed	Completed	Completed	Not Applicable	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019
21	DE 21: Settlements	10	6	Completed	Completed	Completed	Completed	Completed	Completed	In Progress	Planned 2019	Planned 2019	Planned 2019

Notes:  
1. Review 1 :Informal internal review of individual sections of HLD  
2. Review 2 : Publish HLD to external stakeholders  
3. Review 3 : Revise HLD Document based on External Stakeholders feedback  
4. Review 4: HLD Document Approval

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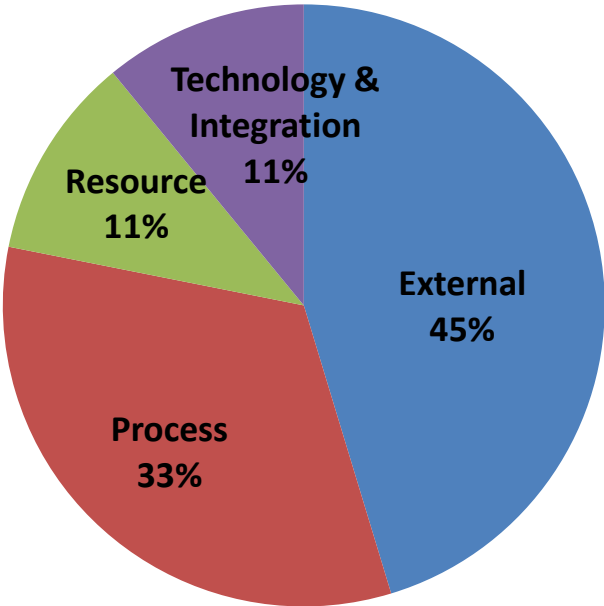
Program: MRP-Market Renewal Program

Monthly Risk Report For MRESC  
December 31, 2018

Document Ref. No.: PRG\_MRR08

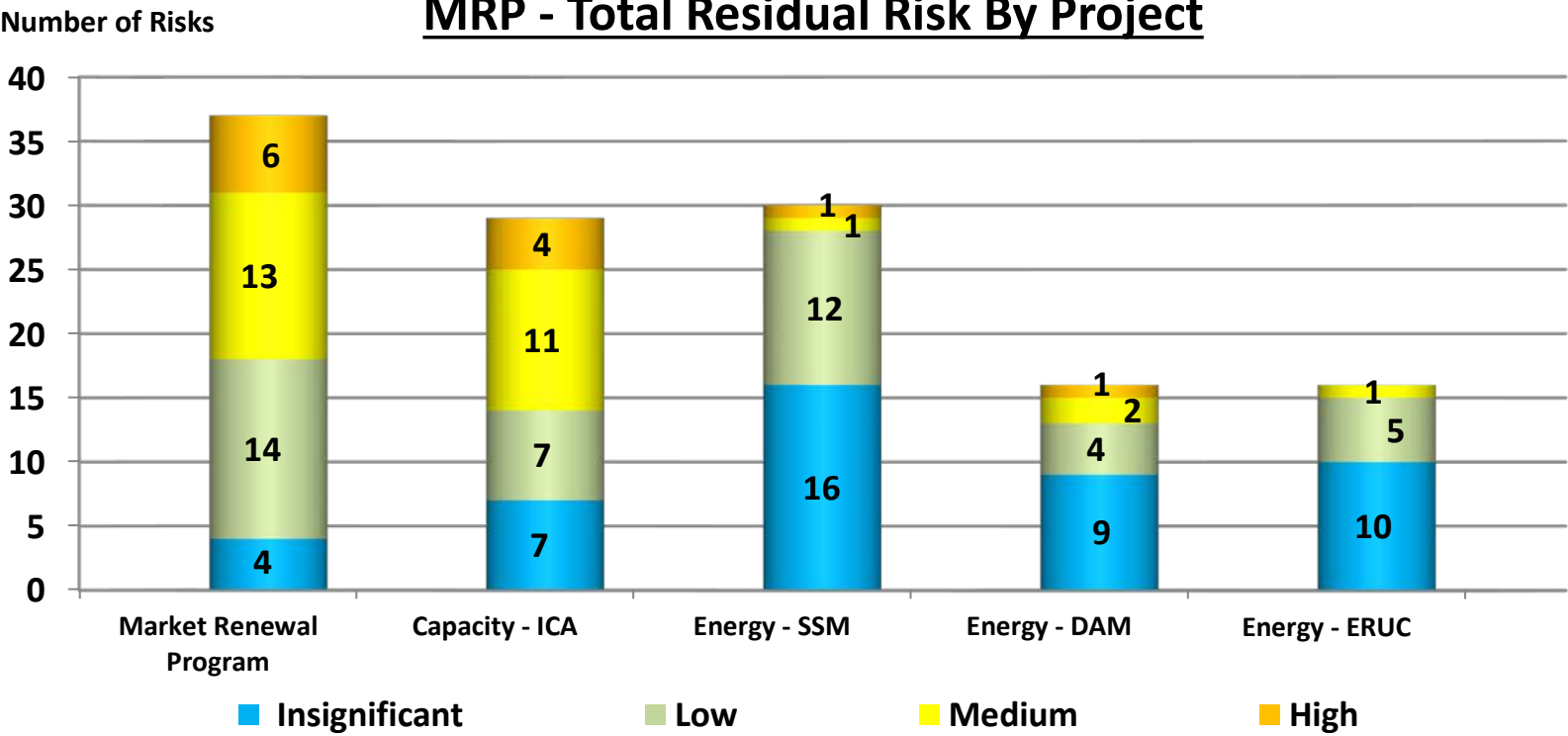
Period: Month Ending:31-Dec-18

MRP - Total Residual Risk By Category



All program and project risks have been categorised into four categories, with the largest category of risks being categories as "External" risks.

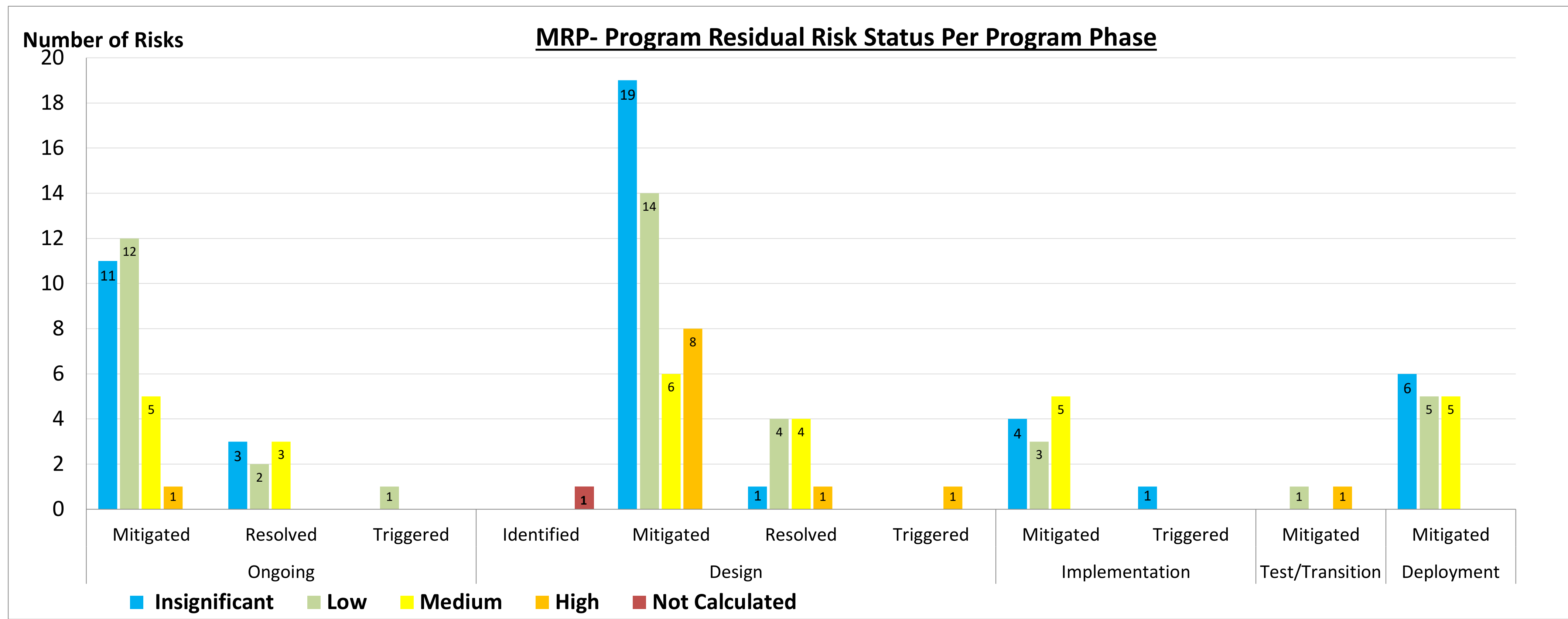
MRP - Total Residual Risk By Project



All MRP Risks have been divided into the four projects: SSM, DAM, ERUC and ICA, and Program risks. Each identified risk was assessed with the project team, and the document the risk response tasks that will be implemented proactively to prevent or at least reduce the level of the identified risk. In total we currently have 128 Risks



MRP RISK SUMMARY - MRESC as of Dec 31,2018								
TOP MRP CONTROLABLE RISKS - OPEN								
Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R027	Market Renewal Program	Design	External	OEB indicates they are not properly informed about the new market design.	High	Regulatory Affairs is leading all engagement with OEB and keeping Market Strategy group informed of meeting dates/materials. Targeted outreach (ad-hoc CEO updates, quarterly executive team updates, monthly staff updates etc.)	Mitigated	▬
MRP_R037	Market Renewal Program	Design	External	New Government adversely impacting MRP scope or schedule	High	Frequent communication with government to ensure alignment as much as possible.	Mitigated	▬
ICA_R024	Capacity - ICA	Design	Process	Lack of clarity regarding division of accountability between ICA Team and line of business	High	Engage internal stakeholders regarding roles and responsibilities of line staff vs. the ICA Team	Mitigated	⬇
DAM_R012	Energy - DAM	Design	Process	Contracted or rate-regulated participants may be resistive to DAM participation rules and two-settlement outcomes	High	Develop a strategic engagements plan with the SE team	Mitigated	▬
DAM_R007	Energy - DAM	Design	Process	Contract negotiations fail to incent sufficient participation to achieve material price convergence between DAM & Real Time	High	Ensure full participants engaging/soliciting on design features to ensure design will incentivize (price certainty, overall lower cost, etc...)	Mitigated	▬
MRP_R005	Market Renewal Program	Ongoing	Process	Difficulty reaching agreement with internal stakeholders (Change Management).	High	Operations and IT Leads assigned to reduce the impact as they are representing their respective areas. Director's Forum is setup to facilitate these escalations. Final step for resolution is the MRESC	Mitigated	⬇
MRP_R003	Market Renewal Program	Ongoing	Process	Critical interdependencies with other projects (e.g. CRS Replacement)	High	MRP Representation on dependent projects and representation on PSC. MRP leads and BA's to work with dependant projects to identify any impacts during design phase.	Mitigated	▬
ICA_R019	Capacity - ICA	Test/Transition	Process	The need for parallel activities on timeline (e.g. market rules with market manuals at technical panel)	High	Start activities as early as possible.	Mitigated	▬
MRP_R015	Market Renewal Program	Implementation	Technology & Integration	Design decisions need to be revisited due to technical limitations	High	IT Lead and resources have been introduced early on the program to reduce the likelihood and impact of this occurring. Furthermore software vendors will be part of the HLD.	Mitigated	▬
TOP MRP CONTROLABLE RISKS - RESOLVED								
Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R022	Market Renewal Program	Design	Process	Business Case approvals - approval delays could cause release of Capital expenditure for Detail work on Energy and Capacity work streams	High	Finance has proposed capitalisation expenditure rules that are referencing that the preliminary project stage is completed, and Management, with the relevant authority, implicitly or explicitly authorizes and commits to funding a computer software project. Instead of an approved business case.	Resolved	▬



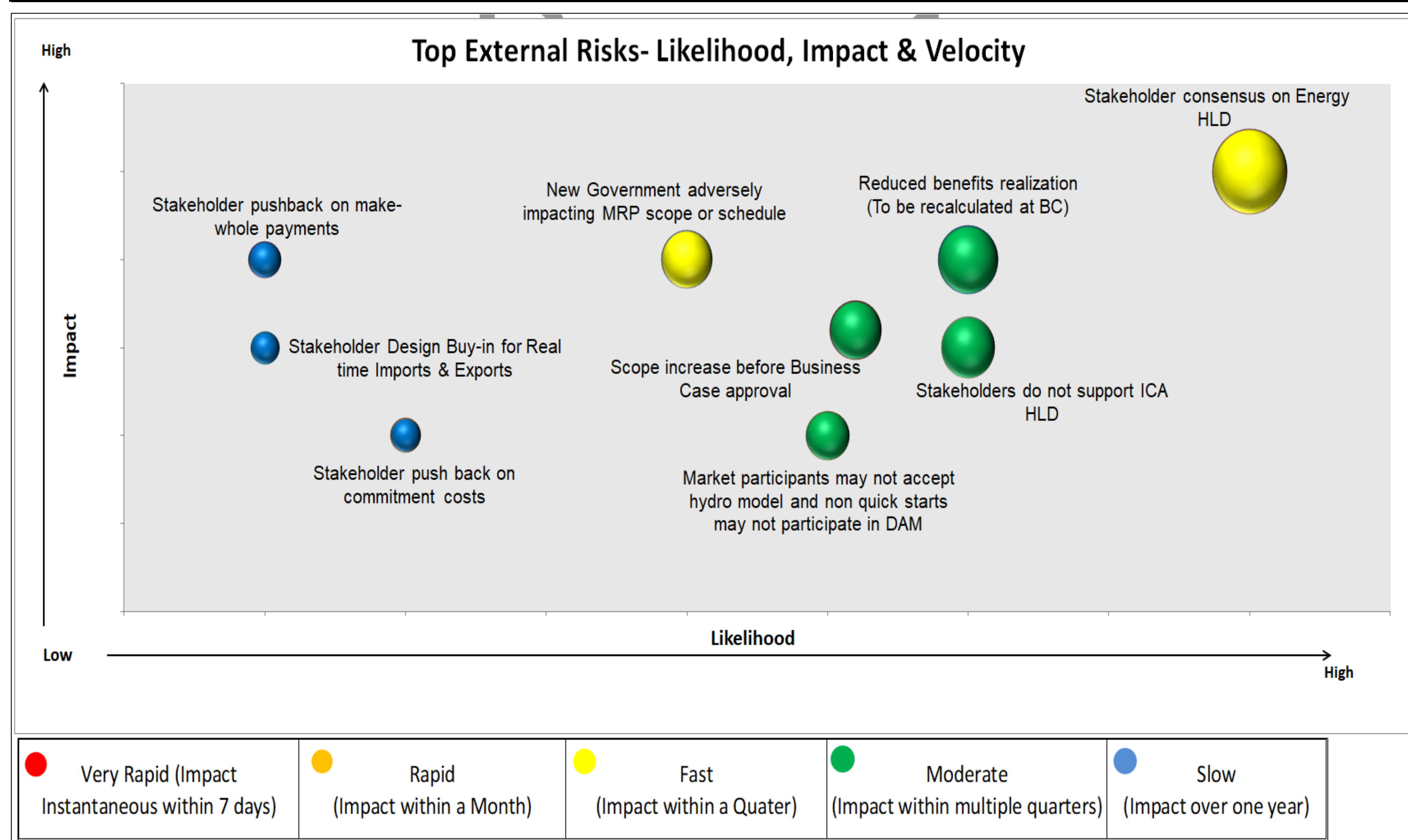
Updates on KPMG Risk Assessment
* Revised PMO Risk Methodology that aligns with ERM model completed, and roll-out within Enterprise Change by end Jan 2019.
*IESO/MRP Risk Interviews round two - Completed.
*MRP Risk observations and recommendations draft report completed. Findings to be presented to MRESC for comments. Next steps for the report, includes management action plans and target implementation dates to be added prior to February 28, 2019 Board Meeting.



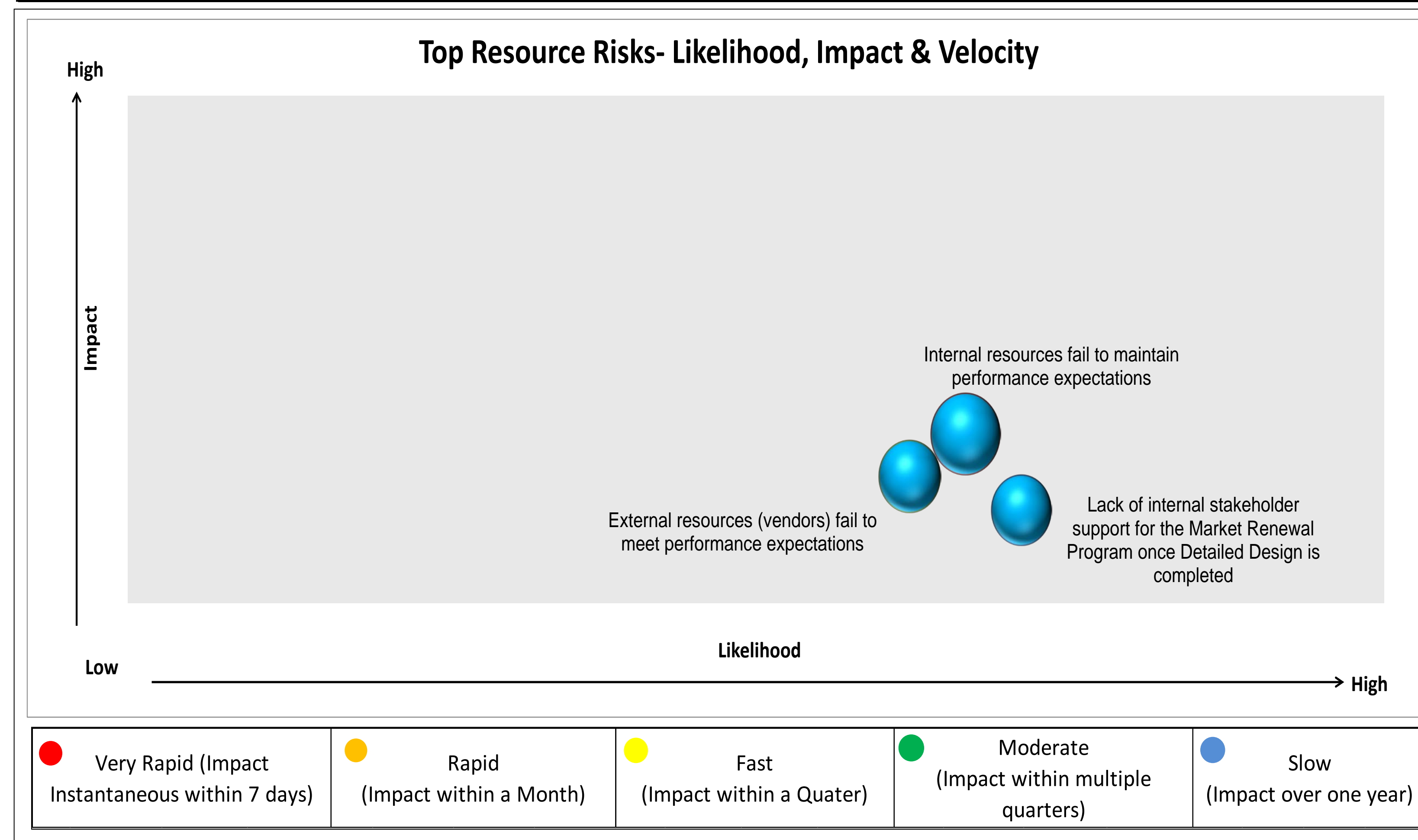
## MRP RISK SUMMARY - MRESC as of Dec 31,2018

### RISK VELOCITY PER CATEGORY

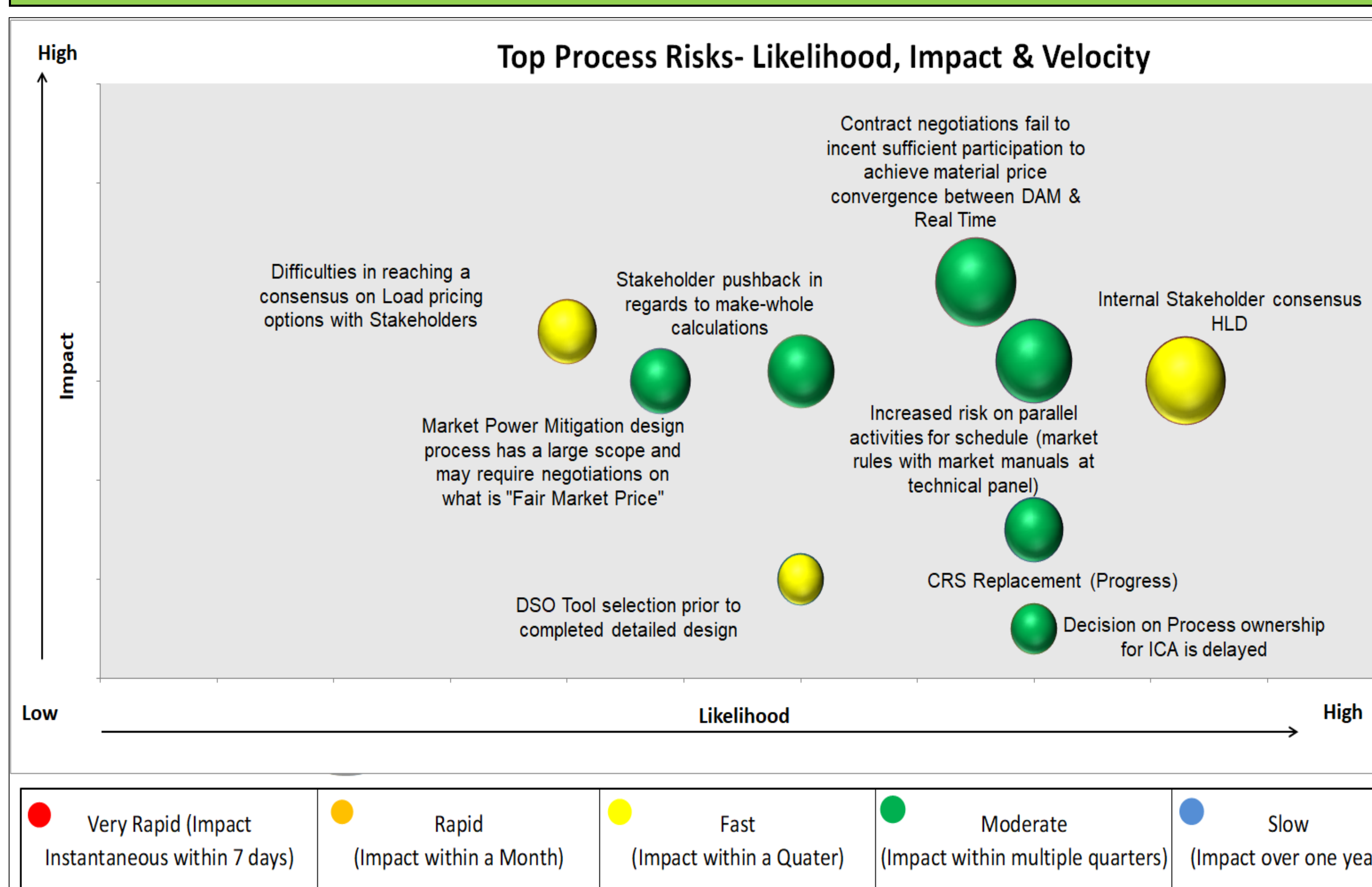
#### External Risks - Risk Velocity



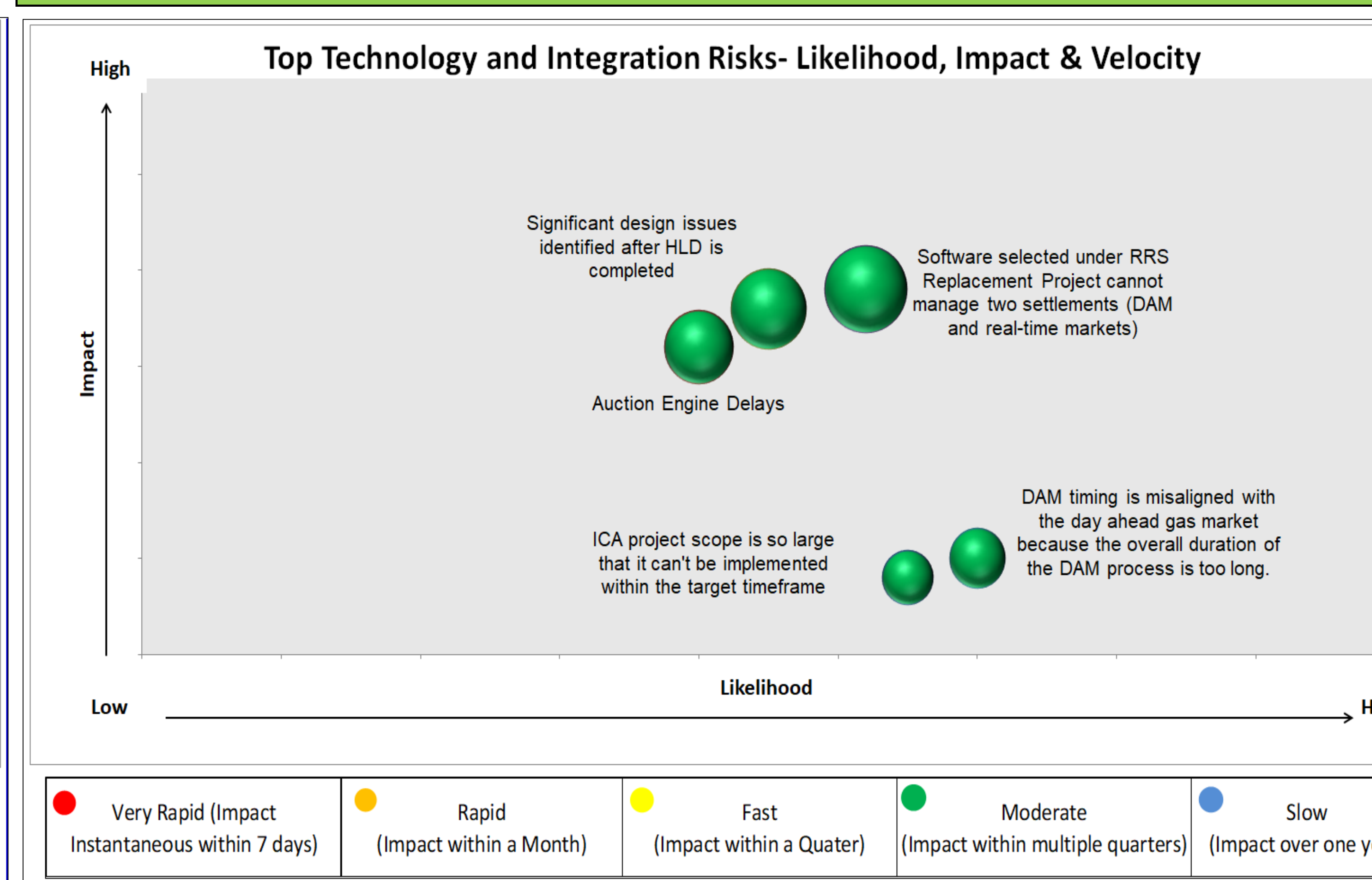
#### Resource Risks - Risk Velocity



#### Process Risks - Risk Velocity



#### IT & Integration - Risk Velocity



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# MARKET RENEWAL PROGRAM

## Program Status Summary

### Schedule

The program is overall slightly behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.95. This value is in the Green category. Within the program, the Energy work stream SPI is 0.79 (Yellow); the Capacity work stream SPI is 1.17 (Green).

### Cost

The program is under budget, with a cumulative Cost Performance Index (CPI) of 2.75. The Energy work stream CPI is 2.37 while the Capacity work stream CPI is 3.24.

### Risk

Risk consultant, KPMG, continues working jointly with the MRP and Enterprise Risk teams. MRP Risk observations and recommendations draft report completed. Findings to be presented to the Board of Directors at the February meeting.

### Upcoming Milestones

The high-level design documents for the Day-Ahead Market and Enhanced Real-Time Unit Commitment were published for external stakeholder feedback on December 20. Feedback is due on February 28.

The draft high-level design for the Incremental Capacity Auction was circulated for internal stakeholder feedback in December and feedback was due on January 29.

Schedule, Cost, Risk, and Milestone data as of January 31, 2019.

Prepared: February 14, 2019

MRESC Meeting: February 19, 2019

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**Program: MRP-Market Renewal Program**

Monthly Cost Report for MRESC  
February 13, 2019

Document Ref. No.: PRG\_MCR01

**Period: Month Ending  
31-Jan-19**

<b>Program Cost Summary:</b>							
	2017 <sup>(1)</sup>		2018 <sup>(1)</sup>		2019 <sup>(1)</sup>		
	Operating	Capital	Operating	Capital	Operating	Capital	Total <sup>(3)</sup>
Business Plan Approved Costs	9,247		12,700	4,000	11,140	34,208	45,348
Contingency	2,760				526	3,792	4,318
<b>Business Plan with Contingency</b>	<b>12,007</b>		<b>12,700</b>	<b>4,000</b>	<b>11,666</b>	<b>38,000</b>	<b>49,666</b>
Forecast	7,972		14,893	1,151			
2019 Forecast					10,029	33,878	43,907
Contingency				90	526	3,792	4,318
<b>Forecast with Contingency</b>	<b>7,972</b>		<b>14,893</b>	<b>1,241</b>	<b>10,555</b>	<b>37,670</b>	<b>48,225</b>
Actual Costs <sup>(2)</sup>	7,902	201	14,781	1,398	859	389	1,248
Contingency							
<b>Actual with Contingency</b>	<b>7,902</b>	<b>201</b>	<b>14,781</b>	<b>1,398</b>	<b>859</b>	<b>389</b>	<b>1,248</b>

Notes:

(1) Report in thousands (000's).

(2) Actual costs for 2019 are YTD.

3) Total shows combined operating and capital costs for current year.

<b>Life to Date Actuals - MRP Program</b>			
<b>Year</b>	<b>Operating</b>	<b>Capital</b>	<b>Total</b>
2017	7,902	201	8,103
2018	14,781	1,398	16,179
2019 (YTD)	859	389	1,248
<b>Total</b>	<b>23,543</b>	<b>1,988</b>	<b>25,531</b>

## MRP - Capital Financial Summary - 31-Jan-19

The capital costs approved under the 2019 Business Plan is to capture the capital expenditures incurred for the Energy and Capacity workstreams during the Detailed Design phase throughout 2019.

### Variance Summary:

For 2019 Actual costs are being tracked against the Approved Business Plan. Actuals are lower than budget as January Labour reports 2.4 weeks of effort per Finance reporting.

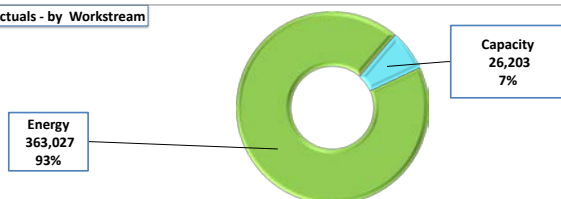
Note: For 2019 a Forecast Tracker has been added to the report to track and report variances between the approved Budget and the cost forecast.

### Overview of MRP Monthly Costs:

31-Jan-19

MRP Capital Costs								Year to Date					
Project Name	Business Plan Approved Costs	Monthly						YTD Business Plan Approved Costs	YTD 2019 Forecast	YTD Actual	YTD Actual vs Budget	Variance %	YTD Status
		2019 Forecast	Actual	Variance Actual vs Budget	Variance %	Status for 31-Jan-19	Comments						
Energy	\$747,797	\$536,797	\$363,027	(\$384,770)	(51%)	Below Budget		\$747,797	\$536,797	\$363,027	(\$384,770)	(51%)	Below Budget
Capacity	\$174,532	\$62,500	\$26,203	(\$148,329)	(85%)	Below Budget		\$174,532	\$62,500	\$26,203	(\$148,329)	(85%)	Below Budget
<b>Total Program</b>	<b>\$922,330</b>	<b>\$599,297</b>	<b>\$389,230</b>	<b>(\$533,100)</b>	<b>(58%)</b>	<b>Below Budget</b>		<b>\$922,330</b>	<b>\$599,297</b>	<b>\$389,230</b>	<b>(\$533,100)</b>	<b>(58%)</b>	<b>Below Budget</b>

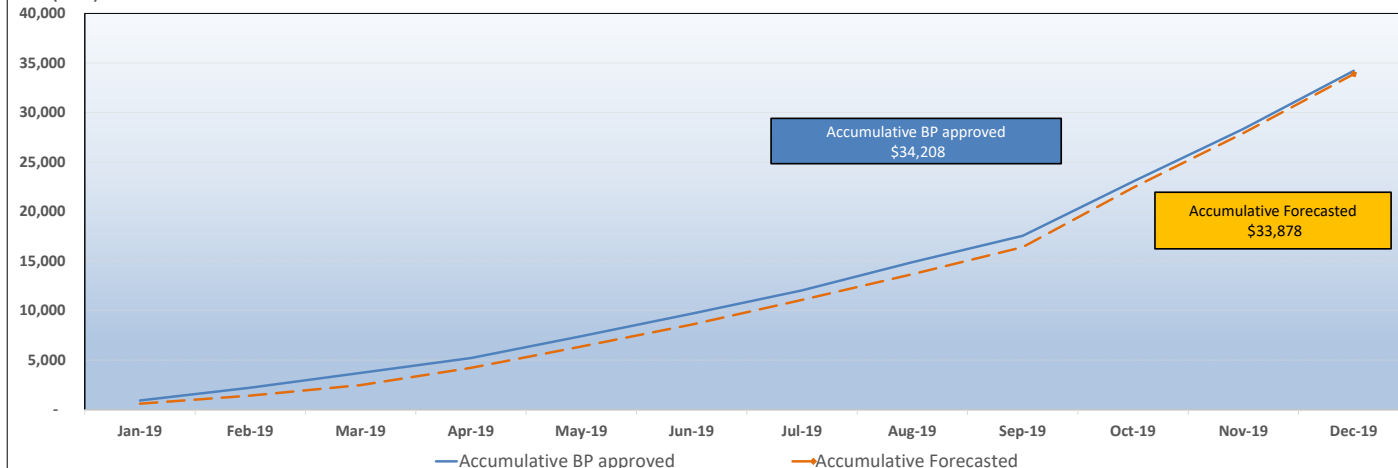
### Monthly Actuals - by Workstream



Notes: Capacity is still finalizing the High level Design documents resulting in minimal Capital spend.

Accumulative Total  
(000's)

### Budget vs Forecast Variance - Capital

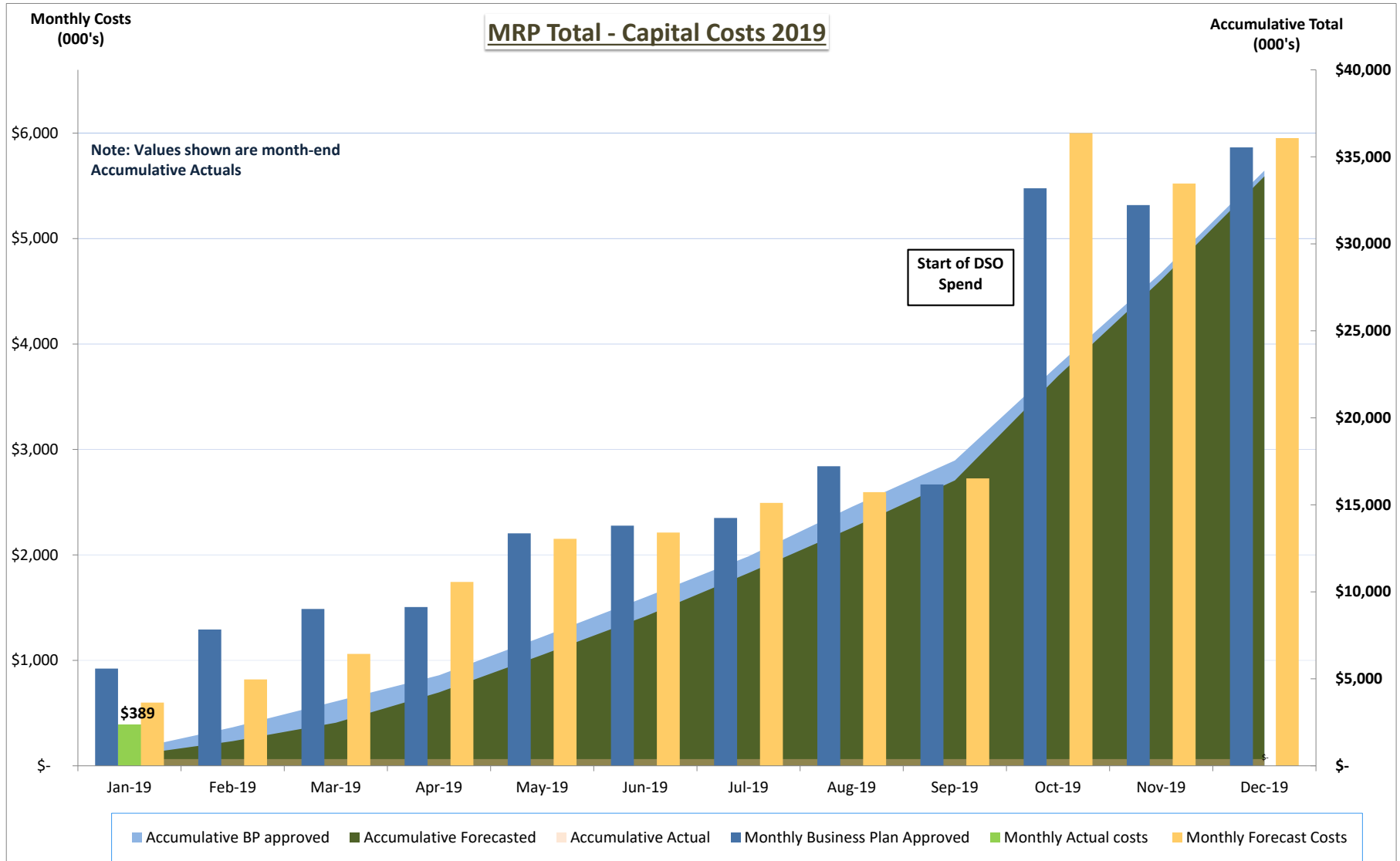


### Budget vs Forecast Tracker

Energy													
Category	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	More employees charging to Capital than anticipated (Jan - Dec)	\$620											
Detailed Design Consultants	Reflect procurement delays in onboarding consultant - Jan & Feb	(\$480)											
Rent	50% Reallocation from Opex	\$348											
<b>Net Change Energy</b>		<b>\$488</b>											
Capacity													
Category	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Remove ICA labour from forecast for Q1	(\$792)											
Rent	Added for May - Dec	\$232											
Rental Facility	No Stakeholdering Events	(\$18)											
Software	Removed ICA Auction Engine forecast - Jan & Feb	(\$240)											
<b>Net Change Capacity</b>		<b>(\$818)</b>											
<b>Combined Revision</b>		<b>(\$330)</b>											

### Monthly Comparison - 2019 Capital Actuals

Project	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD
Energy	363,027												363,027
Capacity	26,203												26,203
<b>Total</b>	<b>389,230</b>	-	-	-	-	-	-	-	-	-	-	-	<b>389,230</b>



## MRP - Operating Financial Summary - 31-Jan-19

The operating expenses approved under the 2019 Business Plan captures the non-capital costs incurred during the Detailed Design phase of the program throughout 2019.

### Variance Summary:

For 2019 Actual costs are being tracked against the Approved Business Plan.

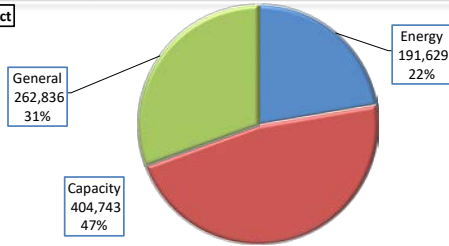
Note: For 2019 a Forecast Tracker has been added to the report to track and report variances between the approved Budget and the cost forecast.

### Overview of MRP Monthly Costs:

31-Jan-19

MRP Operating Costs								Year to Date					
Monthly													
Project Name	Business Plan Approved Costs	2019 Forecast	Actual	Variance Actual vs Budget	Variance %	Status for 31-Jan-19	Comments	YTD Business Plan Approved	YTD 2019 Forecast	YTD Actual	YTD Actual vs Budget	Variance %	YTD Status
Energy	\$36,648	\$158,236	\$191,629	\$154,981	423%	Above Budget		\$36,648	\$158,236	\$191,629	\$154,981	423%	Above Budget
Capacity	\$618,117	\$447,117	\$404,743	(\$213,374)	(35%)	Below Budget		\$618,117	\$447,117	\$404,743	(\$213,374)	(35%)	Below Budget
General	\$283,207	\$273,756	\$262,836	(\$20,371)	(7%)	Below Budget		\$283,207	\$273,756	\$262,836	(\$20,371)	(7%)	Below Budget
<b>Total Program</b>	<b>\$937,972</b>	<b>\$879,110</b>	<b>\$859,208</b>	<b>(\$78,764)</b>	<b>(8%)</b>	<b>Below Budget</b>		<b>\$937,972</b>	<b>\$879,110</b>	<b>\$859,208</b>	<b>(\$78,764)</b>	<b>(8%)</b>	<b>Below Budget</b>

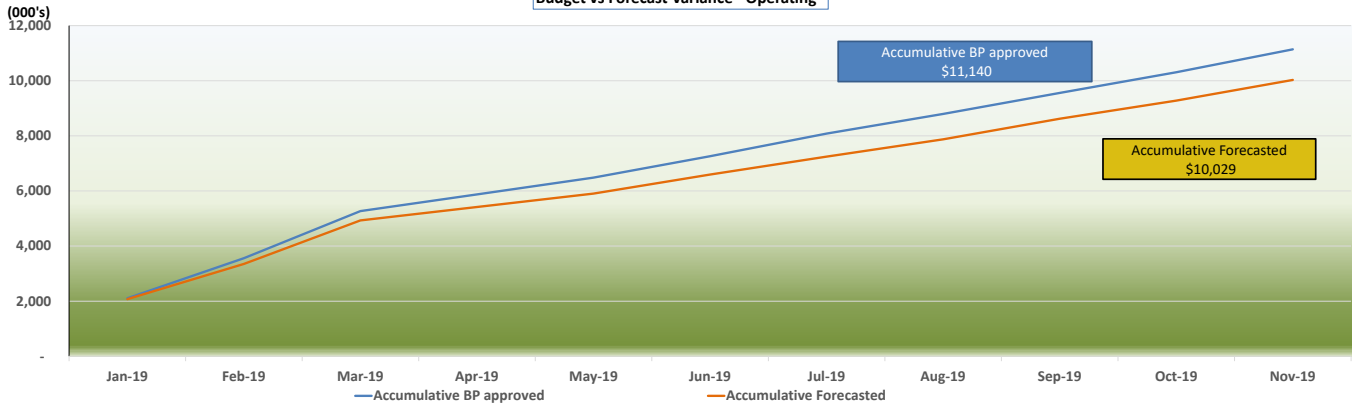
### Monthly Actual Costs by Project



Notes: As expected Capacity accounts for relatively 50% of the Operating costs as the team continues to work on High Level Designs. Energy has a higher operating costs than budgeted as consultants continue to finalize the Energy High Level Designs.

### Accumulative Total

### Budget vs Forecast Variance - Operating

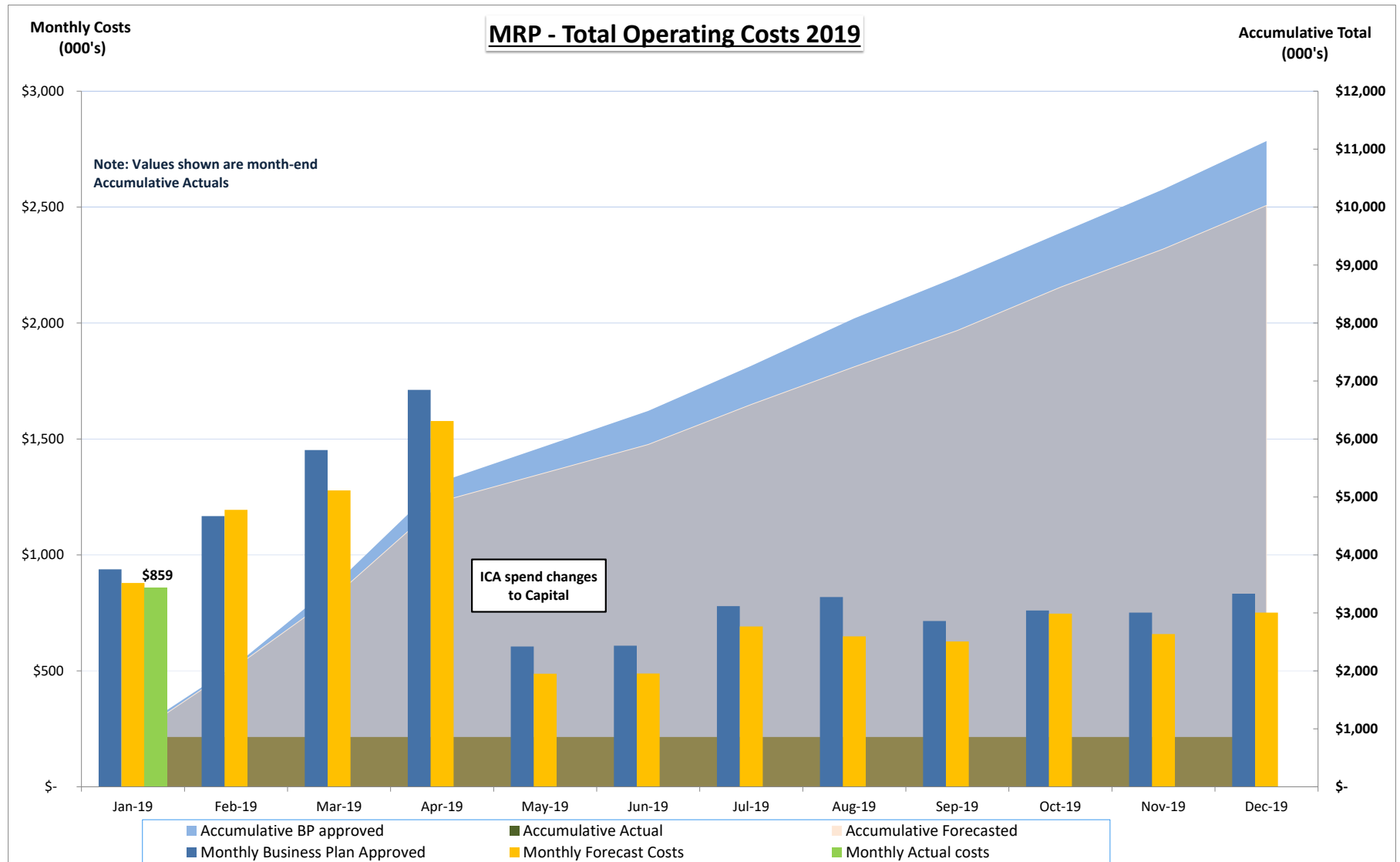


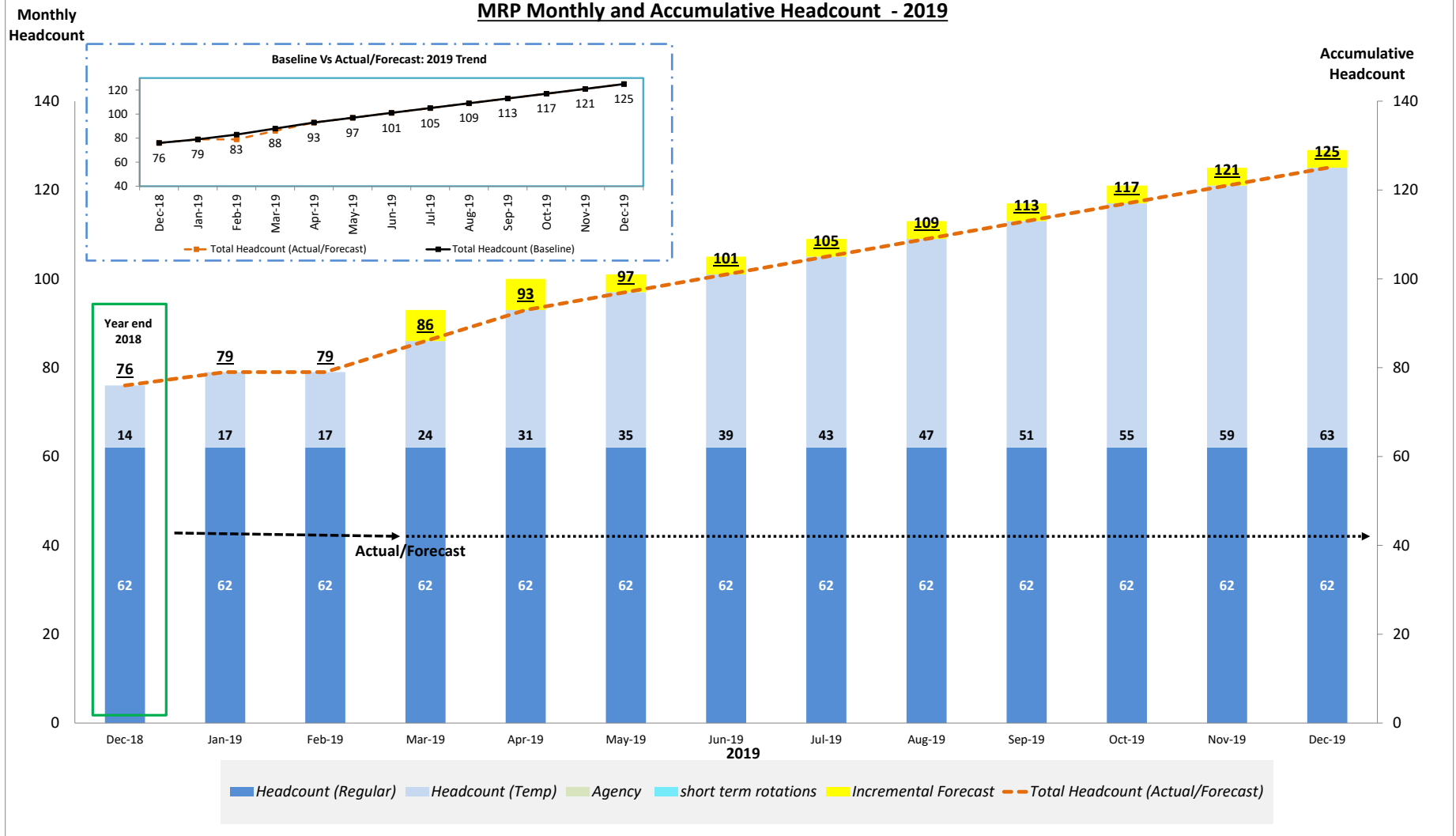
### Budget vs Forecast Tracker

Energy													
	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Revised labour based on current projections	(\$79)											
Consultants	Added to forecast for continued High Level Design work	\$148											
	<b>Net Change Energy</b>	<b>\$69</b>											
Capacity													
	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Revised labour based on current projections	(\$683)											
Rent	Reallocated from General (Jan - Apr)	\$116											
	<b>Net Change Capacity</b>	<b>(\$567)</b>											
General													
	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Included Society Allowance	\$84											
Rent	Reallocated to workstreams	(\$696)											
	<b>Net Change Capacity</b>	<b>(\$612)</b>											
	<b>Combined Revision</b>	<b>(\$1,110)</b>											

### MRP Monthly Comparison - 2019 Operating Actuals

Project	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD
Energy	191,629												191,629
ICA	404,743												404,743
General	262,836												262,836
<b>Total</b>	<b>859,208</b>	-	-	-	-	-	-	-	-	-	-	-	<b>859,208</b>

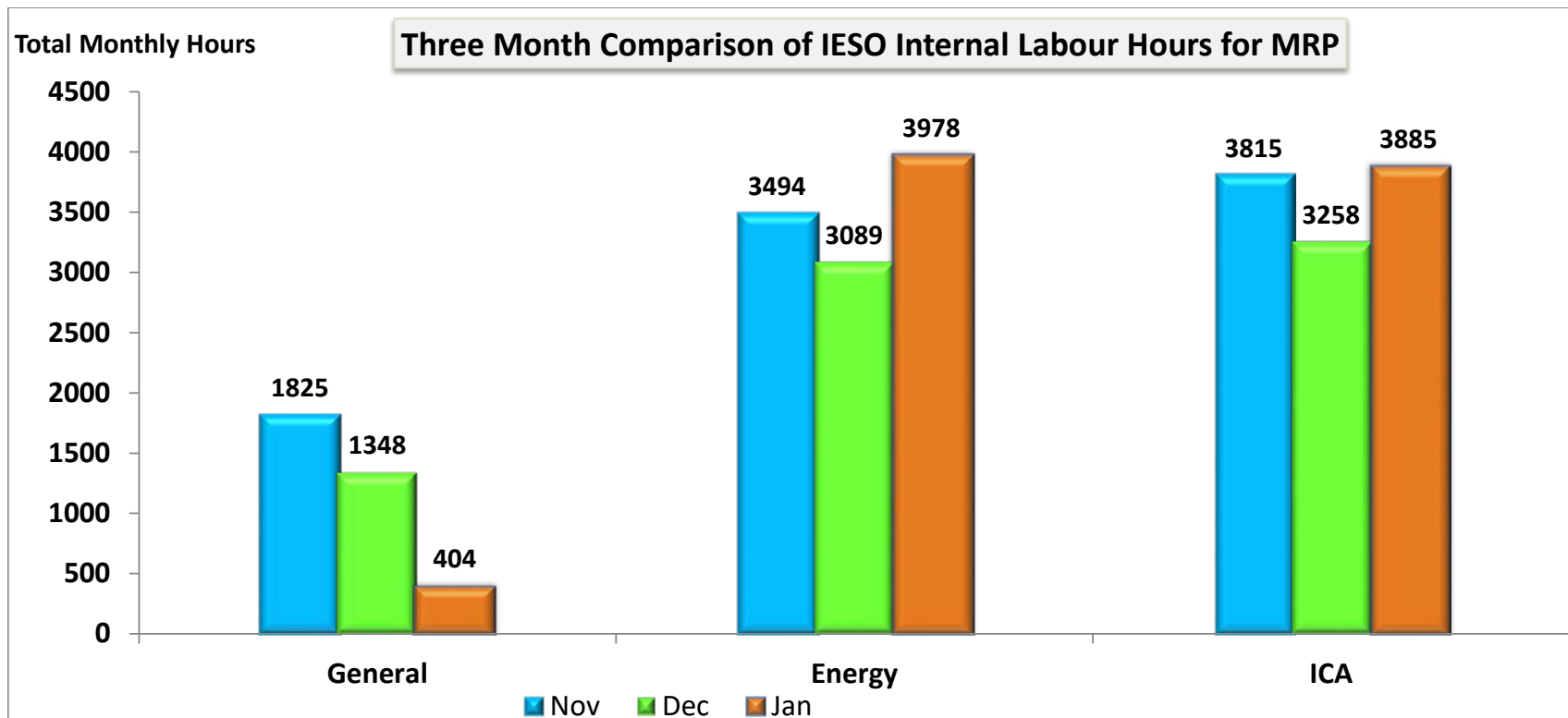




**Notes For Actuals:** Jan changes: (3) Two Snr Planner (Temp) ICA, amd 1 Market Advisor (Temp) ICA

Feb changes: (0) hires:





Notes: January hours align with expectations among the two workstreams and the General account as the team ramps up effort on the program.

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**Program: MRP-Market Renewal Program**

**Project: Total MRP Program**

**Monthly Schedule Report for MRESC**  
*January 31, 2019*

**Document Ref. No.: MRP\_MSR01\_19-01-31**  
**(MSR ~ 01)**

**Project Commencement Reporting Date: Jan 1, 2018**  
**Project Completion Reporting Date: Dec 31, 2018**

Reporting Range Period	From <i>January 1, 2018</i>	<<<<<	>>>>>	To <i>January 31, 2019</i>
------------------------	--------------------------------	-------	-------	-------------------------------

For Week ending	<i>January 31, 2019</i>
-----------------	-------------------------

Reporting Date	<i>February 14, 2019</i>
----------------	--------------------------

**Program Schedule Status**

Schedule Baseline	Accumulative Planned % (Baseline)	Accumulative Actual %	Variation %	Schedule Variance <sup>(1)</sup>
	7.0%	6.6%	<i>(-0.3%)</i>	Under Threshold

Schedule Forecast	Accumulative Planned % (Forecast)	Accumulative Actual %	Variation %	Schedule Variance <sup>(1)</sup>
	6.9%	6.6%	<i>(-0.2%)</i>	Under Threshold

**Month End Project Performance Status**

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	<i>\$2,849,572</i>	<i>\$2,711,544</i>	<i>0.95</i>	Behind Schedule

Cost Performance (Energy & Capacity)	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	<i>\$985,602</i>	<i>\$2,711,544</i>	<i>2.75</i>	Under Budget

MRP Total Actual Cost	<i>\$1,248,438</i>
-----------------------	--------------------

**Legend for Status:**

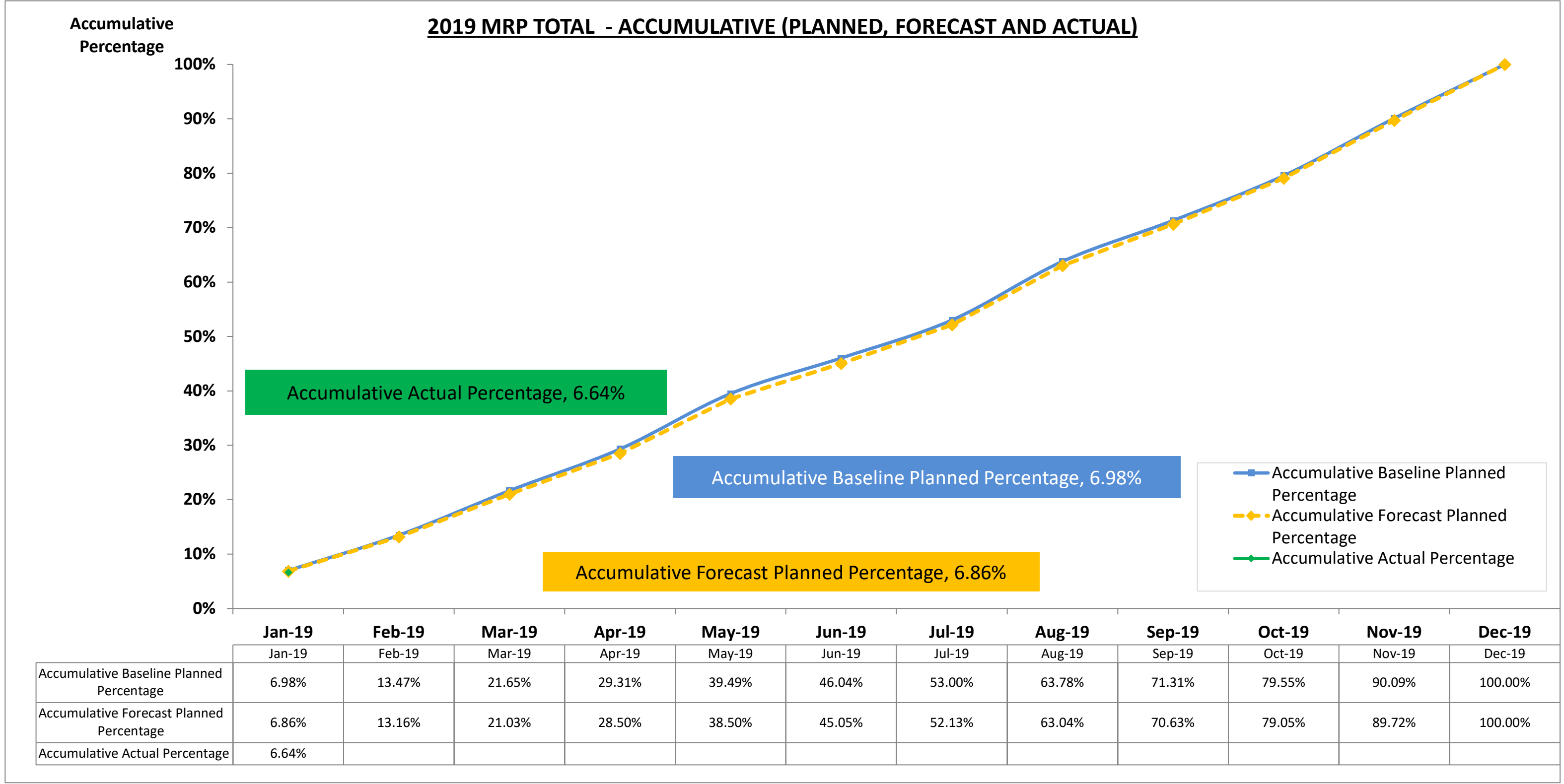
- (1). Threshold upper limit: assumption is -10%, If variation exceed (-10%) threshold limit schedule to be revised  
(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule" or if SPI=1 "On Schedule"  
(3). Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"

Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.



Monthly Status as of: 31-Jan-19

PROGRESS INDICATORS										PERFORMANCE INDICATORS			
MRP	2019 Total Budget at Completion (BAC) <sup>(1)</sup>	2019 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed	Variance <sup>(2)</sup> (-/+)	Earned Value (EV) <small>(BAC X Monthly Scheduled Actual Progress)</small>	Planned Value (PV) <small>(BAC X Monthly Scheduled Planned %)</small>	CPI (EV/AC)	SPI (EV/PV)
Energy	\$25,294,875	\$554,656	61.96%	01-Jan-18	31-Dec-18	6.55%	5.20%	3.22%	<span style="color: red;">(-1.4%)</span>	\$1,315,334	\$1,656,814	2.37	0.79
Capacity	\$15,530,704	\$430,946	38.04%	01-Jan-18	31-Dec-18	7.68%	8.99%	3.42%	<span style="color: blue;">+1.3%</span>	\$1,396,210	\$1,192,758	3.24	1.17
Energy & Capacity Sub Total	\$40,825,579	\$985,602	100.00%			6.98%		6.64%	<span style="color: red;">(-0.3%)</span>	\$2,711,544	\$2,849,572	2.75	0.95
General	\$4,522,164	\$262,836											
Total	\$45,347,743	\$1,248,438											

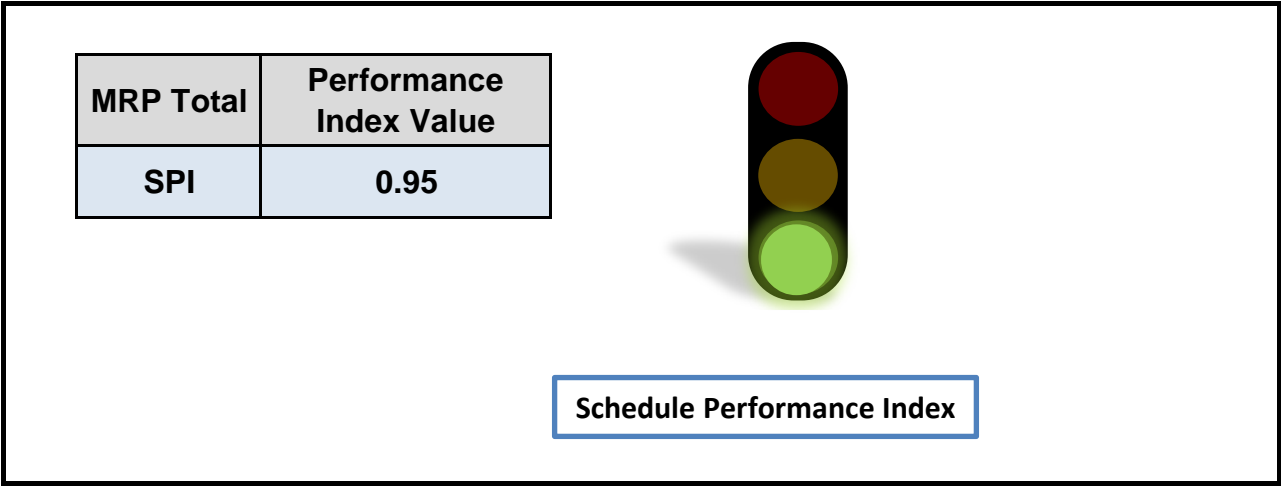


Notes
 

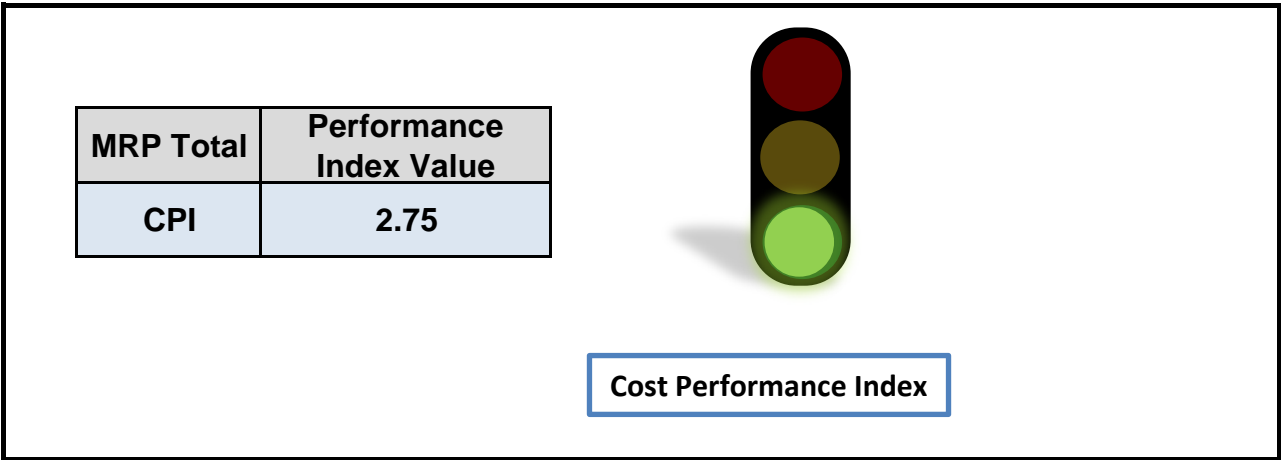
(1) 2019 Budget at Completion(BAC) values are used for computing the SPI and CPI
 (2) Overall Baseline Schedule Variance for MRP -0.3%



Monthly Performance Status: 31-Jan-19

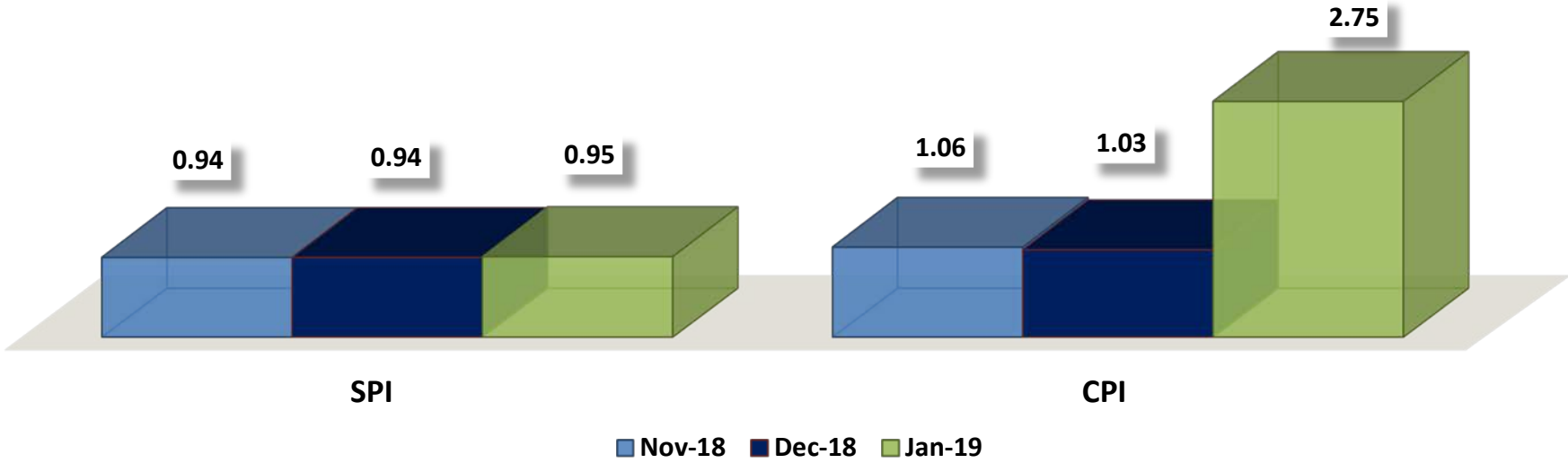


Threshold limits			
Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9

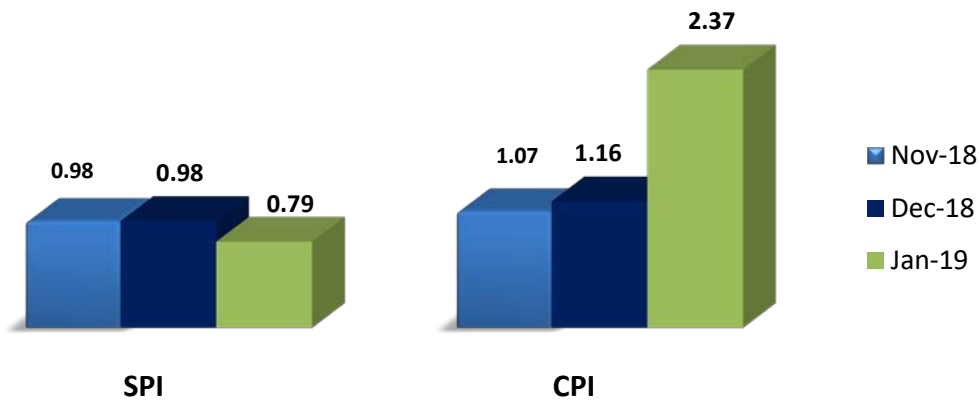


Three Month Rolling Performance Comparison

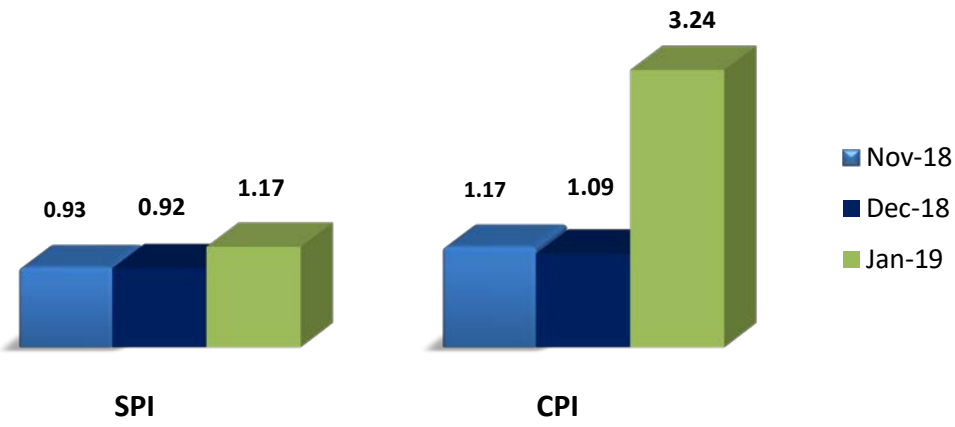
MRP-TOTAL



Energy



Capacity



PMI Definitions:

CPI (Cost Performance Index)

The cost performance index (CPI) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

SPI (Schedule Performance Index)

Schedule performance index (SPI) is a ratio of the earned value (EV) to the planned value (PV).  $SPI = EV \div PV$ . If the SPI is less than one, it indicates that the project is potentially behind schedule to-date whereas an SPI greater than one, indicates the project is running ahead of schedule



MRP Progress Curves Comparisons - Work effort vs Cash flow





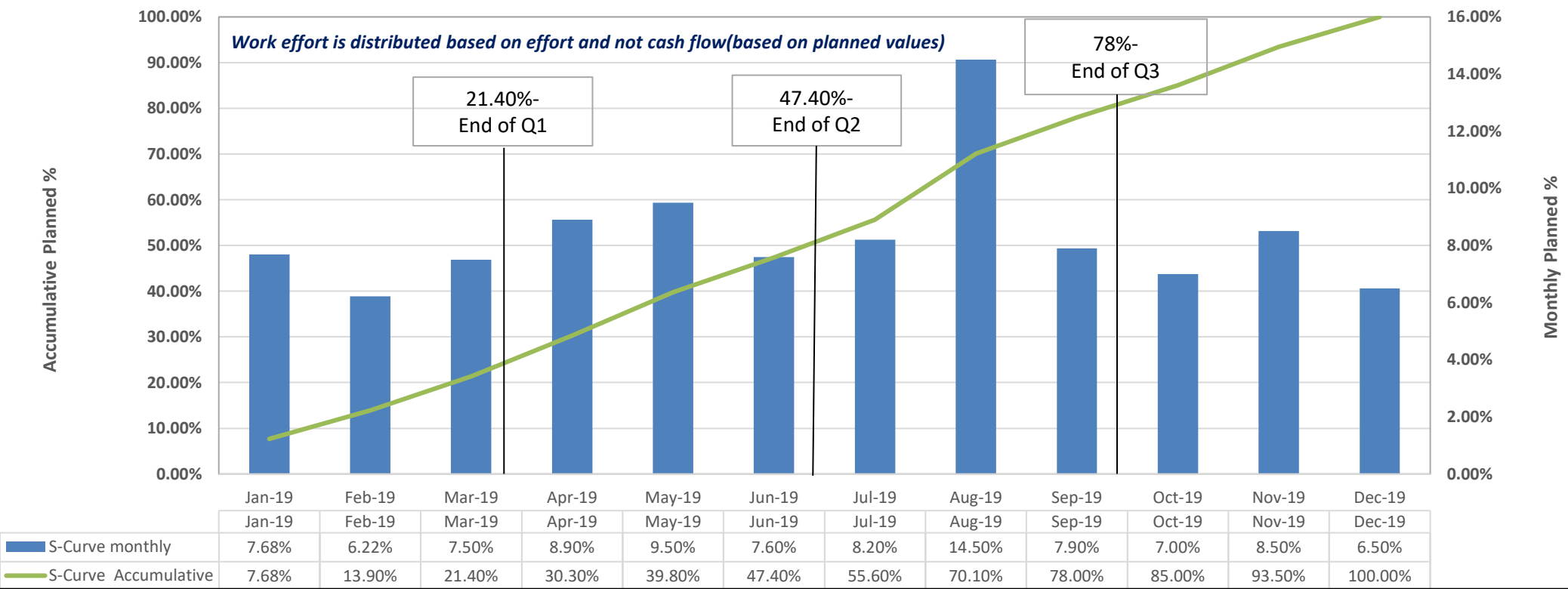
MRP Energy Progress Curves Comparisons - Work effort vs Cash flow



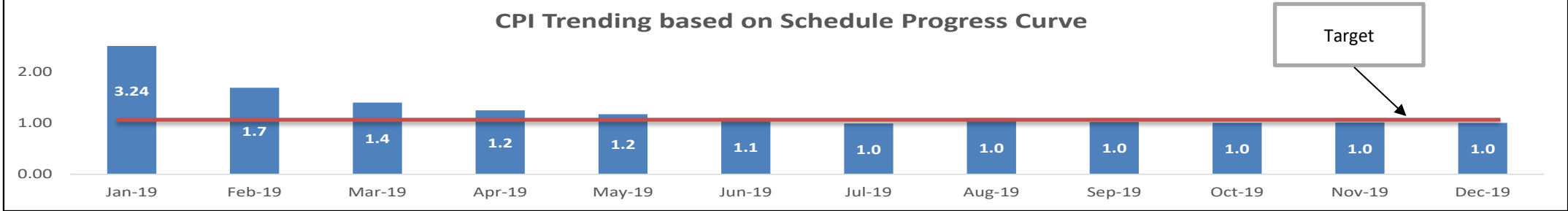


MRP Capacity Progress Curves Comparisons - Work effort vs Cash flow

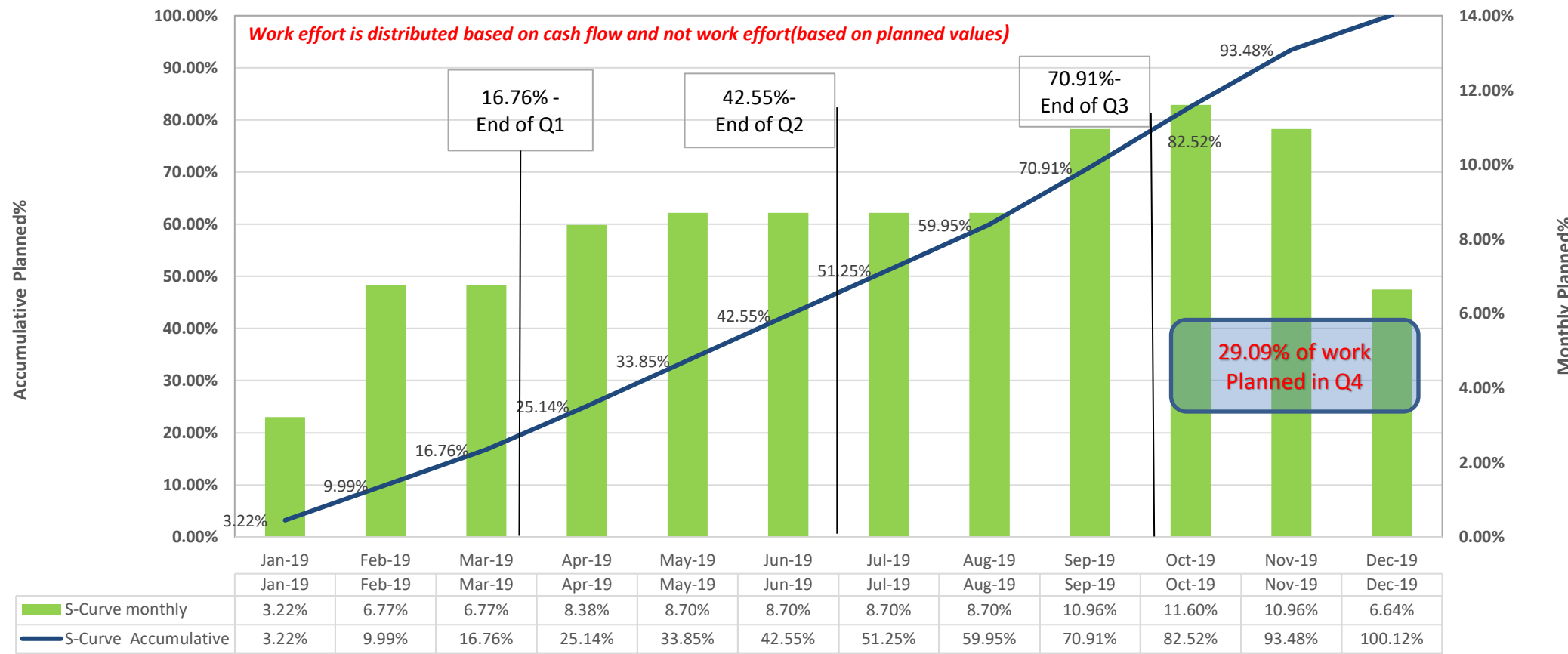
MRP Capacity -Schedule Progress Curve (S-Curve) - Preferred Approach



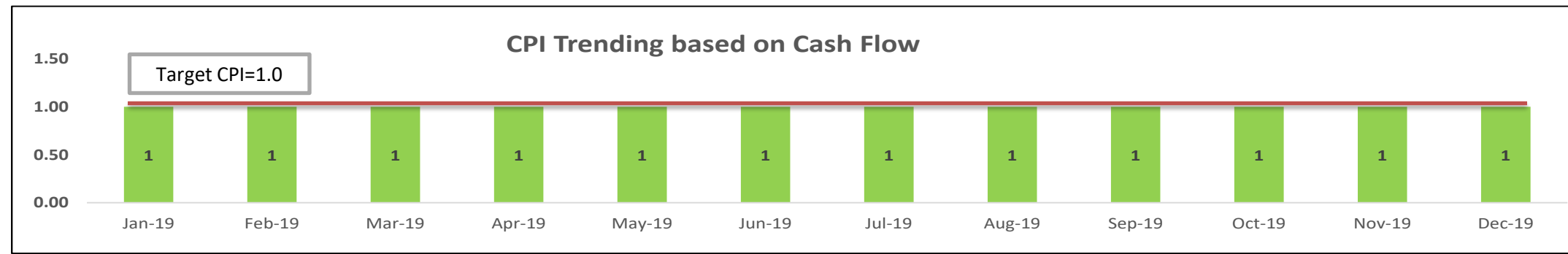
CPI Trending based on Schedule Progress Curve



MRP Capacity -Schedule Progress Curve based on Cash flow



CPI Trending based on Cash Flow





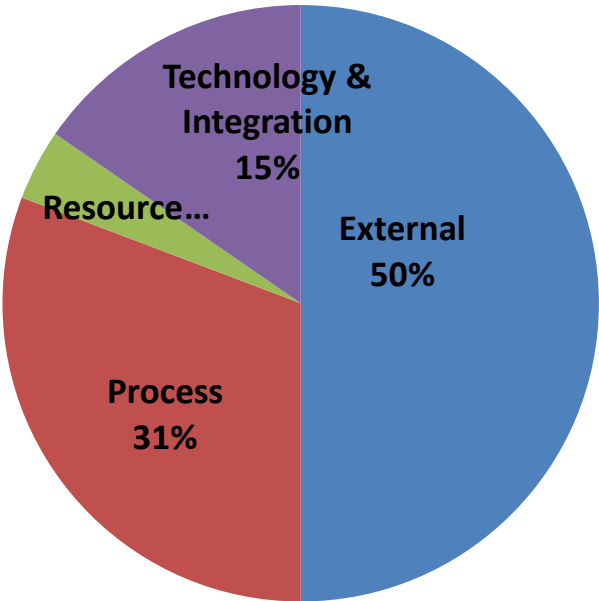
Program: MRP-Market Renewal Program

Monthly Risk Report For MRESC  
January 31, 2019

Document Ref. No.: PRG\_MRR09

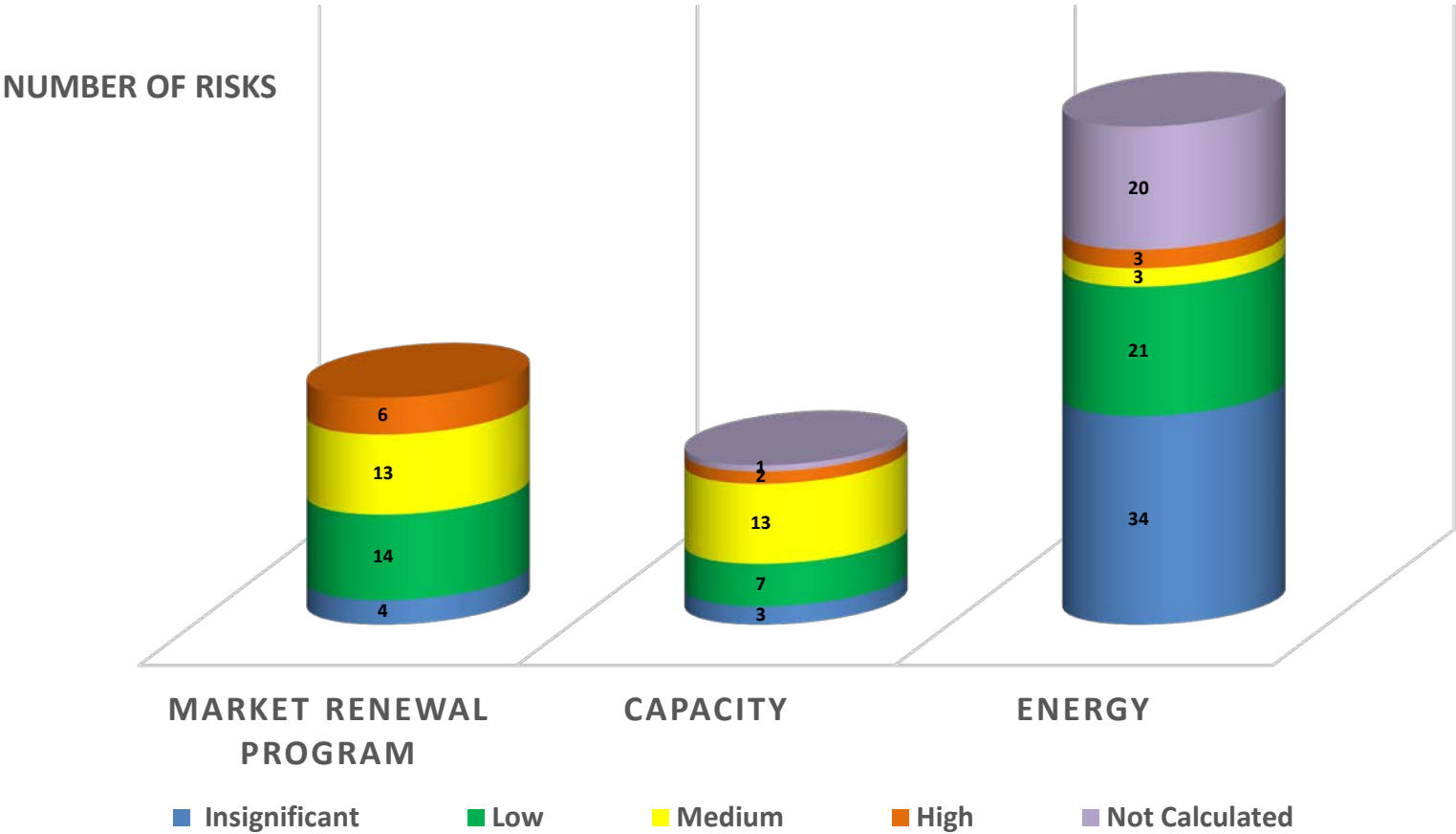
Period: Month Ending: 31-Jan-19

MRP - Total Residual Risk By Category



All program and project risks have been categorised into four categories, with the largest category of risks being categories as "External" risks.

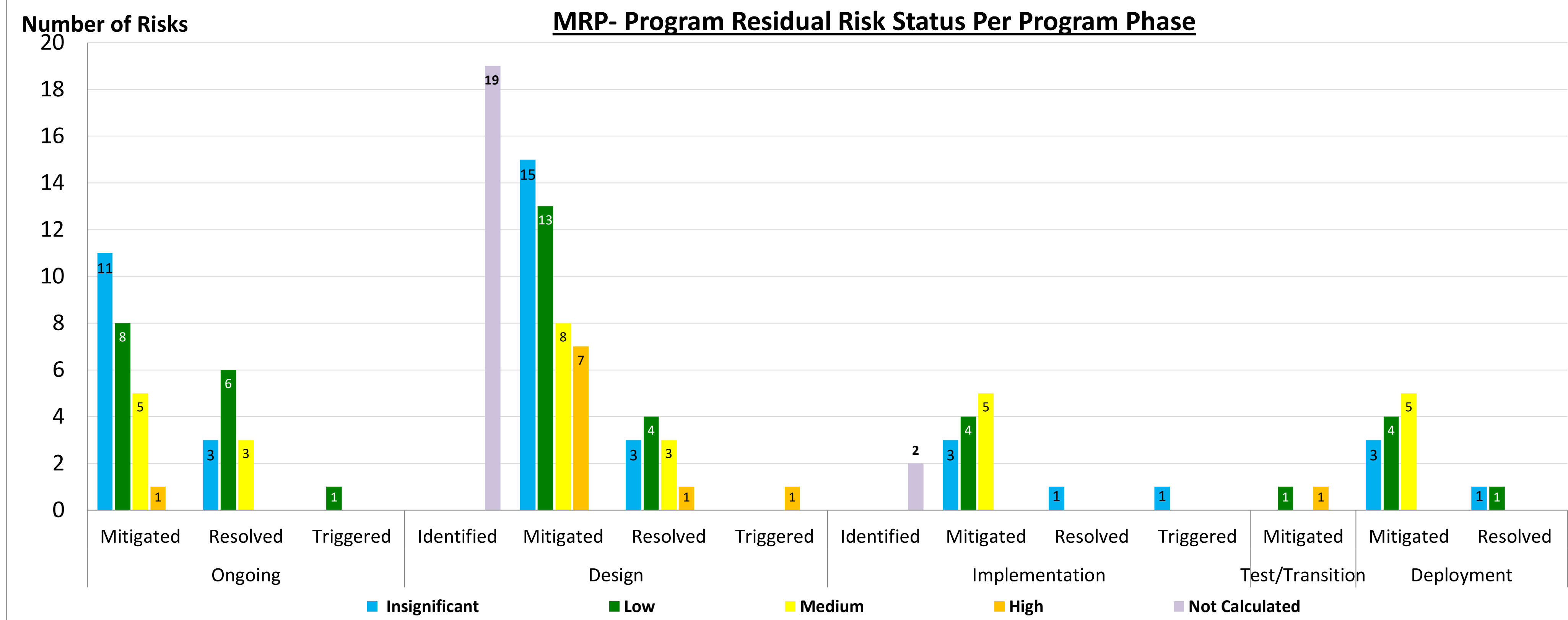
MRP - TOTAL RESIDUAL RISK BY WORKSTEAM



All MRP Risks have been divided into the two workstreams Energy, ICA, and MRP Program risks. Each identified risk was assessed with the project team, and the document the risk response tasks that will be implemented proactively to prevent or at least reduce the level of the identified risk. In total we currently have 144 Risks



MRP RISK SUMMARY - MRESC as of Jan 31,2019								
TOP MRP CONTROLABLE RISKS - OPEN								
Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R027	Market Renewal Program	Design	External	OEB indicates they are not properly informed about the new market design.	High	Regulatory Affairs is leading all engagement with OEB and keeping Market Strategy group informed of meeting dates/materials. Targeted outreach (ad-hoc CEO updates, quarterly executive team updates, monthly staff updates etc.)	Mitigated	▬
MRP_R037	Market Renewal Program	Design	External	New Government adversely impacting MRP scope or schedule	High	Frequent communication with government to ensure alignment as much as possible.	Mitigated	▬
ICA_R024	Capacity - ICA	Design	Process	Lack of clarity regarding division of accountability between ICA Team and line of business	High	Engage internal stakeholders regarding roles and responsibilities of line staff vs. the ICA Team	Mitigated	⬇
DAM_R012	Energy - DAM	Design	Process	Contracted or rate-regulated participants may be resistive to DAM participation rules and two-settlement outcomes	High	Develop a strategic engagements plan with the SE team	Mitigated	▬
DAM_R007	Energy - DAM	Design	Process	Contract negotiations fail to incent sufficient participation to achieve material price convergence between DAM & Real Time	High	Ensure full participants engaging/soliciting on design features to ensure design will incentivize (price certainty, overall lower cost, etc...)	Mitigated	▬
MRP_R005	Market Renewal Program	Ongoing	Process	Difficulty reaching agreement with internal stakeholders (Change Management).	High	Operations and IT Leads assigned to reduce the impact as they are representing their respective areas. Director's Forum is setup to facilitate these escalations. Final step for resolution is the MRESC	Mitigated	⬇
MRP_R003	Market Renewal Program	Ongoing	Process	Critical interdependencies with other projects (e.g. CRS Replacement)	High	MRP Representation on dependent projects and representation on PSC. MRP leads and BA's to work with dependant projects to identify any impacts during design phase.	Mitigated	▬
ICA_R019	Capacity - ICA	Test/Transition	Process	The need for parallel activities on timeline (e.g. market rules with market manuals at technical panel)	High	Start activities as early as possible.	Mitigated	▬
MRP_R015	Market Renewal Program	Implementation	Technology & Integration	Design decisions need to be revisited due to technical limitations	High	IT Lead and resources have been introduced early on the program to reduce the likelihood and impact of this occurring. Furthermore software vendors will be part of the HLD.	Mitigated	▬
TOP MRP CONTROLABLE RISKS - RESOLVED								
Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R022	Market Renewal Program	Design	Process	Business Case approvals - approval delays could cause release of Capital expenditure for Detail work on Energy and Capacity work streams	High	Finance has proposed capitalisation expenditure rules that are referencing that the preliminary project stage is completed, and Management, with the relevant authority, implicitly or explicitly authorizes and commits to funding a computer software project. Instead of an approved business case.	Resolved	▬



**Updates on KPMG Risk Assessment**

\*MRP Risk observations and recommendations report completed, and will be presented to the Audit committee on February 26.

\* Continue to work on preparing management responses, ownership and timelines for Risk report.

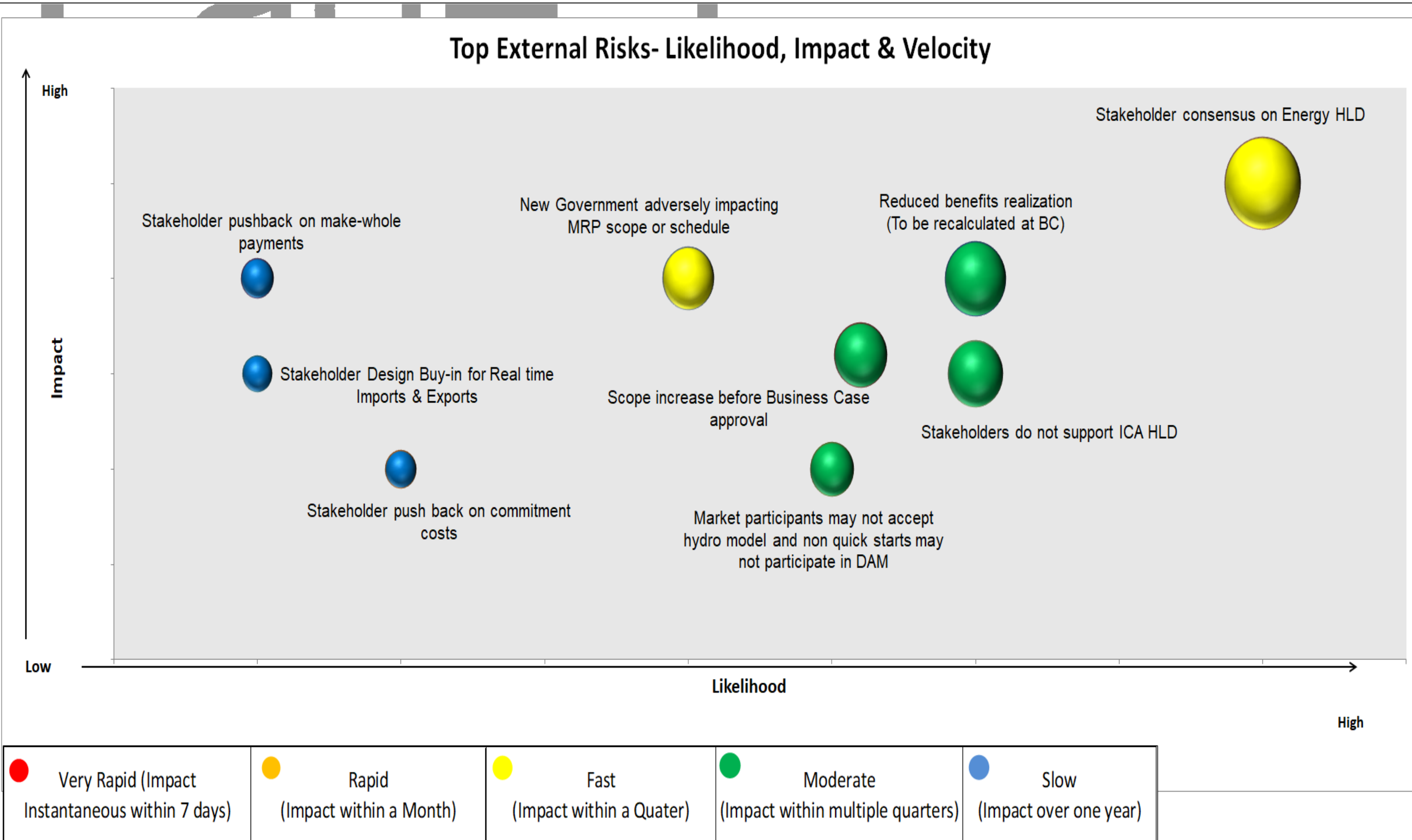
\* Additional Risk Training provided for New MRP Hires since June 2018, and the Enterprise Change group (Project mangers and Business Analysts) - completed on Jan 30.



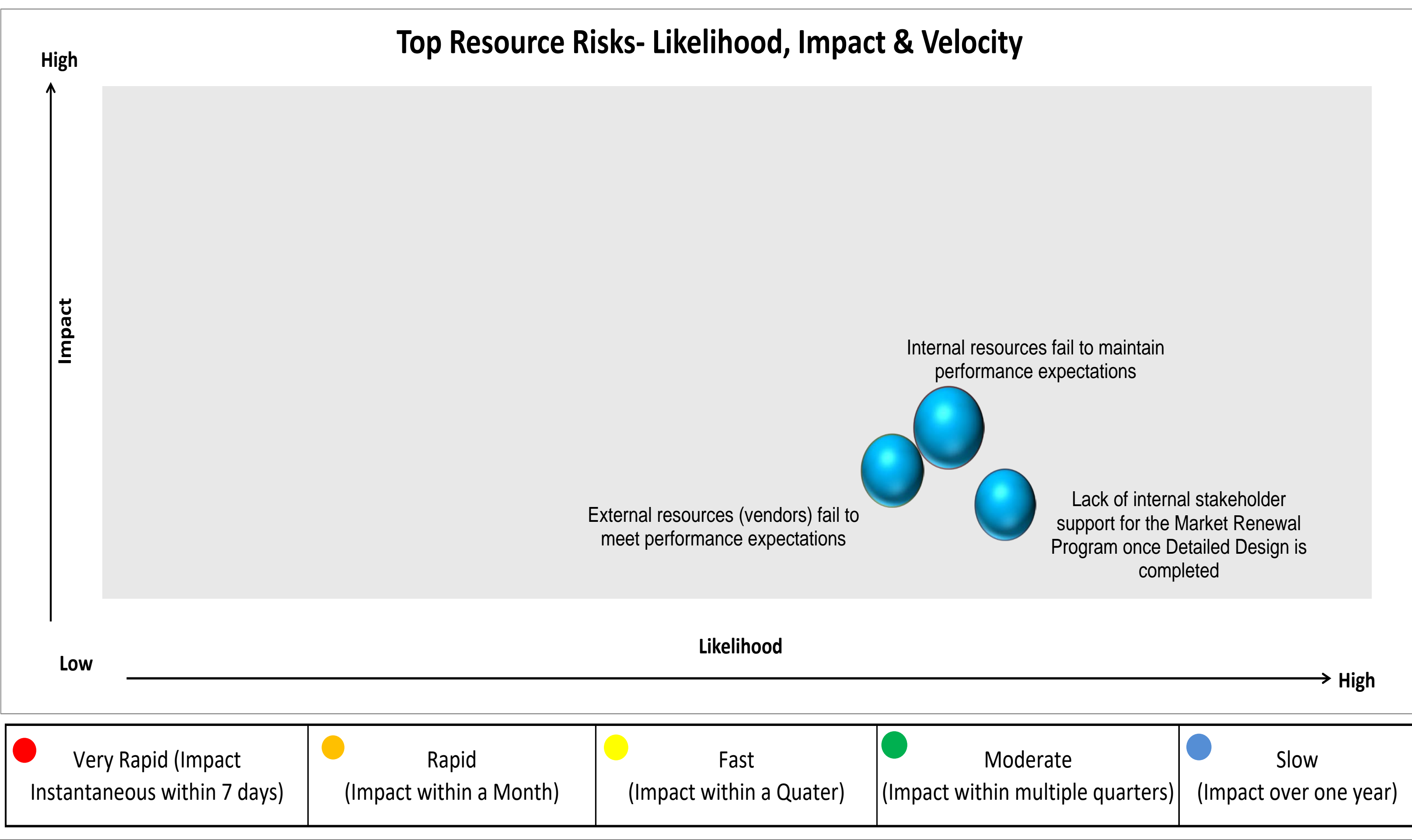
**MRP RISK SUMMARY - MRESC as of Jan 31,2019**

**RISK VELOCITY PER CATEGORY**

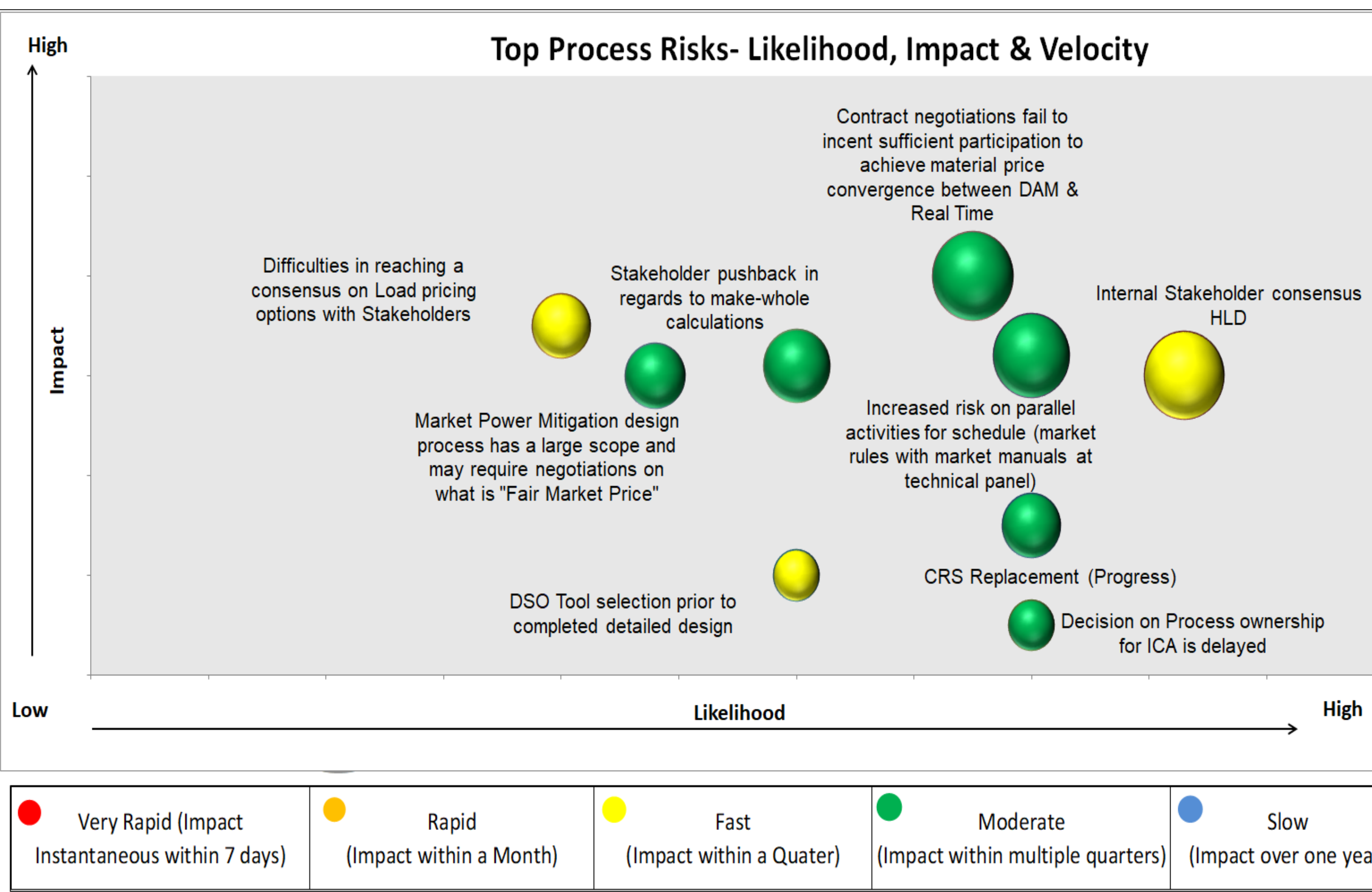
**External Risks - Risk Velocity**



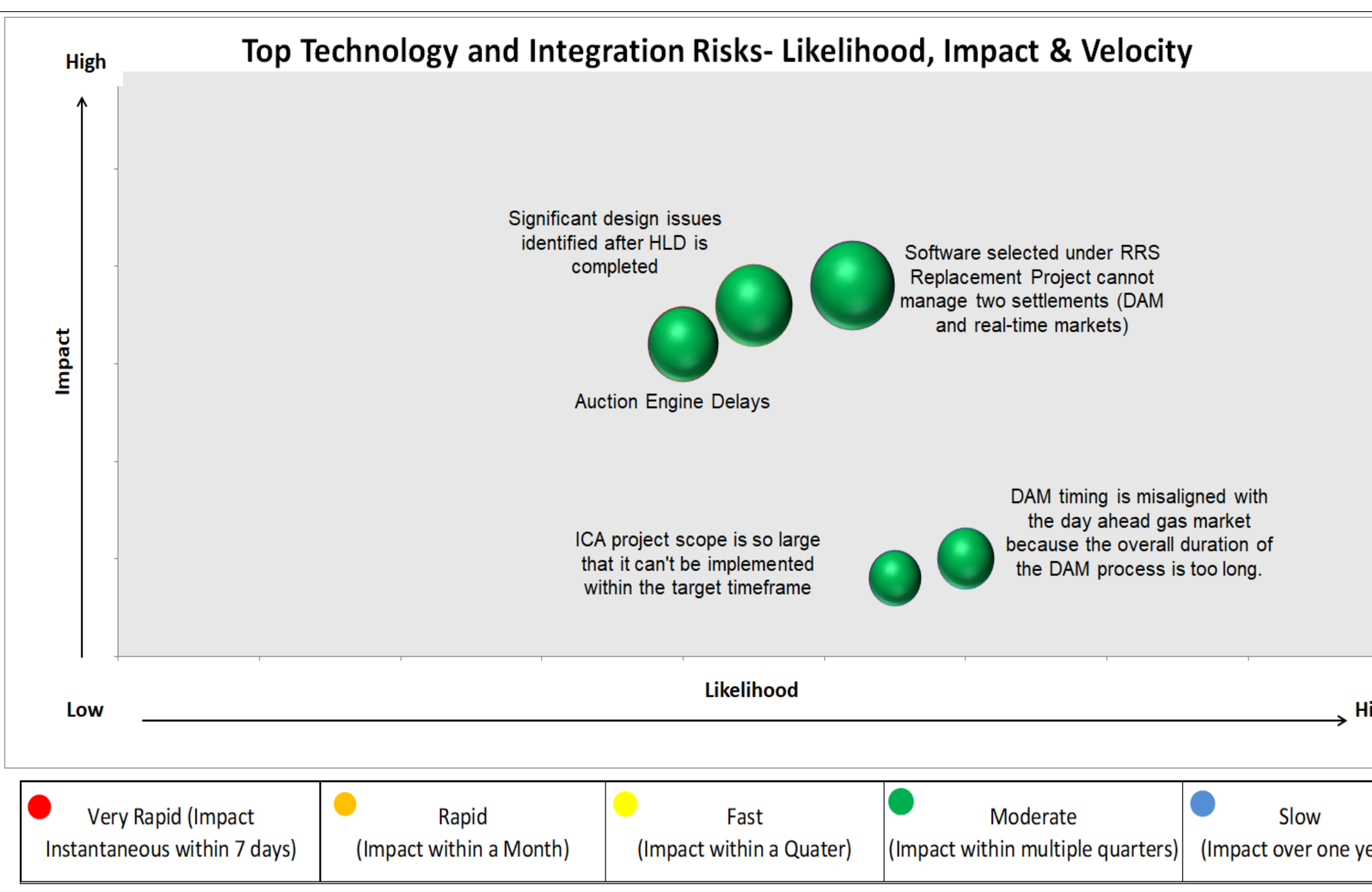
**Resource Risks - Risk Velocity**



**Process Risks - Risk Velocity**



**IT & Integration - Risk Velocity**



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# MARKET RENEWAL PROGRAM Program Status Summary

<b>Overall Program</b>	<i>Previous Month</i>	<b>G</b>	<i>Current Month</i>	<b>Y</b>	<i>Overall Trend</i>	↓
------------------------	-----------------------	----------	----------------------	----------	----------------------	---

<b>Schedule (SPI)</b>	<i>Previous Month</i>	0.95	<b>G</b>
	<i>Current Month</i>	0.79	<b>Y</b>
	<i>Overall Trend</i>		↓
	<p>The program is overall behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.79. This value is in the Yellow category. Within the program, the Energy work stream SPI is 0.70 (Yellow); the Capacity work stream SPI is 0.92 (Green).</p>		

<b>Cost (CPI)</b>	<i>Previous Month</i>	2.75	<b>G</b>
	<i>Current Month</i>	1.94	<b>G</b>
	<i>Overall Trend</i>		→
	<p>The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.94. The Energy work stream CPI is 1.68 while the Capacity work stream CPI is 2.35.</p>		

<b>Risk</b>
MRP Risk observations and recommendations presented to the Audit committee on February 26. Working with KPMG on draft key Program risks and responses for MRP Business Case. Drafting of next phase interviews, that include risk assessment for Business Analysis, Project Management and IT&S.

<b>Upcoming Milestones</b>
The high-level design document for the Incremental Capacity Auction was published for external stakeholder feedback on March 22. Feedback is due on May 17.

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**Program: MRP-Market Renewal Program**

Monthly Cost Report for MRESC  
March 20, 2019

Document Ref. No.: PRG\_MCR02

**Period: Month Ending  
28-Feb-19**

<b>Program Cost Summary:</b>							
	2017 <sup>(1)</sup>		2018 <sup>(1)</sup>		2019 <sup>(1)</sup>		
	Operating	Capital	Operating	Capital	Operating	Capital	Total <sup>(3)</sup>
Business Plan Approved Costs	9,247		12,700	4,000	11,140	34,208	45,348
Contingency	2,760				526	3,792	4,318
<b>Business Plan with Contingency</b>	<b>12,007</b>		<b>12,700</b>	<b>4,000</b>	<b>11,666</b>	<b>38,000</b>	<b>49,666</b>
Forecast	7,972		14,893	1,151			
2019 Forecast					9,971	33,819	43,790
Contingency				90	526	3,725	4,251
<b>Forecast with Contingency</b>	<b>7,972</b>		<b>14,893</b>	<b>1,241</b>	<b>10,497</b>	<b>37,544</b>	<b>48,041</b>
Actual Costs <sup>(2)</sup>	7,902	201	14,781	1,398	1,847	854	2,701
Contingency							
<b>Actual with Contingency</b>	<b>7,902</b>	<b>201</b>	<b>14,781</b>	<b>1,398</b>	<b>1,847</b>	<b>854</b>	<b>2,701</b>
<b>% Spent - Program Budget</b>					<b>17%</b>	<b>2%</b>	<b>6%</b>

Notes:

(1) Report in thousands (000's).

(2) Actual costs for 2019 are YTD.

(3) Total shows combined operating and capital costs for current year.

<b>Life to Date Actuals - MRP Program</b>			
Year	Capital	Operating	Total
2017	201	7,902	8,103
2018	1,398	14,781	16,179
2019 (YTD)	854	1,847	2,701
<b>Total</b>	<b>2,453</b>	<b>24,531</b>	<b>26,984</b>



## MRP - Capital Financial Summary - 28-Feb-19

The capital costs approved under the 2019 Business Plan is to capture the capital expenditures incurred for the Energy and Capacity workstreams during the Detailed Design phase throughout 2019.

### Variance Summary:

For 2019 Actual costs are being tracked against the Approved Business Plan.

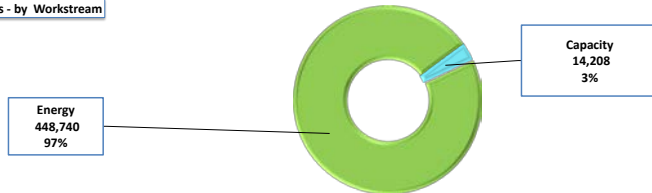
Note: For 2019 a Forecast Tracker has been added to the report to track and report variances between the approved Budget and the cost forecast.

### Overview of MRP Monthly Costs:

28-Feb-19

MRP Capital Costs								Year to Date					
Project Name	Business Plan Approved Costs	Monthly						YTD Business Plan Approved Costs	YTD 2019 Forecast	YTD Actual	YTD Actual vs Budget	Variance %	YTD Status
		2019 Forecast	Actual	Variance Actual vs Budget	Variance %	Status for 28-Feb-19	Comments						
Energy	\$1,067,501	\$758,501	\$448,740	(\$618,761)	(58%)	Under Budget		\$1,815,298	\$1,123,028	\$813,432	(\$1,001,866)	(55%)	Under Budget
Capacity	\$108,000	\$62,550	\$14,208	(\$93,792)	(87%)	Under Budget		\$216,000	\$125,070	\$40,433	(\$175,567)	(81%)	Under Budget
<b>Total Program</b>	<b>\$1,175,501</b>	<b>\$821,051</b>	<b>\$462,948</b>	<b>(\$712,553)</b>	<b>(61%)</b>	<b>Under Budget</b>		<b>\$2,031,298</b>	<b>\$1,248,098</b>	<b>\$853,865</b>	<b>(\$1,177,433)</b>	<b>(58%)</b>	<b>Under Budget</b>

### Monthly Actuals - by Workstream



### Notes:

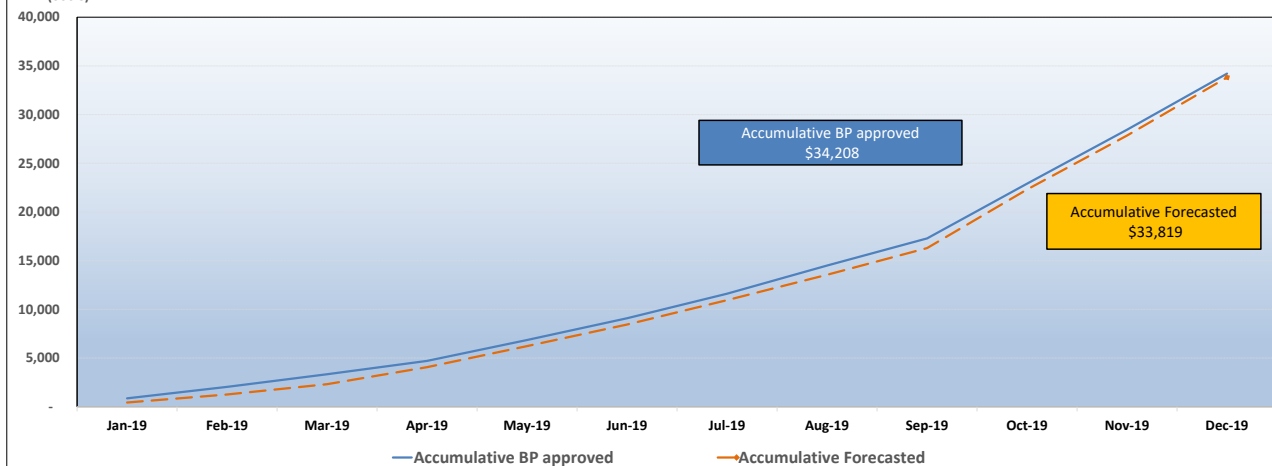
Analysis of YTD variance indicates: 1) The delayed onboarding of the Detailed Design consultant at a rate of \$240K per month. Contracts have now been signed and the consultants should be on board by mid March. 2) Some planned resources for Detailed Design have not yet been onboarded. 3) Some resources are being used to close out the High Level Designed phase.

### Monthly Comparison - 2019 Capital Actuals

Project	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD
Energy	364,692	448,740											813,432
Capacity	26,225	14,208											40,433
<b>Total</b>	<b>390,917</b>	<b>462,948</b>	-	-	-	-	-	-	-	-	-	-	<b>853,865</b>

Accumulative Total  
(000's)

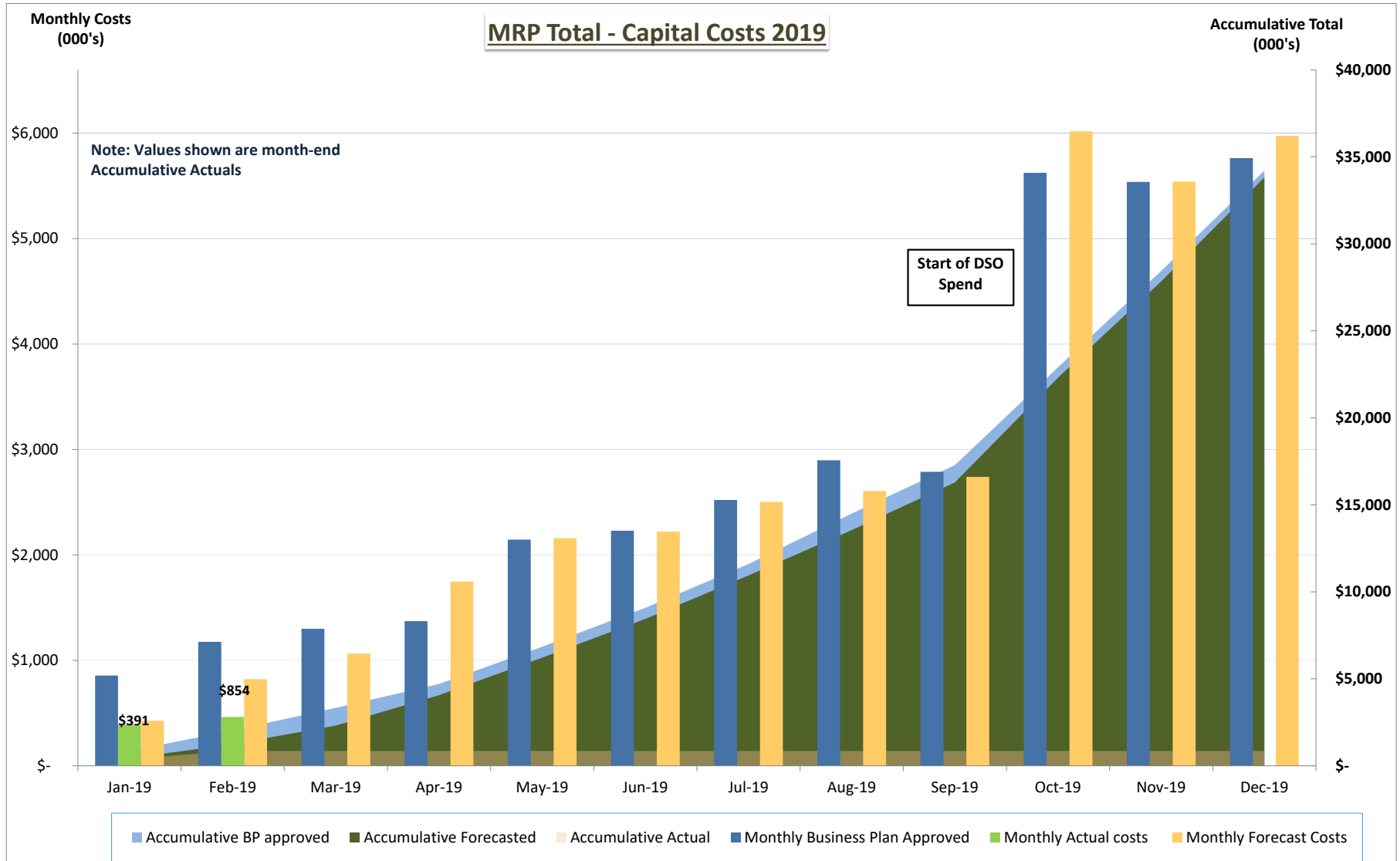
### Budget vs Forecast Variance - Capital



### Budget vs Forecast Tracker

Energy													
Category	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	More employees charging to Capital than anticipated (Jan - Dec)	\$620											
Detailed Design Consultants	Reflect procurement delays in onboarding consultant - Jan & Feb	(\$480)											
Rent	50% Reallocation from Opex	\$348											
Interest	Interest included		\$74										
January Actuals			(\$170)										
<b>Net Change Energy</b>		<b>\$488</b>	<b>(\$96)</b>										
Capacity													
Category	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Remove ICA labour from forecast for Q1	(\$792)											
Rent	Added for May - Dec	\$232											
Rental Facility	No Stakeholdering Events	(\$18)											
Software	Removed ICA Auction Engine forecast - Jan & Feb	(\$240)											
Interest	Interest included		\$36										
January Actuals			\$1										
<b>Net Change Capacity</b>		<b>(\$818)</b>	<b>\$37</b>										
<b>Combined Revision</b>		<b>(\$330)</b>	<b>(\$59)</b>										





Notes: This graph shows the Monthly and Accumulated Capital costs for the program throughout 2019.

## MRP - Operating Financial Summary - 28-Feb-19

The operating expenses approved under the 2019 Business Plan captures the non-capital costs incurred during the Detailed Design phase of the program throughout 2019.

### Variance Summary:

For 2019 Actual costs are being tracked against the Approved Business Plan.

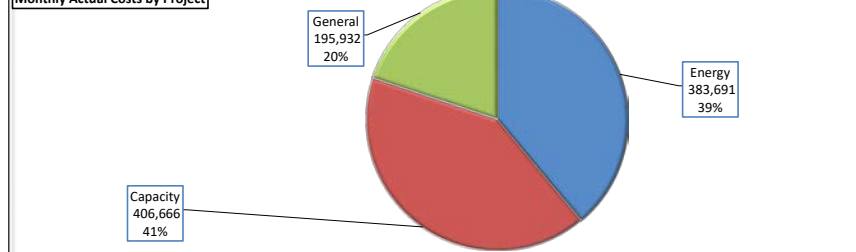
Note: For 2019 a Forecast Tracker has been added to the report to track and report variances between the approved Budget and the cost forecast.

### Overview of MRP Monthly Costs:

28-Feb-19

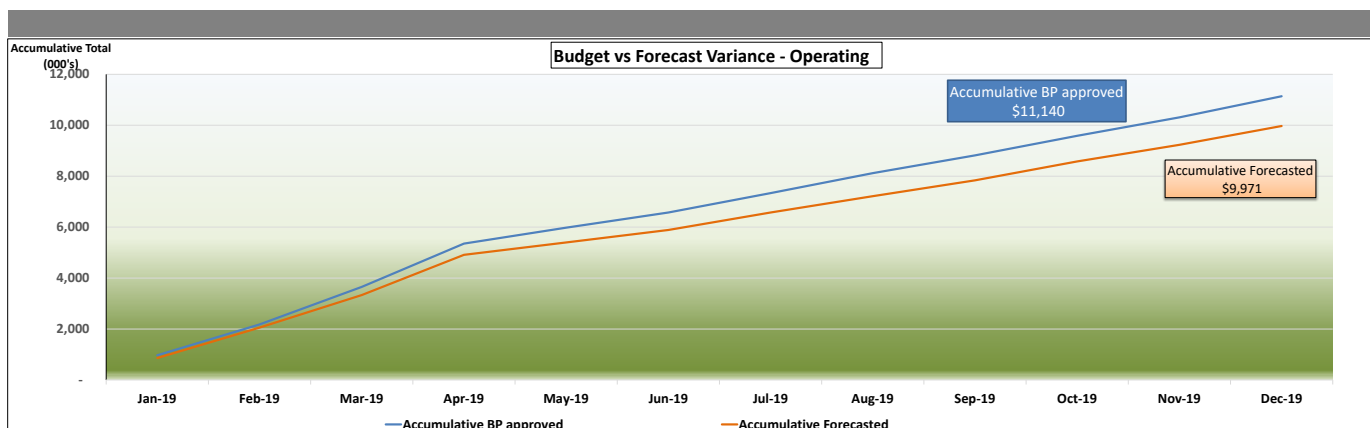
MRP Operating Costs													
Monthly								Year to Date					
Project Name	Business Plan Approved Costs	2019 Forecast	Actual	Variance Actual vs Budget	Variance %	Status for 28-Feb-19	Comments	YTD Business Plan Approved	YTD 2019 Forecast	YTD Actual	YTD Actual vs Budget	Variance %	YTD Status
Energy	\$95,349	\$238,099	\$383,691	\$288,342	302%	Over Budget	The budget had the Markets team charging to Energy later in the year.	\$163,805	\$430,478	\$576,070	\$412,265	252%	Over Budget
Capacity	\$796,577	\$725,577	\$406,666	(\$389,911)	(49%)	Under Budget		\$1,414,694	\$1,130,320	\$811,409	(\$603,285)	(43%)	Under Budget
General	\$318,712	\$230,712	\$195,932	(\$122,780)	(39%)	Under Budget		\$601,920	\$494,563	\$459,783	(\$142,137)	(24%)	Under Budget
Total Program	\$1,210,638	\$1,194,388	\$986,289	(\$224,349)	(19%)	Under Budget		\$2,180,419	\$2,055,361	\$1,847,262	(\$333,157)	(15%)	Under Budget

### Monthly Actual Costs by Project

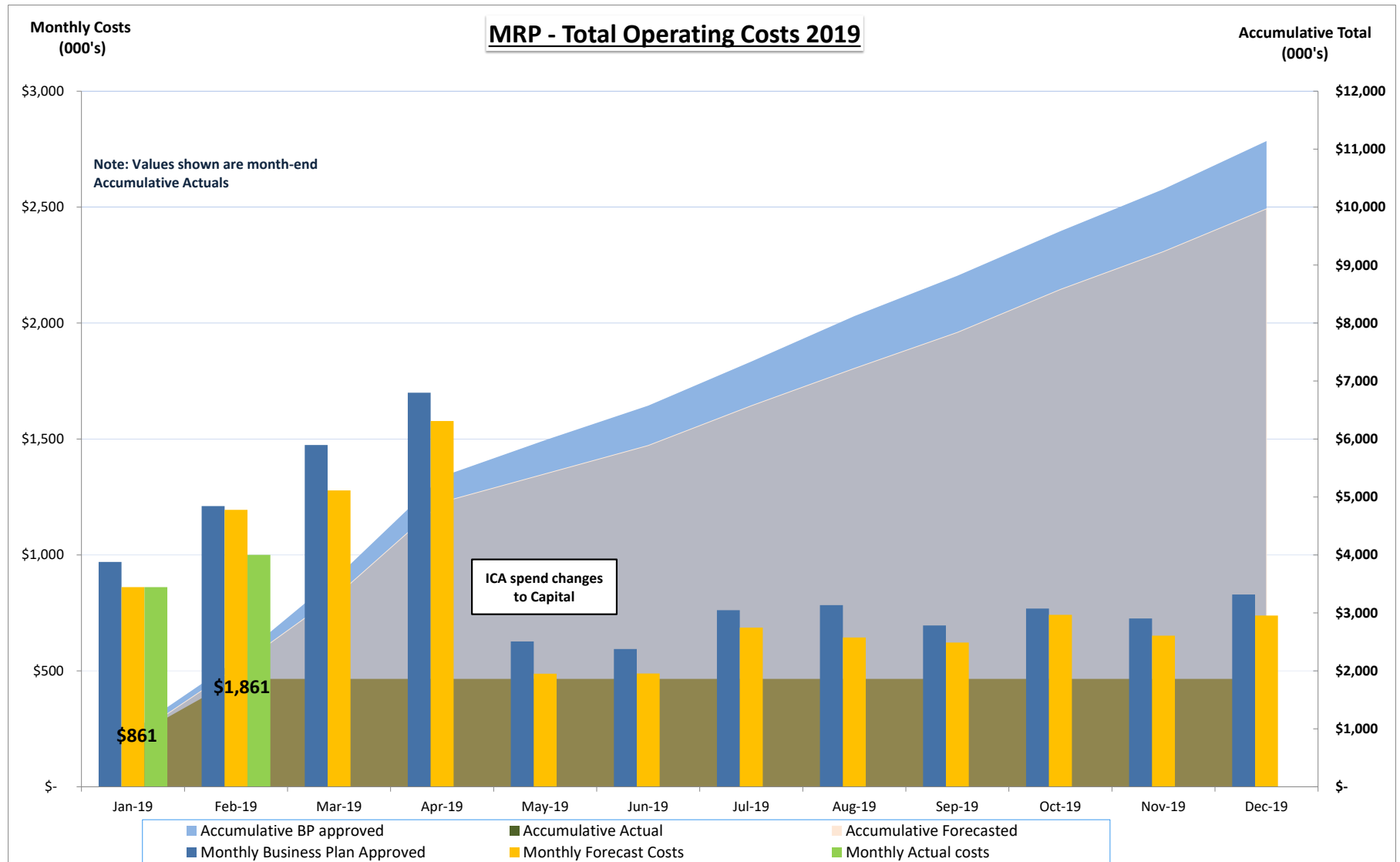


Notes: Energy has a higher operating costs than budgeted as the labour costs increased to reflect the increased effort from the Markets team. Capacity's variance continues to reflect the delay in onboarding of resources.

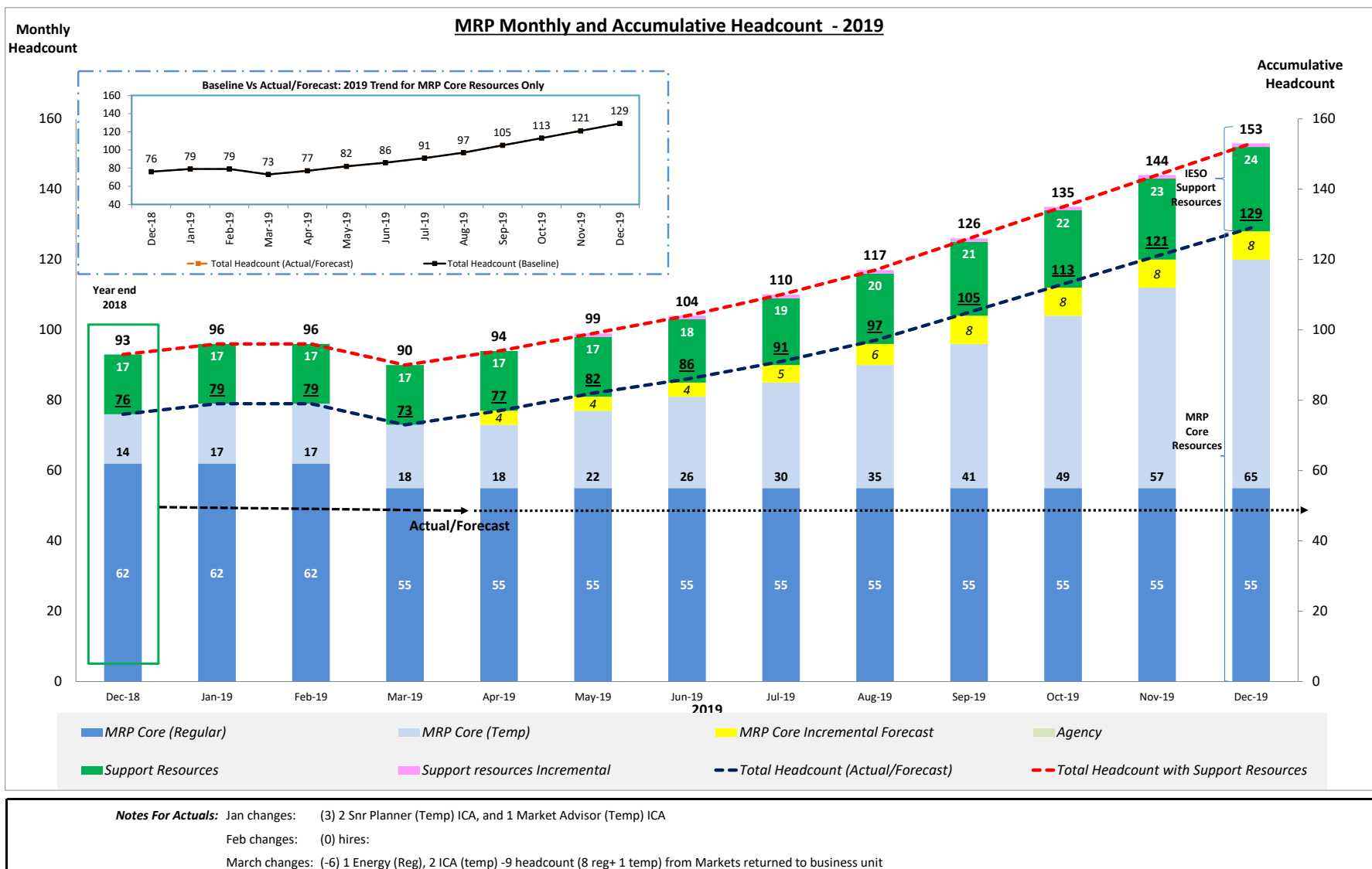
MRP Monthly Comparison - 2019 Operating Actuals													
Project	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD
Energy	192,379	383,691											576,070
ICA	404,743	406,666											811,409
General	263,851	195,932											459,783
<b>Total</b>	<b>860,973</b>	<b>986,289</b>	-	-	-	-	-	-	-	-	-	-	<b>1,847,262</b>

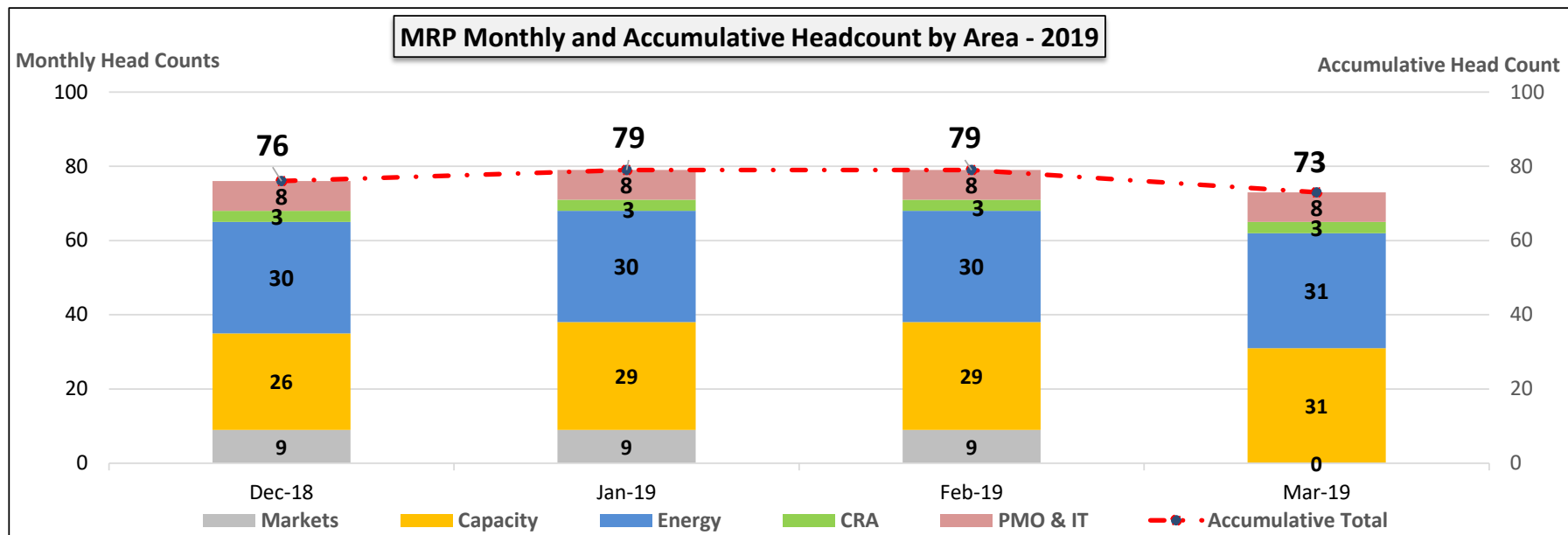


Budget vs Forecast Tracker													
Energy													
	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Revised labour based on current projections	(\$79)											
Consultants	Added to forecast for continued High Level Design work	\$148											
January Actuals			\$31										
<b>Net Change Energy</b>		<b>\$69</b>	<b>\$31</b>										
Capacity													
	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Revised labour based on current projections	(\$683)											
Rent	Reallocated from General (Jan - Apr)	\$116											
January Actuals			(\$51)										
<b>Net Change Capacity</b>		<b>(\$567)</b>	<b>(\$51)</b>										
	Rationale	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IESO Labour	Included Society Allowance	\$84											
Rent	Reallocated to workstreams	(\$696)											
January Actuals			(\$39)										
<b>Net Change Capacity</b>		<b>(\$612)</b>	<b>(\$39)</b>										
<b>Combined Revision</b>		<b>(\$1,110)</b>	<b>(\$59)</b>										

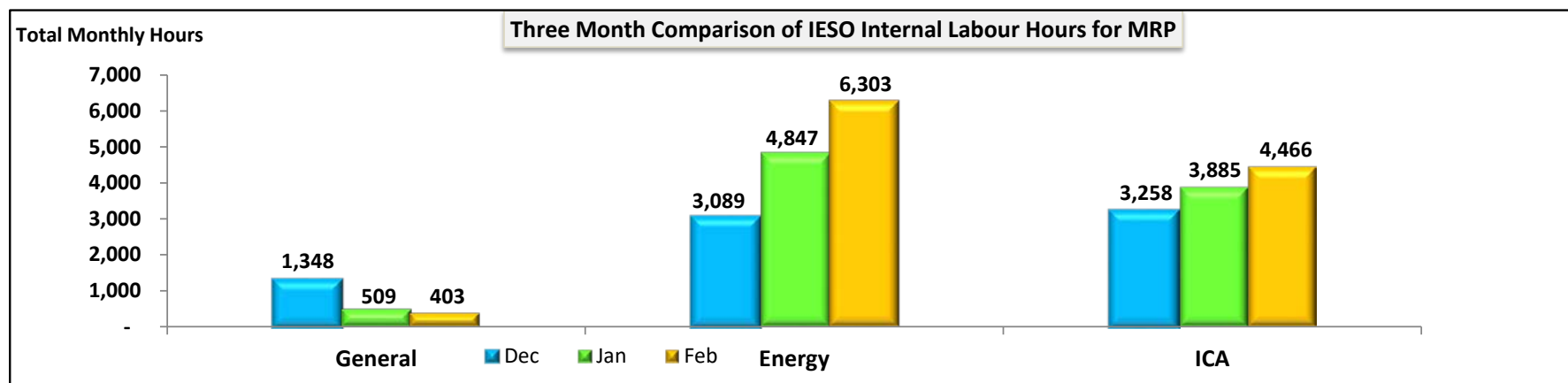


Notes: This graph shows the monthly and accumulated Operating costs for the program throughout 2019.





Incremental Resources Notes: Jan'19 (3) 2 Snr Planner (Temp) ICA, and 1 Market Advisor (Temp) ICA  
 Feb'19 (0) hires:  
 Mar'19 (-6) 1 Energy (Reg), 2 ICA (temp) -9 headcount (8 reg+ 1 temp) from Markets returned to business unit



Notes: The spike in Energy is the result of the Markets team charging additional hours in preparation of the 2019 Business Case.

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Program: MRP-Market Renewal Program

Project: Total MRP Program

Monthly Schedule Report for MRESC  
February 22, 2019

Document Ref. No.: MRP\_MSR02\_19-02-22  
(MSR ~ 02)

Project Commencement Reporting Date: Jan 1, 2018  
Project Completion Reporting Date: Dec 31, 2018

Reporting Range Period	From <i>January 1, 2018</i>	<<<<<	>>>>>	To <i>February 22, 2019</i>
For Week ending	<i>February 22, 2019</i>			
Reporting Date	<i>March 8, 2019</i>			

Program Schedule Status

Schedule Baseline	Accumulative Planned % (Baseline)	Accumulative Actual %	Variance %	Schedule Variance <sup>(1)</sup>
	13.5%	10.6%	(-2.9%)	Under Threshold
Schedule Forecast	Accumulative Planned % (Forecast)	Accumulative Actual %	Variance %	Schedule Variance <sup>(1)</sup>
	13.2%	10.6%	(-2.5%)	Under Threshold

Month End Project Performance Status

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	\$5,524,716	\$4,338,578	0.79	Behind Schedule
Cost Performance (Energy & Capacity)	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	\$2,241,322	\$4,338,578	1.94	Under Budget
MRP Total Actual Cost	\$2,701,105			

**Legend for Status:**

(1)Schedule Variance: Defined as "Under Threshold" if Variance % (delta between Actual Progress Percentage Vs Baseline Planned Percentage) < -10%, "Alarming" if Variance % (delta between Actual Progress Percentage Vs Baseline Planned Percentage) is >= -10%, then the Baseline Schedule should be Re-baseline via program change control process.

(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule"or if SPI=1 "On Schedule"

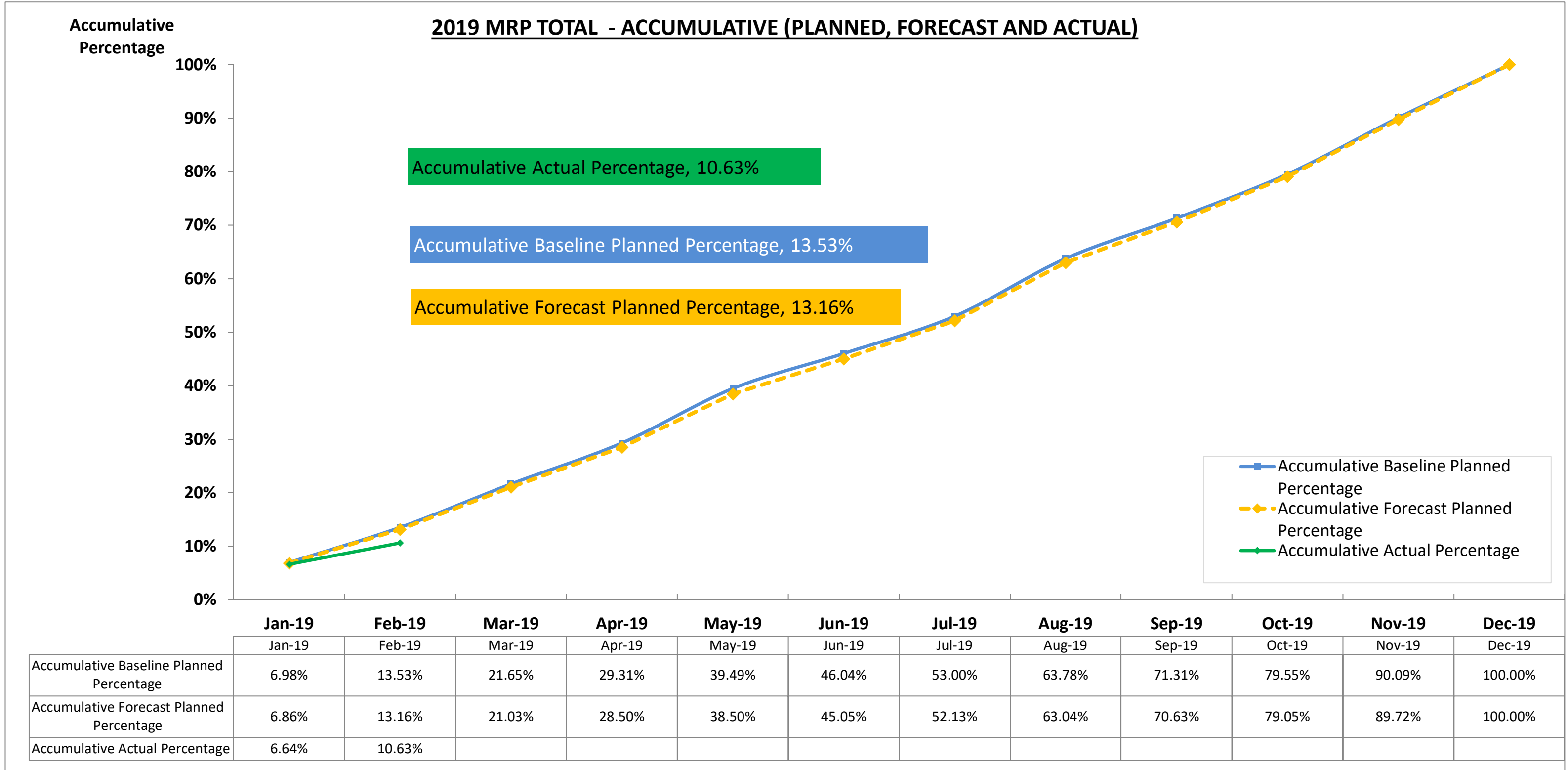
(3).Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"

Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.



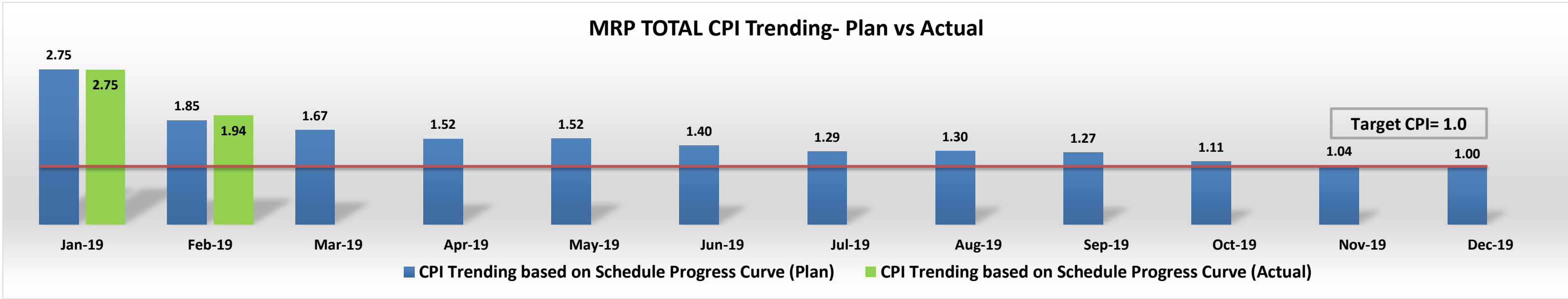
Monthly Status as of: 22-Feb-19

PROGRESS INDICATORS										PERFORMANCE INDICATORS			
MRP	2019 Total Budget at Completion (BAC) <sup>(1)</sup>	2019 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed	Variance <sup>(2)</sup> (-/+)	Earned Value (EV)  (BAC X Monthly Scheduled Actual Progress)	Planned Value (PV)  (BAC X Monthly Scheduled Planned %)	CPI (EV/AC)	SPI (EV/PV)
Energy	\$25,294,875	\$1,389,502	61.96%	01-Jan-18	31-Dec-18	13.27%	9.25%	5.73%	(-4.0%)	\$2,339,776	\$3,356,630	1.68	0.7
Capacity	\$15,530,704	\$851,820	38.04%	01-Jan-18	31-Dec-18	13.96%	12.87%	4.90%	(-1.1%)	\$1,998,802	\$2,168,086	2.35	0.92
Energy & Capacity Sub Total	\$40,825,579	\$2,241,322	100.00%			13.53%		10.63%	(-2.9%)	\$4,338,578	\$5,524,716	1.94	0.79
General	\$4,522,164	\$459,783											
Total	\$45,347,743	\$2,701,105											



Notes:- (1) 2019 Budget at Completion(BAC) values are used for computing the SPI and CPI

(2) Overall Baseline Schedule Variance for MRP -2.9%







Monthly Performance Status

22-Feb-19

MRP Total	Performance Index Value
SPI	0.79

Schedule Performance Index

Threshold limits

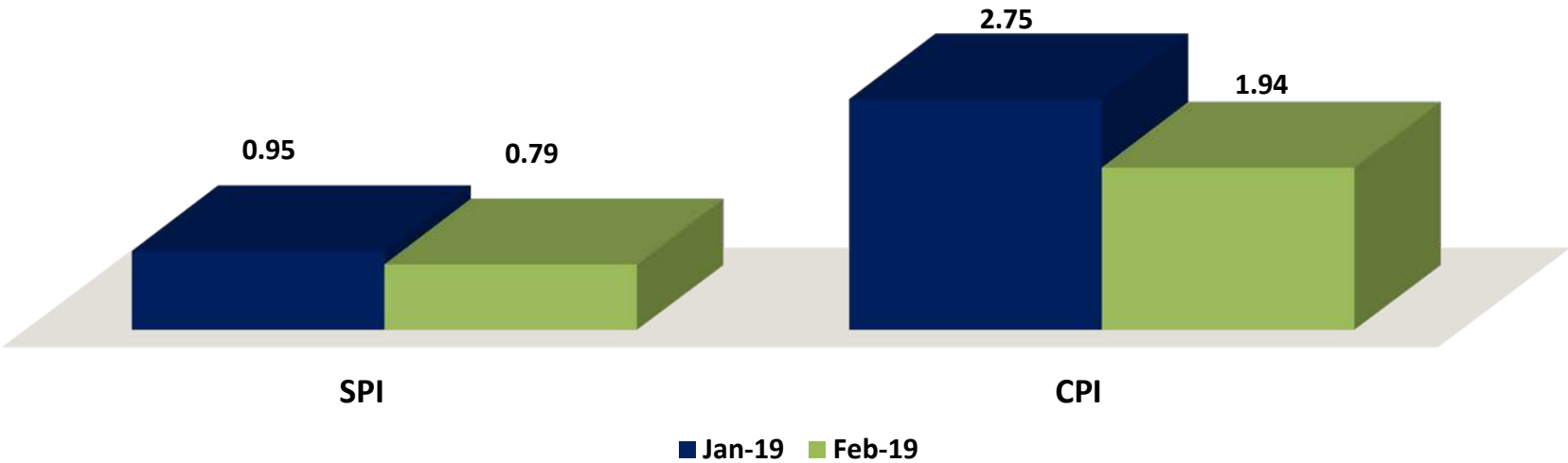
Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9

MRP Total	Performance Index Value
CPI	1.94

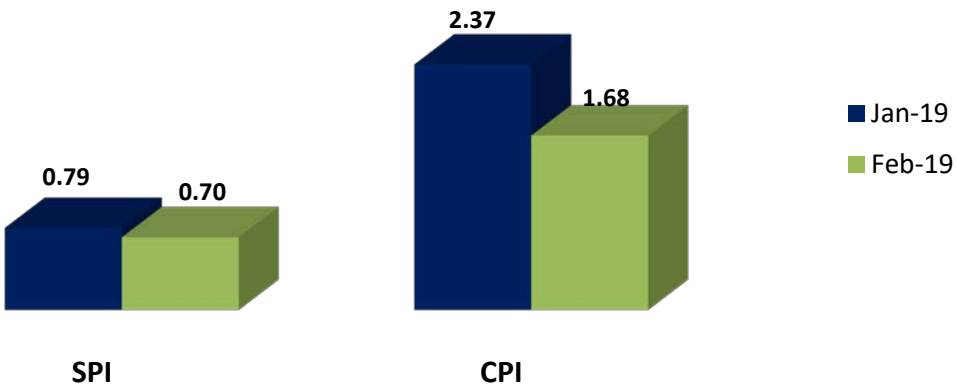
Cost Performance Index

Two Month Rolling Performance Comparison

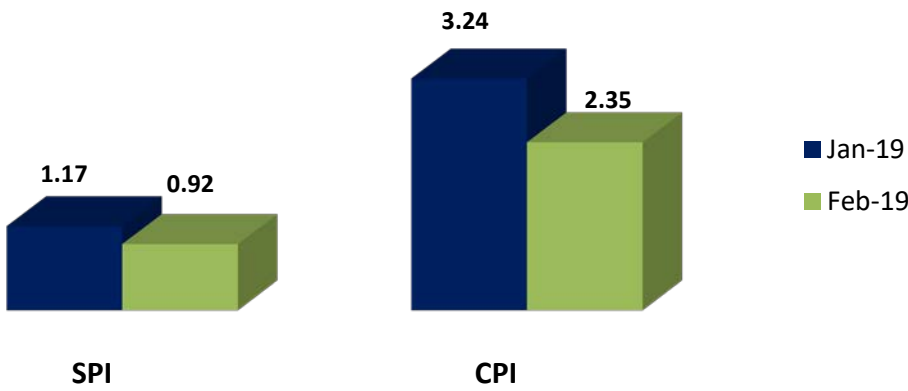
MRP-TOTAL



Energy



Capacity



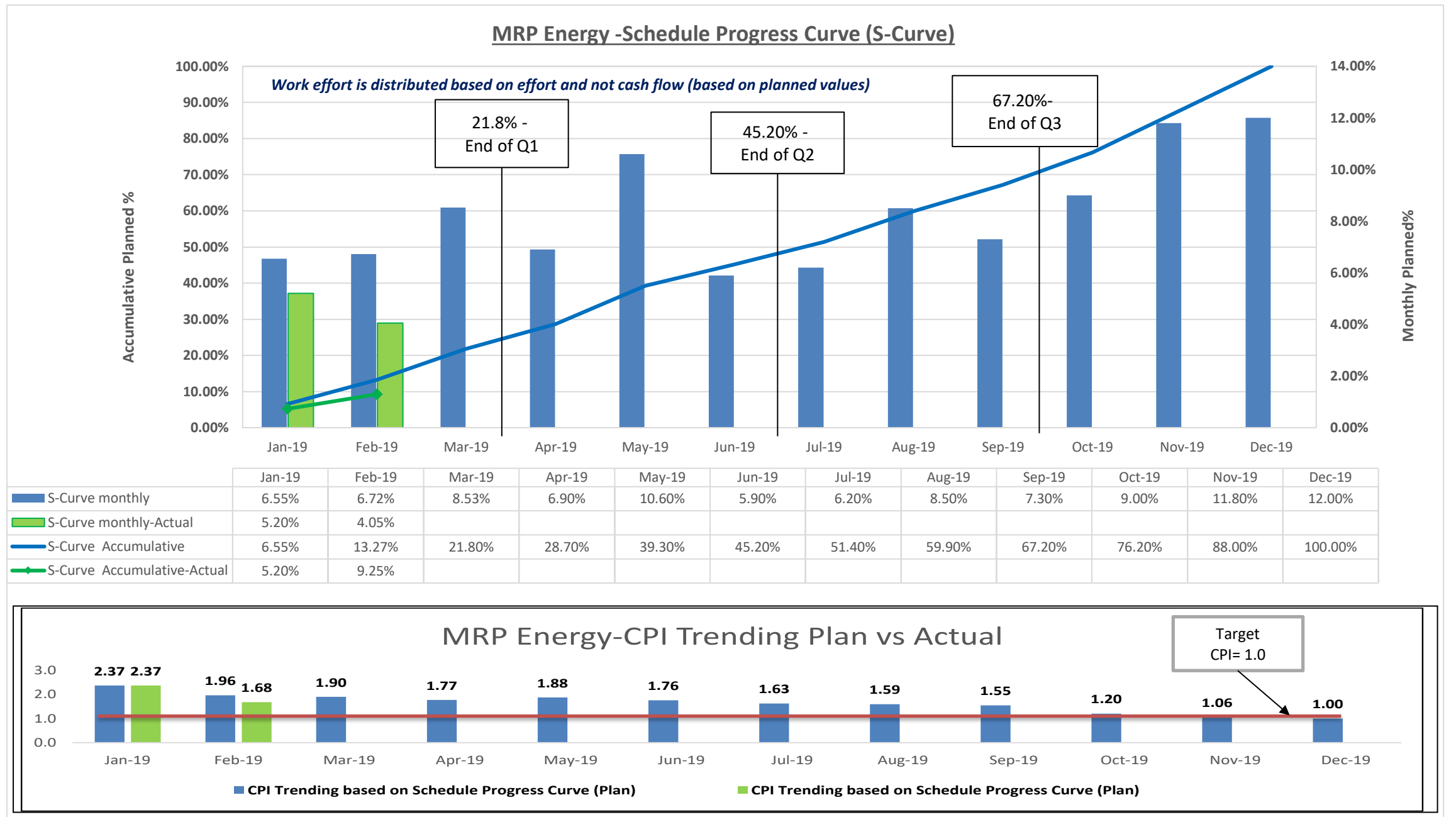
**PMI Definitions:**

**CPI (Cost Performance Index)**  
The cost performance index (**CPI**) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

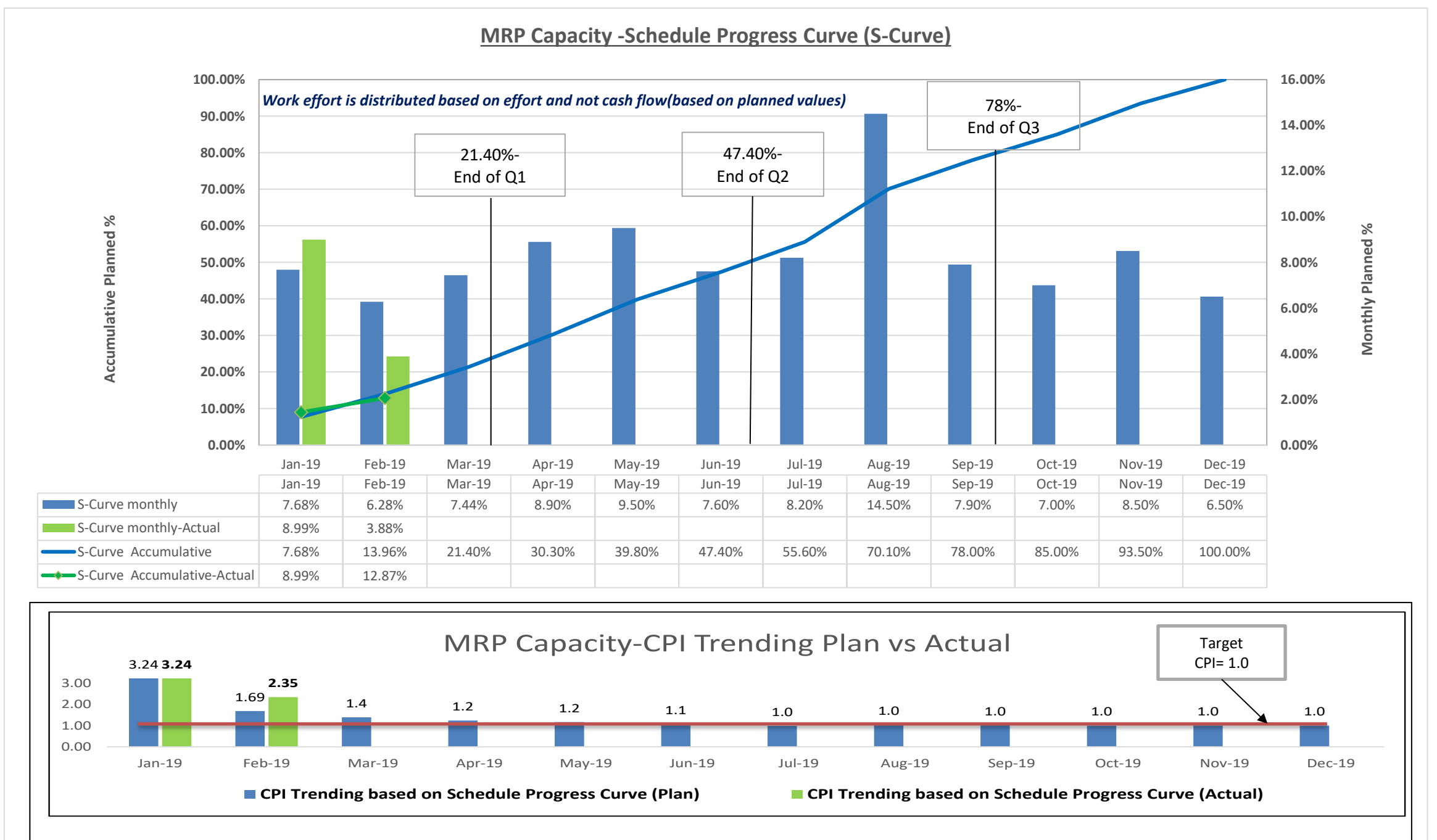
**SPI (Schedule Performance Index)**  
Schedule performance index (**SPI**) is a ratio of the earned value (EV) to the planned value (PV).  $SPI = EV \div PV$ . If the **SPI** is less than one, it indicates that the **project** is potentially behind schedule to-date whereas an **SPI** greater than one, indicates the **project** is running ahead of schedule



## MRP Energy Progress Curves (Planned Vs Actual)



## MRP Capacity Progress Curves (Planned Vs Actual)



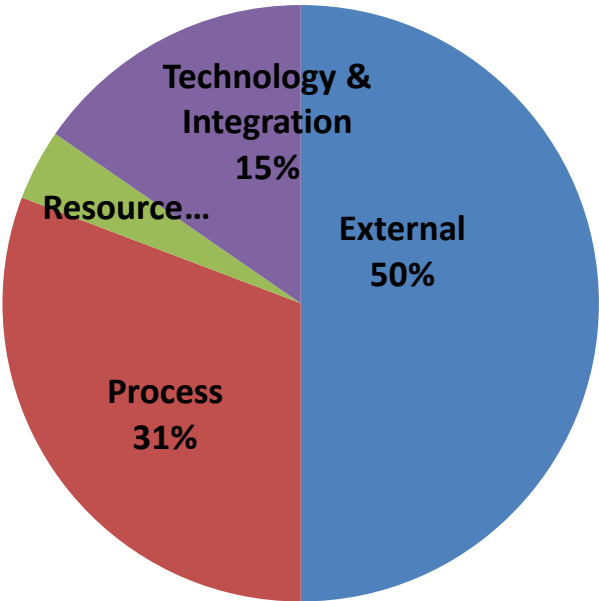
Program: MRP-Market Renewal Program

Monthly Risk Report For MRESC  
February 28, 2019

Document Ref. No.: PRG\_MRR09

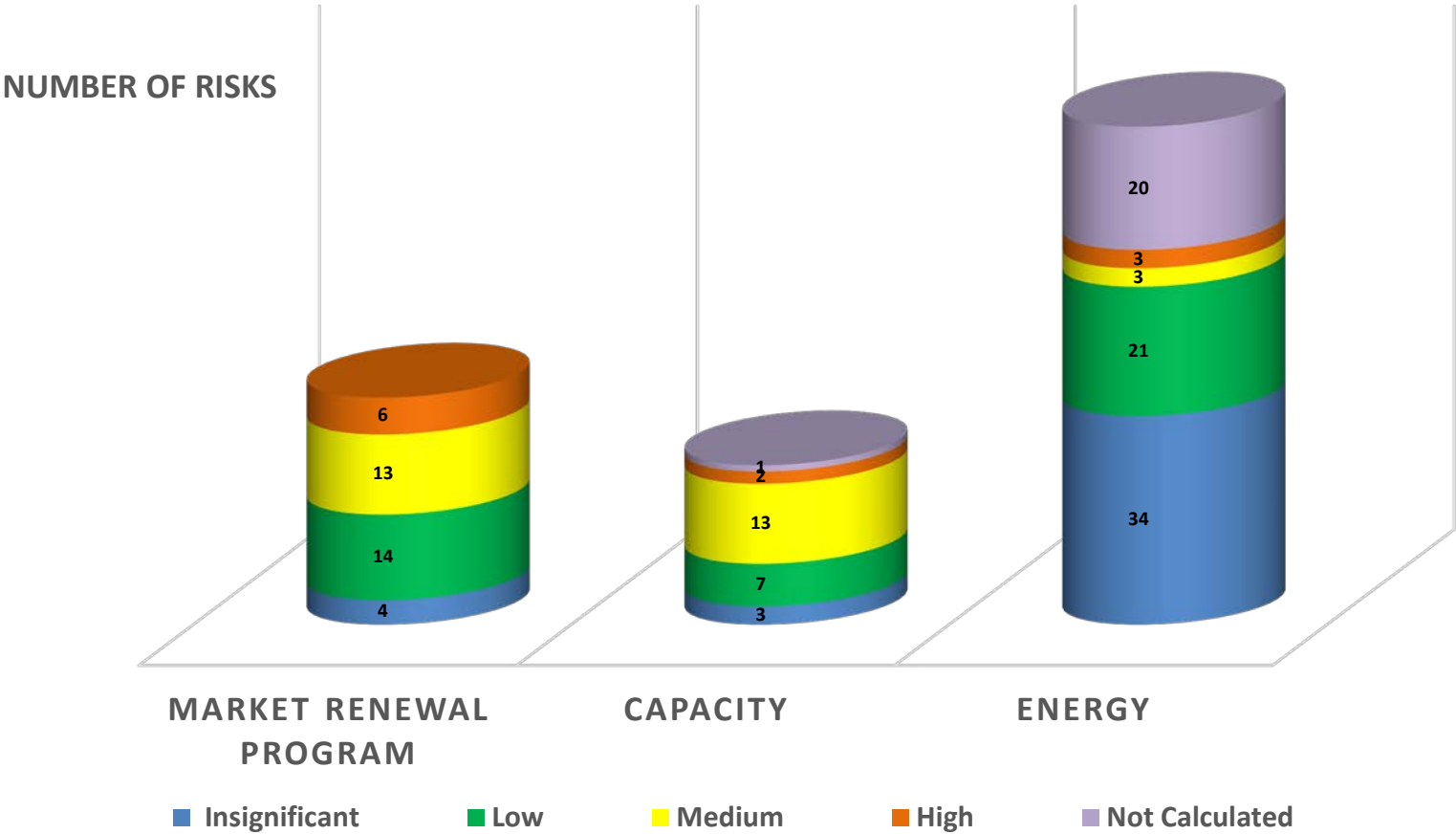
Period: Month Ending: 28-Feb-19

MRP - Total Residual Risk By Category



All program and project risks have been categorised into four categories, with the largest category of risks being categories as "External" risks.

MRP - TOTAL RESIDUAL RISK BY WORKSTEAM



All MRP Risks have been divided into the two workstreams Energy, ICA, and MRP Program risks. Each identified risk was assessed with the project team, and the document the risk response tasks that will be implemented proactively to prevent or at least reduce the level of the identified risk. In total we currently have 144 Risks



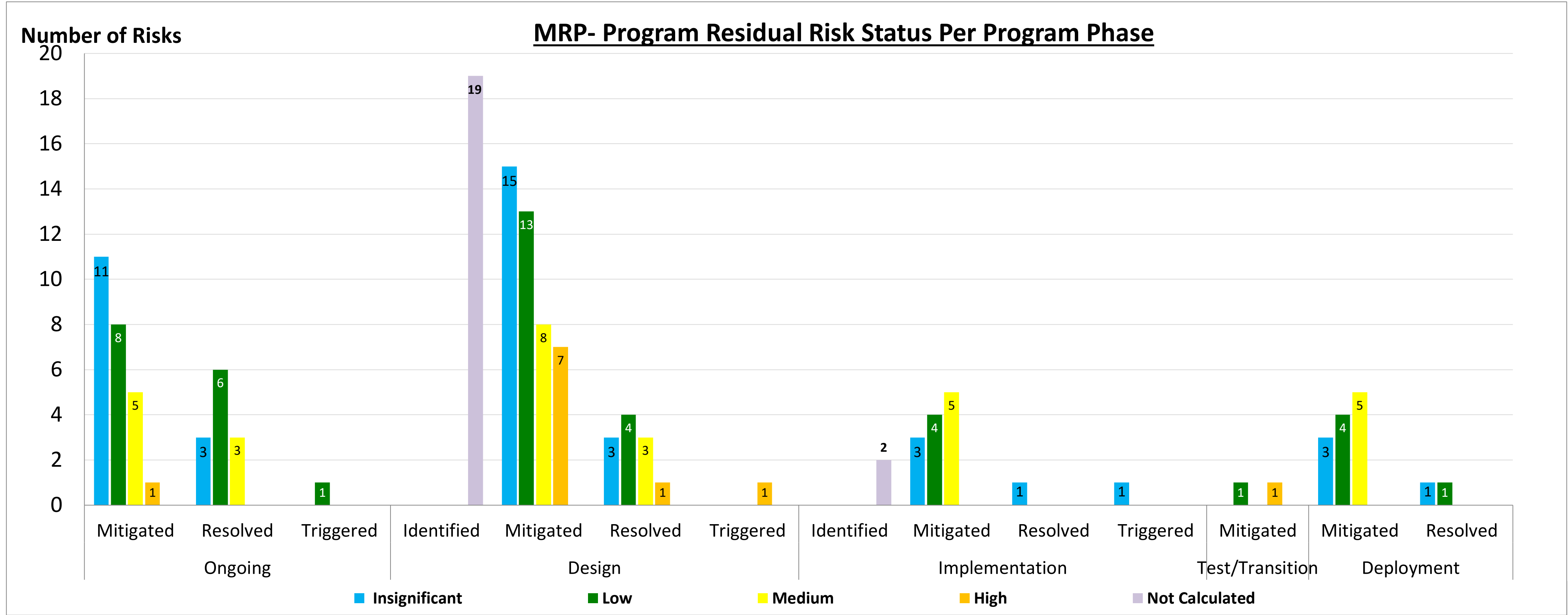
MRP RISK SUMMARY - MRESC as of Feb 28,2019

TOP MRP CONTROLABLE RISKS - OPEN

Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R027	Market Renewal Program	Design	External	OEB indicates they are not properly informed about the new market design.	High	Regulatory Affairs is leading all engagement with OEB and keeping Market Strategy group informed of meeting dates/materials. Targeted outreach (ad-hoc CEO updates, quarterly executive team updates, monthly staff updates etc.)	Mitigated	<div></div>
MRP_R037	Market Renewal Program	Design	External	New Government adversely impacting MRP scope or schedule	High	Frequent communication with government to ensure alignment as much as possible.	Mitigated	<div></div>
ICA_R024	Capacity - ICA	Design	Process	Lack of clarity regarding division of accountability between ICA Team and line of business	High	Engage internal stakeholders regarding roles and responsibilities of line staff vs. the ICA Team	Mitigated	<div></div>
DAM_R012	Energy - DAM	Design	Process	Contracted or rate-regulated participants may be resistive to DAM participation rules and two-settlement outcomes	High	Develop a strategic engagements plan with the SE team	Mitigated	<div></div>
DAM_R007	Energy - DAM	Design	Process	Contract negotiations fail to incent sufficient participation to achieve material price convergence between DAM & Real Time	High	Ensure full participants engaging/soliciting on design features to ensure design will incentivize (price certainty, overall lower cost, etc...)	Mitigated	<div></div>
MRP_R005	Market Renewal Program	Ongoing	Process	Difficulty reaching agreement with internal stakeholders (Change Management).	High	Operations and IT Leads assigned to reduce the impact as they are representing their respective areas. Director's Forum is setup to facilitate these escalations. Final step for resolution is the MRESC	Mitigated	<div></div>
MRP_R003	Market Renewal Program	Ongoing	Process	Critical interdependencies with other projects (e.g. CRS Replacement)	High	MRP Representation on dependent projects and representation on PSC. MRP leads and BA's to work with dependant projects to identify any impacts during design phase.	Mitigated	<div></div>
ICA_R019	Capacity - ICA	Test/Transition	Process	The need for parallel activities on timeline (e.g. market rules with market manuals at technical panel)	High	Start activities as early as possible.	Mitigated	<div></div>
MRP_R015	Market Renewal Program	Implementation	Technology & Integration	Design decisions need to be revisited due to technical limitations	High	IT Lead and resources have been introduced early on the program to reduce the likelihood and impact of this occurring. Furthermore software vendors will be part of the HLD.	Mitigated	<div></div>

TOP MRP CONTROLABLE RISKS - RESOLVED

Risk ID	Work Stream	Program Phase	Category	Description	Residual Risk Level	Response Tasks	Status	Monthly Trend
MRP_R022	Market Renewal Program	Design	Process	Business Case approvals - approval delays could cause release of Capital expenditure for Detail work on Energy and Capacity work streams	High	Finance has proposed capitalisation expenditure rules that are referencing that the preliminary project stage is completed, and Management, with the relevant authority, implicitly or explicitly authorizes and commits to funding a computer software project. Instead of an approved business case.	Resolved	<div></div>



**Updates on KPMG Risk Assessment**

\*MRP Risk observations and recommendations presented to the Audit committee on February 26.

\* Continue to work on preparing management responses, ownership and timelines for Risk report.

\* Working with KPMG on draft key Program risks and responses for MRP Business Case.

\* Drafting of next phase interviews, that include risk assessment for Business Analysis, Project Management and IT&S.

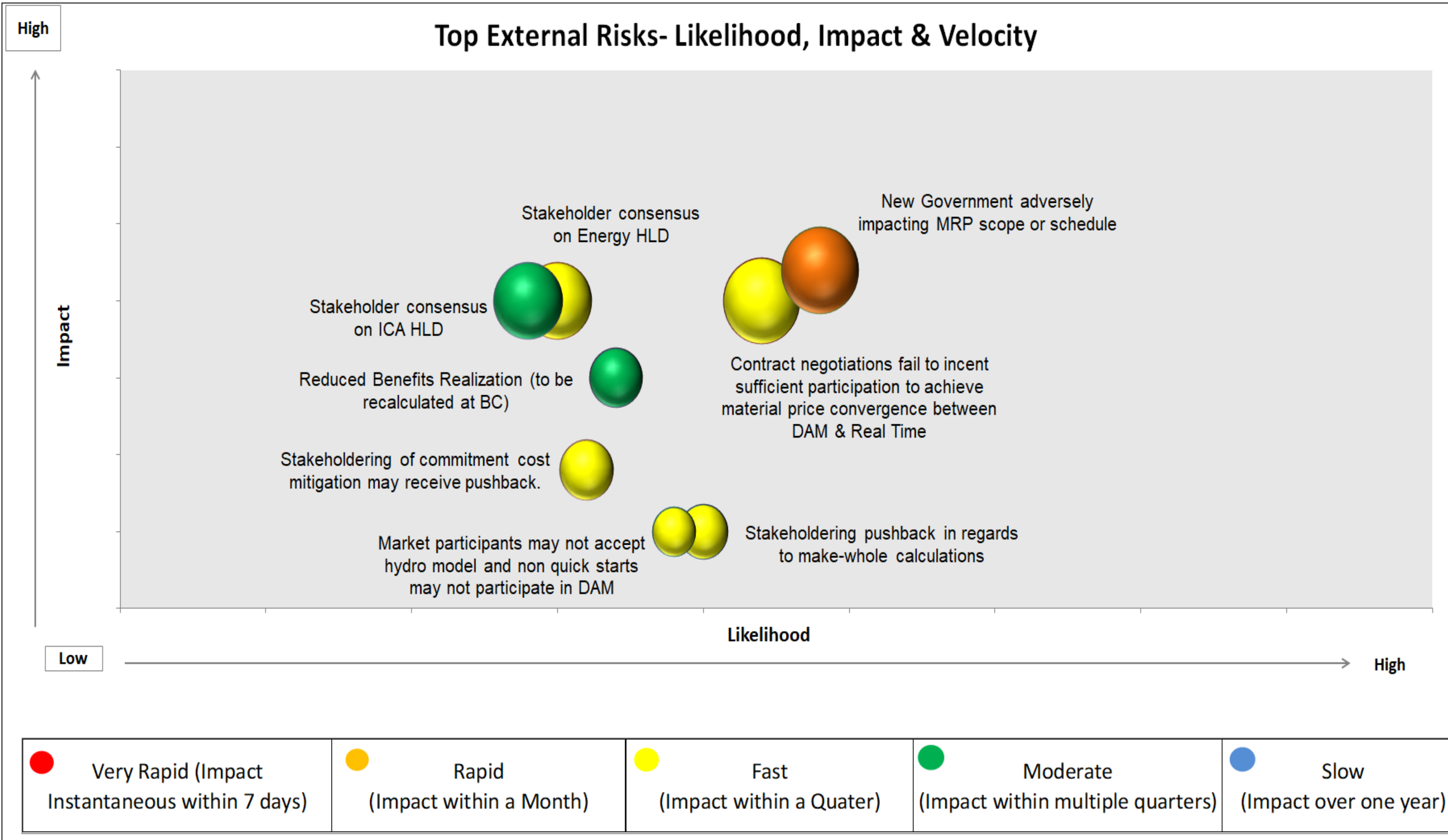




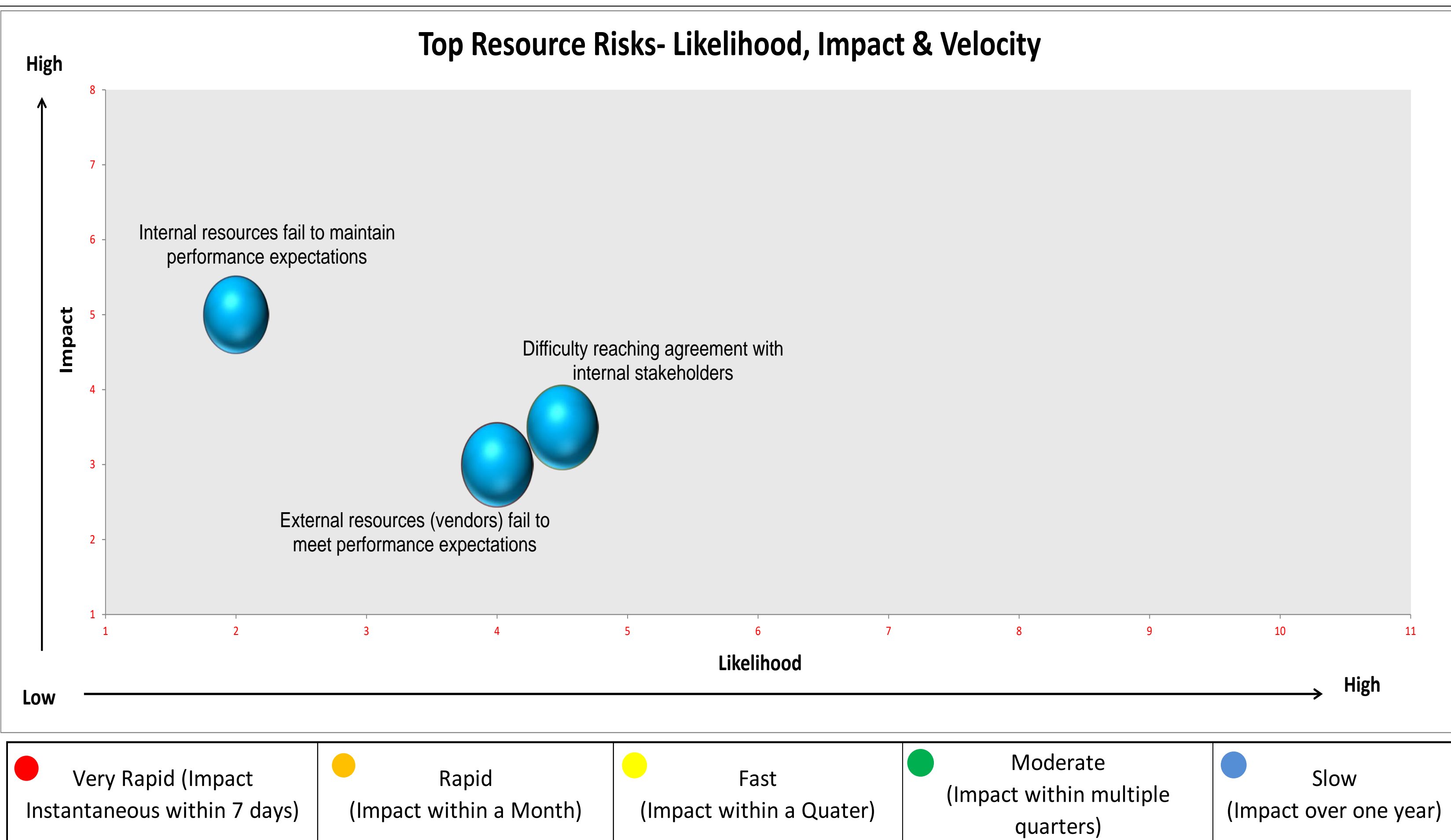
MRP RISK SUMMARY - MRESC as of Feb 28,2019

RISK VELOCITY PER CATEGORY

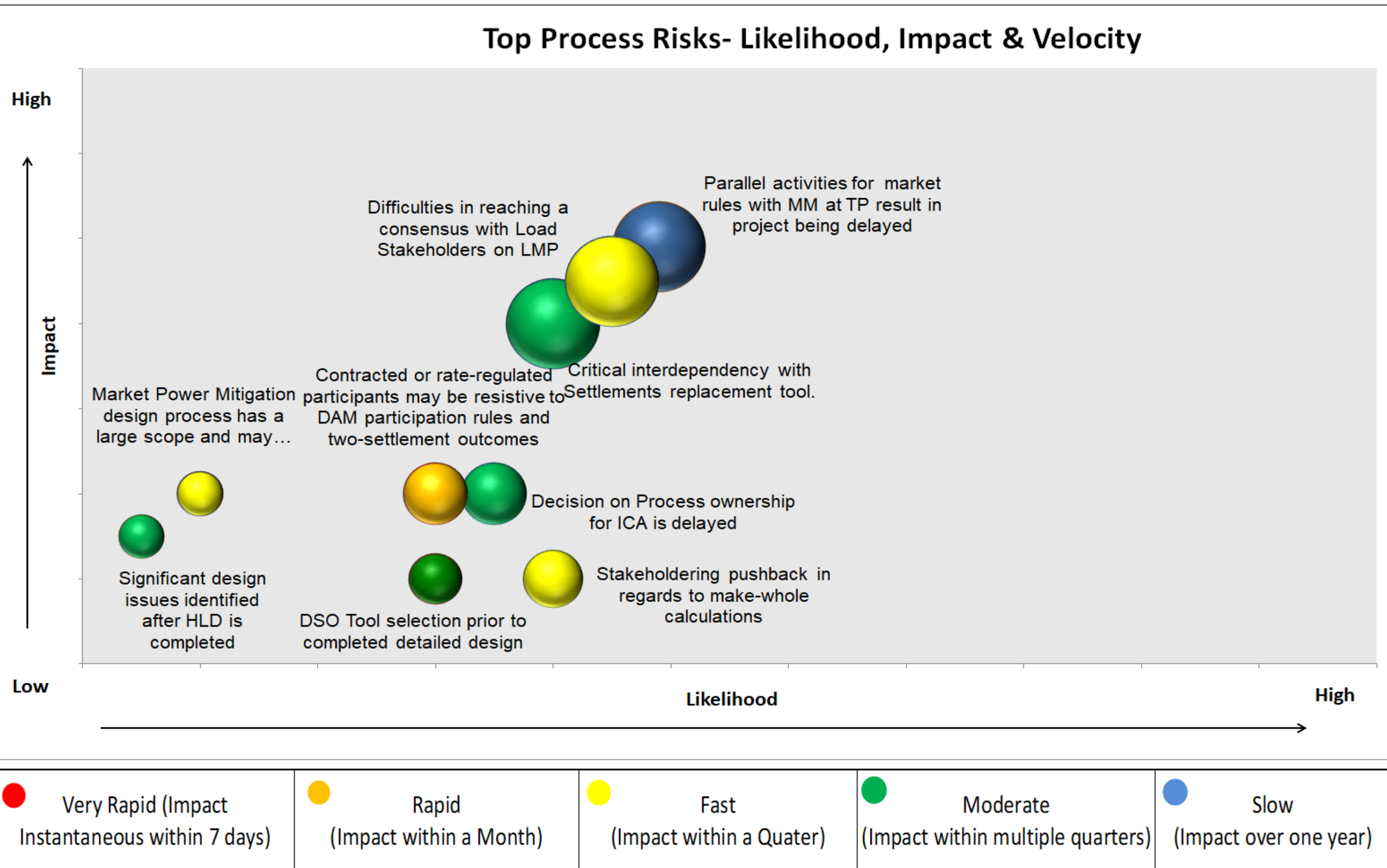
External Risks - Risk Velocity



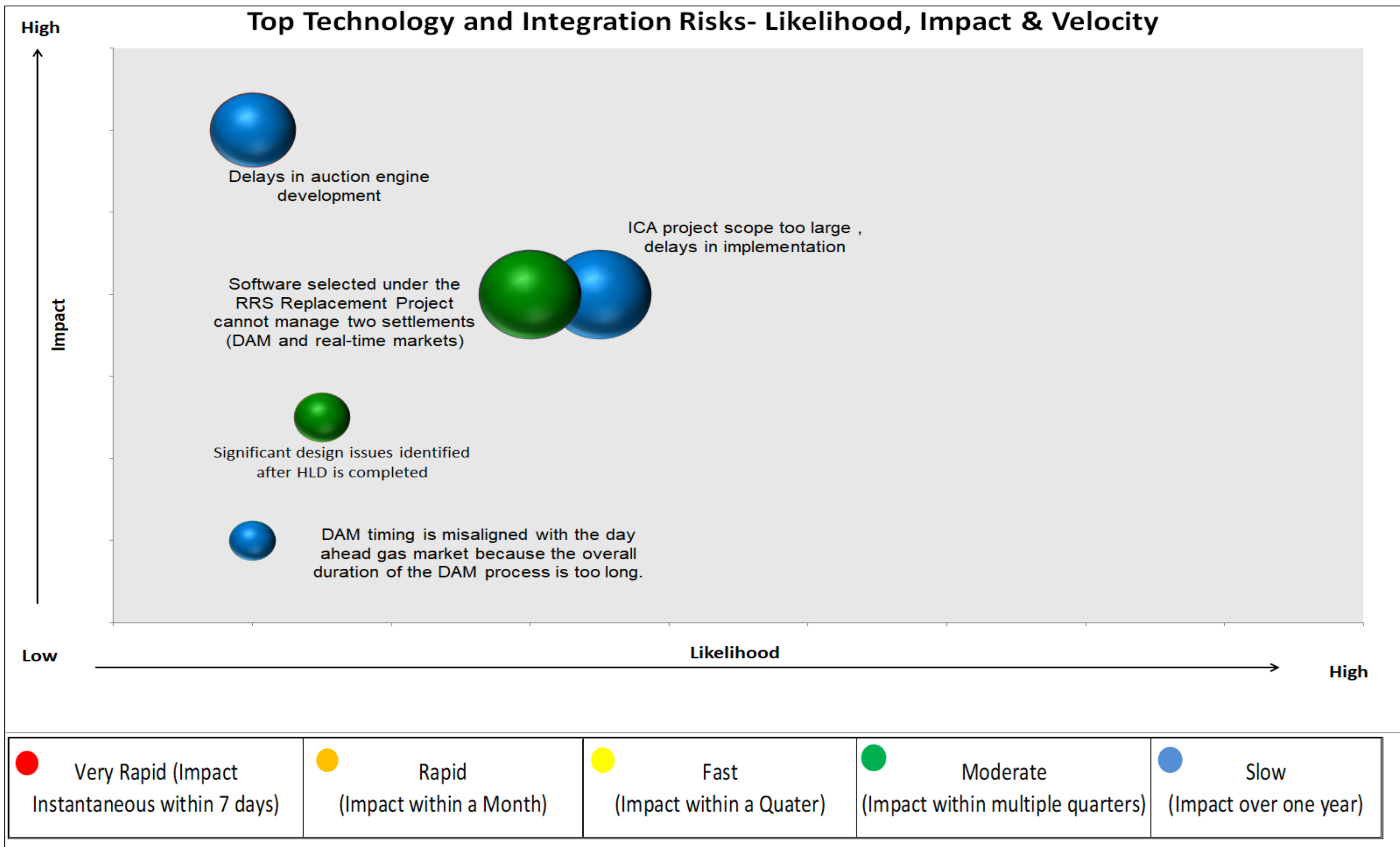
Resource Risks - Risk Velocity



Process Risks - Risk Velocity

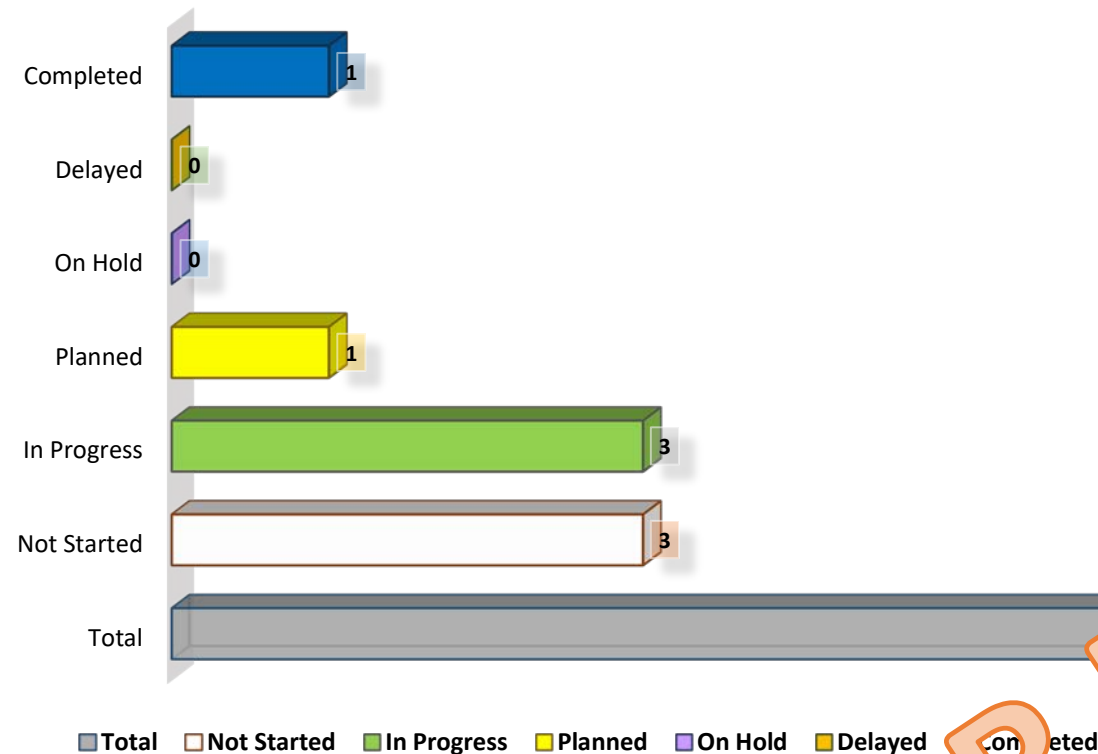


IT & Integration - Risk Velocity

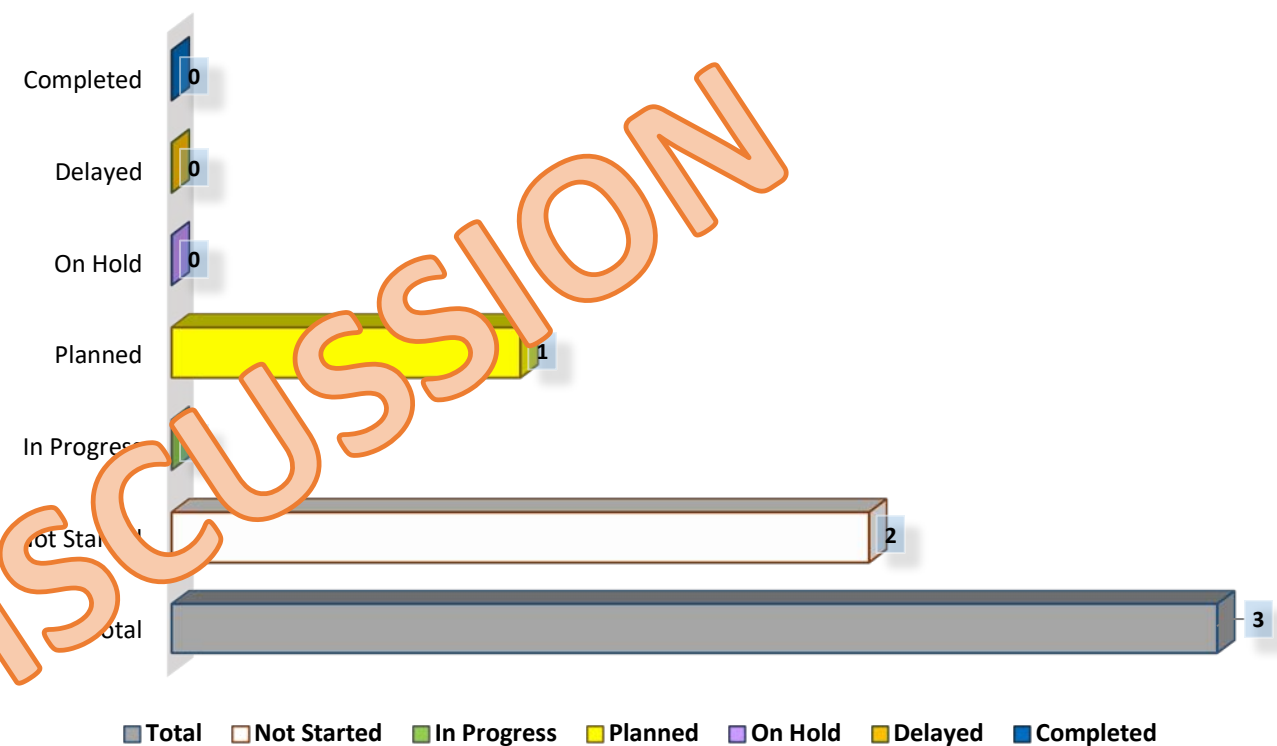


## MRP RISK SUMMARY (KPMG RISK REPORT DASHBOARD)- MRESC as of Feb 28,2019

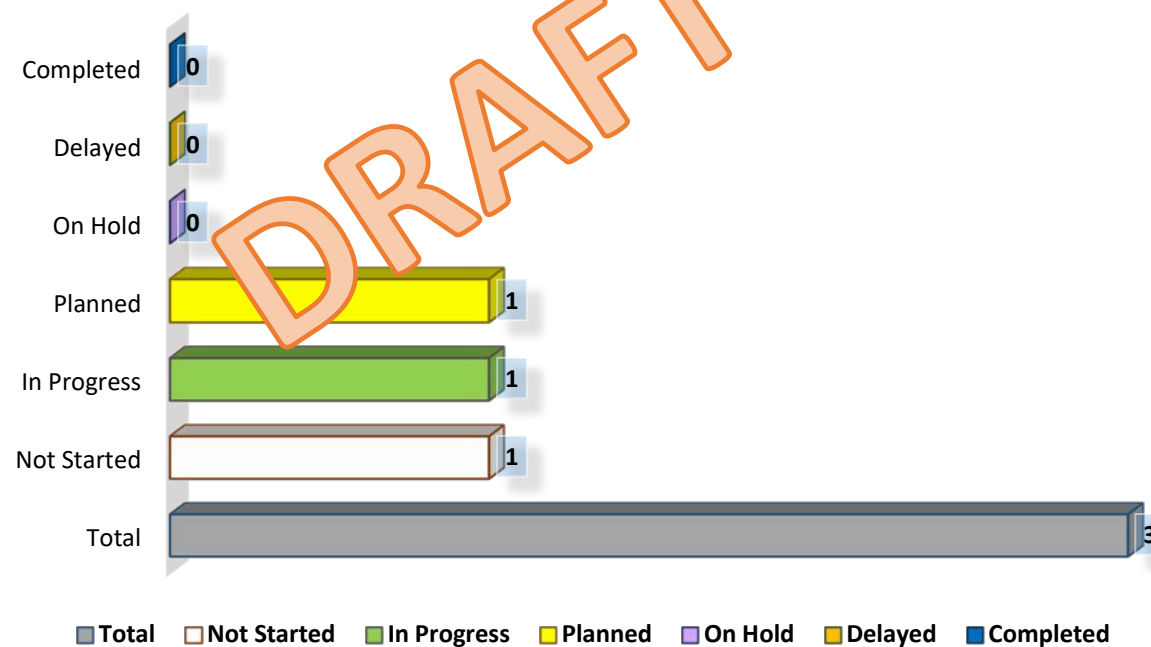
### SYSTEMIC RISK 1: INCONSISTENT BUY-IN TO THE MRP AS BOTH A TRANSFORMATIONAL MARKET AND ORGANIZATIONAL INITIATIVE



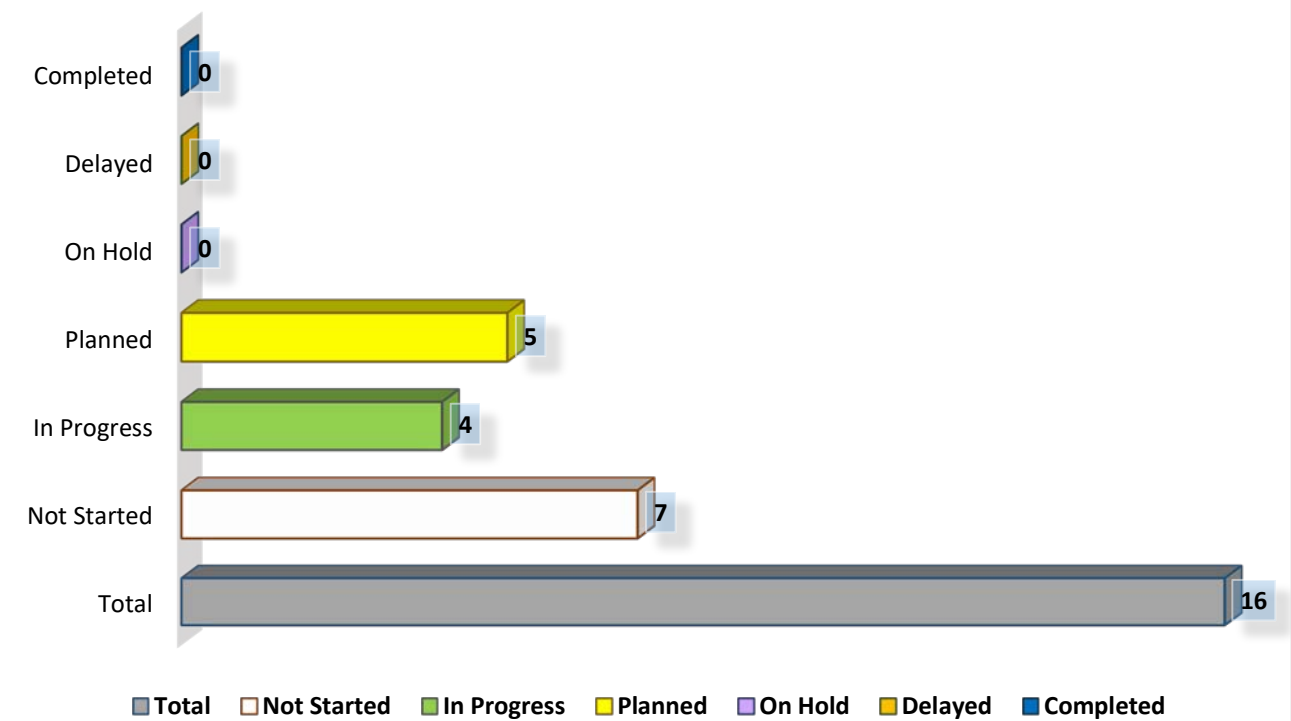
### SYSTEMIC RISK 2: CONSISTENT FRAMEWORK TO SUPPORT STRATEGIC DECISIONS



### SYSTEMIC RISK 3: LACK OF STRATEGIC RESOURCES AND STRATEGY THAT IS ALIGNED WITH THE OVERALL PROGRAM OBJECTIVES, KEY DELIVERABLES, AND MILESTONES.



### KEY RISKS



# MARKET RENEWAL PROGRAM Program Status Summary

## Schedule (SPI)

The program is overall behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.77, compared to 0.79 for the previous month. Within the program, the Energy work stream SPI remains at 0.70 (Yellow); the Capacity work stream SPI is 0.89 (Yellow).

## Cost (CPI)

The program is under budget, with a cumulative Cost Performance Index (CPI) of 1.58 compared to 1.94 for the previous month. The Energy work stream CPI is 1.32 while the Capacity work stream CPI is 2.11.

## Risk

Drafting of next phase risk assessment (Detailed design & Implementation) that include risk interviews for Business Analysis, Project Management and IT&S. All Business Analysis, Project Management interviews have been completed and IT&S interviews to start of week of April 22.

## Upcoming Milestones

The high-level design document for the Incremental Capacity Auction was published for external stakeholder feedback on March 22. Feedback is due on May 17.

Schedule, Cost, Risk, and Milestone data as of March 31, 2019.

Prepared: April 1, 2019

MRESC Meeting: April 17, 2019

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## Program: MRP-Market Renewal Program

Monthly Cost Report for MRESC  
April 15, 2019

Document Ref. No.: PRG\_MCR03

Period: Month Ending  
31-Mar-19

<b><u>Program Cost Summary:</u></b>			
<b>2019 <sup>(1)</sup></b>			
	<b>Operating</b>	<b>Capital</b>	<b>Total</b>
<i>Business Plan (Budget)</i>	11,225	34,437	45,662
<i>Contingency</i>	441	3,563	4,004
<b>Business Plan Approved Costs (incl Contingency)</b>	<b>11,666</b>	<b>38,000</b>	<b>49,666</b>
<i>Forecast</i>			
<i>2019 Forecast</i>	9,258	33,661	42,919
<i>Contingency</i>	441	3,563	4,004
<b>Forecast Incl Contingency</b>	<b>9,699</b>	<b>37,224</b>	<b>46,923</b>
<i>Actual Costs <sup>(2)</sup></i>	2,937	1,883	4,820
<i>Contingency</i>			
<b>Actual with Contingency</b>	<b>2,937</b>	<b>1,883</b>	<b>4,820</b>
<b>% Spent - Program Budget</b>	<b>26%</b>	<b>5%</b>	<b>11%</b>
<b>Life to Date Actuals (2017 to Present)</b>	<b>25,620</b>	<b>3,482</b>	<b>29,103</b>

Notes:

(1) Report in thousands (000's).

(2) Actual costs for 2019 are YTD.

### **Financial Summary:**

At the end of the first quarter, on a combined basis, operating and capital expenses for the Market Renewal program were underspent by \$2.2 million and are forecast to be \$6.3 million under budget, which includes \$3.5 million in contingency (not required), by year end. Operating expenses are forecast to be \$2.0 million below plan due to delays in adding resources to the program during the development of capacity high level design and the capitalization of rent. Capital expenses are forecast to be \$0.8 million lower than plan due to delays in resourcing and additional reductions to cost estimates, which is offset by the capitalization of rent and the addition of the Program Delivery Executive.

### MRP - Capital Financial Summary - 31-Mar-19

The capital costs approved under the 2019 Business Plan is to capture the capital expenditures incurred for the Energy and Capacity work streams during the Detailed Design phase throughout 2019. For 2019 Actual costs are being tracked against the Approved Business Plan.

#### Variance Summary and Plan:

The YTD actuals for MRP capital costs are \$1,883K which indicates costs are trending 42% below the YTD budget. The downward trend reflects the underspend associated with a) the delayed onboarding of the Detailed Design consultant, b) delays in the onboarding of planned resources for Detailed Design and c) resources projected as capital remaining to close out of the High level Design Contracts for the Detailed Design consultants are now in place and will be on board by Mid April.

### Overview of MRP Monthly Costs: (000s)

31-Mar-19

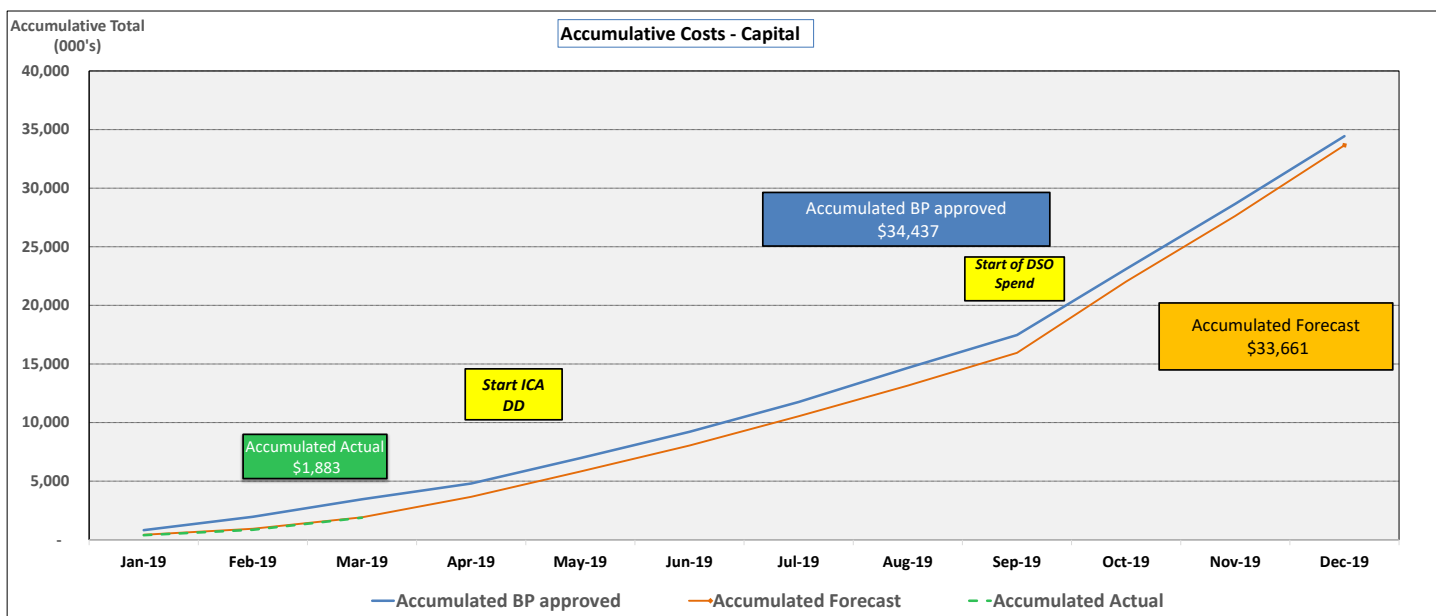
The table below shows the monthly and YTD capital budget, forecast and actual spend, with over/under budget status.

MRP Capital Costs								Year to Date					
Monthly													
Project Name	Budget	Forecast	Actual	Variance Actual vs Budget	Variance %	Status for 31-Mar-19	Comments	YTD Budget	YTD Forecast	YTD Actual	YTD Actual vs Budget	Variance %	YTD Status
Energy	1,191	761	1,015	-176	(15%)	Under Budget		3,007	1,575	1,825	-1,182	(39%)	Under Budget
Capacity	72	63	18	-54	(75%)	Under Budget		216	188	59	-157	(73%)	Under Budget
<b>Total Program</b>	<b>1,263</b>	<b>824</b>	<b>1,034</b>	<b>-230</b>	<b>(18%)</b>	<b>Under Budget</b>		<b>3,223</b>	<b>1,762</b>	<b>1,883</b>	<b>-1,339</b>	<b>(42%)</b>	<b>Under Budget</b>

The Table below shows the month over month and year to date in the actual costs per work stream.

Monthly Comparison - 2019 Capital Actuals													
Project	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD
Energy	365	449	1,015										1,829
Capacity	22	14	18										54
<b>Total</b>	<b>387</b>	<b>463</b>	<b>1,034</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,883</b>

Notes: The graph shows the relationship between the actual costs to date, the approved budget and the forecast projected throughout the year. The increase spike for May is due to the start of the ICA Detailed Design costs, and the expected increase in October is for the DSO Core module spend.



### MRP - Operating Financial Summary - 31-Mar-19

The operating expenses approved under the 2019 Business Plan captures the non-capital costs incurred during the Detailed Design phase of the program throughout 2019. For 2019 Actual costs are being tracked against the Approved Business Plan.

#### Variance Summary and Plan:

Resourcing delays for the program continue and will result in lower than planned compensation expenses for the program, partial offset by higher capital resources. High level design work continues in the first quarter for both Energy and Capacity work streams. The remaining Energy high level design documents were released in December 2018 but work continues in 2019 to review feedback from external stakeholders, perform analysis and reports, and prepare high level designs for approval which resulted in higher operating costs for the energy work stream in both labour and consultant expenses. The Capacity high level design documents were released at the end of March, one month ahead of schedule, which will result in additional compensation savings as resources begin working on capital detailed design work. Additional cost savings has resulted due to the capitalization of rent and the revision of professional & consulting estimates for various initiatives.

The Table below shows in dollars the monthly and YTD the Operating budget, forecast and actual spend; as well as the over/under budget status.

#### Overview of MRP Monthly Costs (000s):

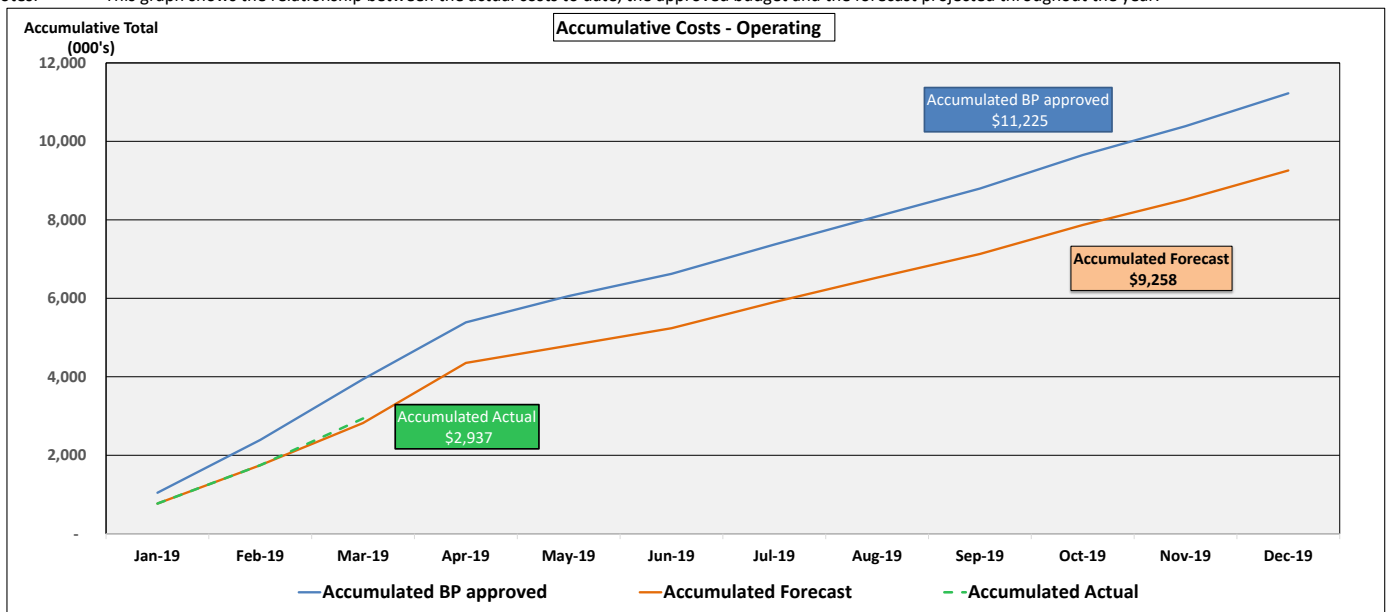
31-Mar-19

MRP Operating Costs								Year to Date					
Project Name	Budget	Forecast	Actual	Monthly		Status for 31-Mar-19	Comments	YTD Budget	YTD Forecast	YTD Actual	YTD Actual vs Budget	Variance %	YTD Status
				Variance Actual vs Budget	Variance %								
Energy	104	273	493	389	375%	Over Budget		270	873	1,093	823	305%	Over Budget
Capacity	915	773	539	-376	(41%)	Under Budget		2,394	1,585	1,351	-1,043	(44%)	Under Budget
General	352	231	154	-198	(56%)	Under Budget		1,098	564	493	-605	(55%)	Under Budget
<b>Total Program</b>	<b>1,371</b>	<b>1,278</b>	<b>1,186</b>	<b>-185</b>	<b>(13%)</b>	<b>Under Budget</b>		<b>3,762</b>	<b>3,023</b>	<b>2,937</b>	<b>-825</b>	<b>(22%)</b>	<b>Under Budget</b>

The Table below shows the month over month and year to date in the actual costs per work stream.

MRP Monthly Comparison - 2019 Operating Actuals													
Project	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	YTD
Energy	250	353	493										1,096
ICA	369	446	539										1,354
General	150	183	154										487
<b>Total</b>	<b>769</b>	<b>982</b>	<b>1,186</b>	-	-	-	-	-	-	-	-	-	<b>2,937</b>

Notes: This graph shows the relationship between the actual costs to date, the approved budget and the forecast projected throughout the year.



**Incremental Resources Notes:**

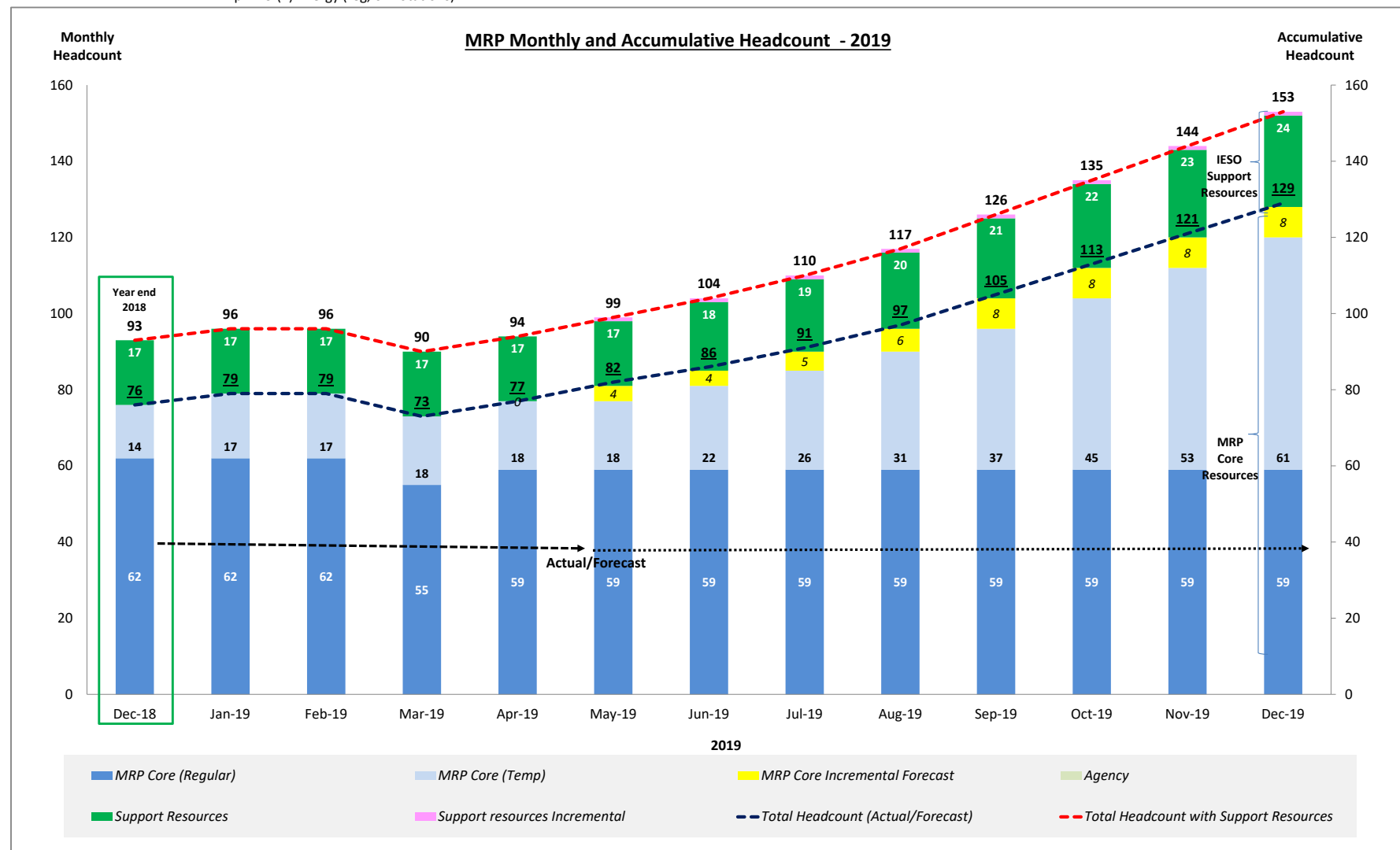
Hiring and onboarding of resources continue to below forecast. RFP for General Project management resources is targeted for end of April.

Jan'19 (3) ICA (temps)

Feb'19 No change

Mar'19 (-6) 1 Energy (reg), 2 ICA (temp) -9 headcount (8 reg+ 1 temp) from Markets returned to business unit

April'19 (4) Energy (reg, on rotations)





## Program: MRP-Market Renewal Program

Project: Total MRP Program

Monthly Schedule Report for MRESC  
March 29, 2019

Document Ref. No.: MRP\_MSR03\_19-03-29  
(MSR ~ 03)

Project Commencement Reporting Date: Jan 1, 2019  
Project Completion Reporting Date: Dec 31, 2019

Reporting Range Period	From January 1, 2019	<<<<<	>>>>>	To March 29, 2019
For Week ending	March 29, 2019			
Reporting Date	April 12, 2019			

### Program Schedule Status

Schedule Baseline	Accumulative Planned % (Baseline)	Accumulative Actual %	Variance %	Schedule Variance <sup>(1)</sup>
	21.6%	16.7%	(-4.9%)	Under Threshold

Schedule Forecast	Accumulative Planned % (Forecast)	Accumulative Actual %	Variance %	Schedule Variance <sup>(1)</sup>
	21.0%	16.7%	(-4.3%)	Under Threshold

### Month End Project Performance Status

Schedule Performance	Planned Value (PV)	Earned Value (EV)	Schedule Performance Index (SPI) <sup>(2)</sup>	Schedule Status <sup>(2)</sup>
	\$8,837,853	\$6,828,315	0.77	Behind Schedule

Cost Performance (Energy & Capacity)	Actual Cost (AC)	Earned Value (EV)	Cost Performance Index (CPI) <sup>(3)</sup>	Budget Status <sup>(3)</sup>
	\$4,327,046	\$6,828,315	1.58	Under Budget

MRP Total Actual Cost	\$4,814,046
-----------------------	-------------

SPI: The program is overall behind schedule, with a cumulative Schedule Performance Index (SPI) of 0.77 compared to 0.79 for the previous month. Delays are explained in each work stream on page 3.

CPI: The program is under budget, with an accumulative Cost Performance Index (CPI) of 1.58, compare to 1.94 for previous month

#### Threshold limits

Index	Red	Yellow	Green
SPI	<0.70	0.70 to 0.90	above 0.9
CPI	<0.80	0.80 to 0.90	above 0.9

#### Legend for Status:

(1)Schedule Variance: Defined as "Under Threshold" if Variance % (delta between Actual Progress Percentage Vs Baseline Planned Percentage) < -10%, "Alarming" if Variance % (delta between Actual Progress Percentage Vs Baseline Planned Percentage) is >= -10%, then the Baseline Schedule should be Re-baseline via program change control process.

(2). Schedule: PMI defined as "Behind Schedule" SPI<1, if SPI>1 "Ahead of Schedule" or if SPI=1 "On Schedule"

(3).Budget: PMI defined as "Under Budget" If CPI >1, if CPI <1 "Over Budget" or if CPI=1 "On Budget"

Note: SPI & CPI will be calculated on Monthly Basis, above CPI value based on YTD actuals.



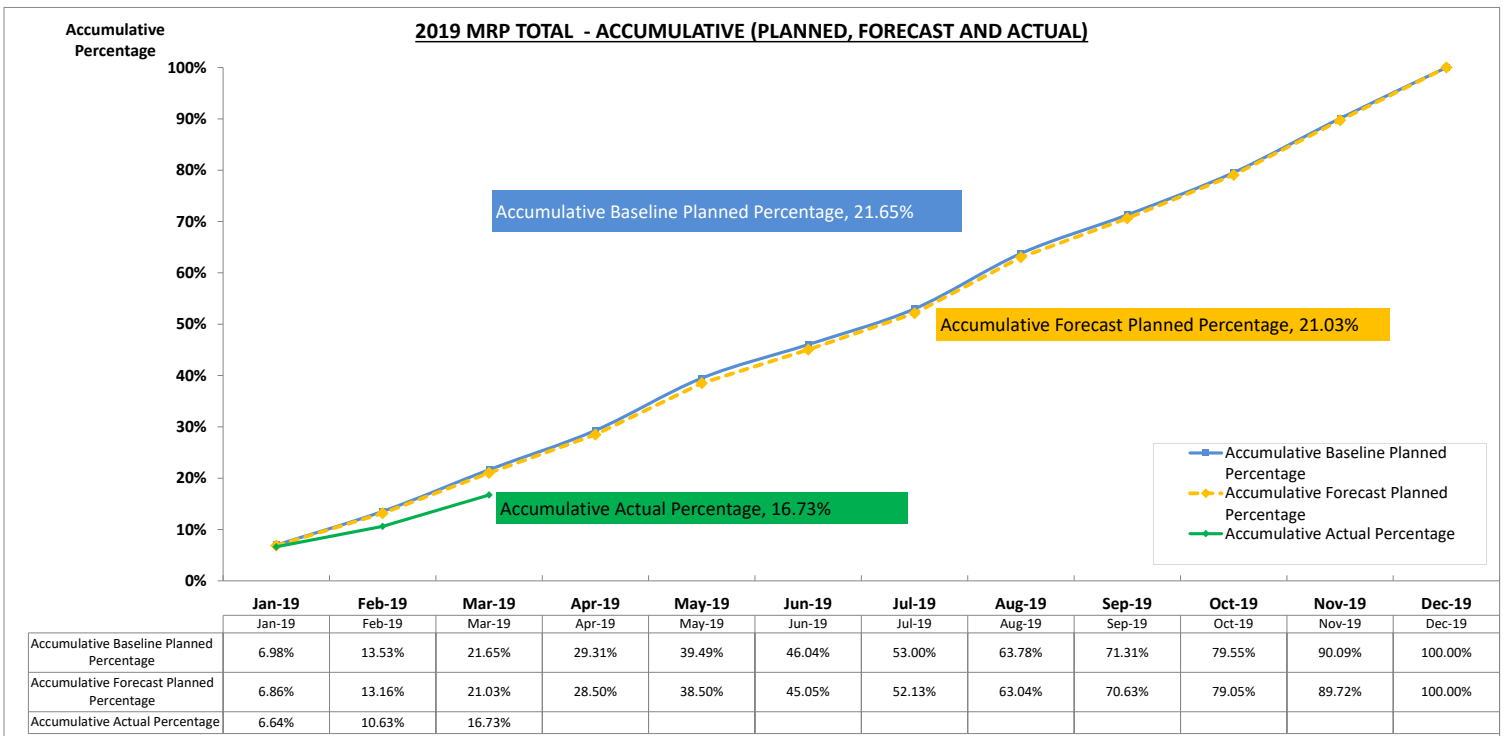
## Monthly Status as of: Mar-2019

PROGRESS INDICATORS										PERFORMANCE INDICATORS			
MRP	2019 Total Budget at Completion (BAC) <sup>(1)</sup>	2019 Total Accumulated Actual Cost (AC)	Budget Equivalent weightage %	Planned Scheduled (start)	Planned Scheduled (finish)	Monthly scheduled Planned%	Monthly Schedule Actual Progress	(Weighted) Schedule % Completed	Variance <sup>(2)</sup>	Earned Value (EV) (BAC X Monthly Scheduled Actual Progress)	Planned Value (PV) (BAC X Monthly Scheduled Planned %)	CPI (EV/PV)	SPI (EV/PV)
Energy	\$25,294,875	\$2,922,067	61.96%	01-Jan-18	31-Dec-18	21.80%	15.28%	9.47%	(-6.5%)	\$3,865,057	\$5,514,283	1.32	0.7
Capacity	\$15,530,704	\$1,404,979	38.04%	01-Jan-18	31-Dec-18	21.40%	19.08%	7.26%	(-2.3%)	\$2,963,258	\$3,323,571	2.11	0.89
Energy & Capacity Sub Total	\$40,825,579	\$4,327,046	100.00%			21.65%		16.73%	(-4.9%)	\$6,828,315	\$8,837,853	1.58	0.77
General	\$4,522,164	\$487,000											
Total	\$45,347,743	\$4,814,046											

Notes:- (1) 2019 Budget at Completion(BAC) values are used for computing the SPI and CPI

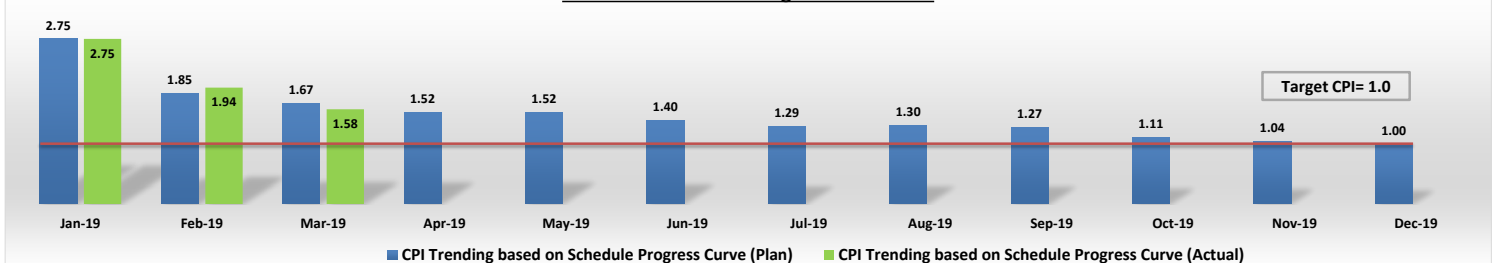
(2) Overall Baseline Schedule Variance for MRP is (-4.9%)

MRP overall Baseline Schedule Variance is (-4.9%), which has increased from -2.9% from the previous month



CPI Trending for the previous two months shows a decline in CPI Value, which is marginally below the targeted forecast.

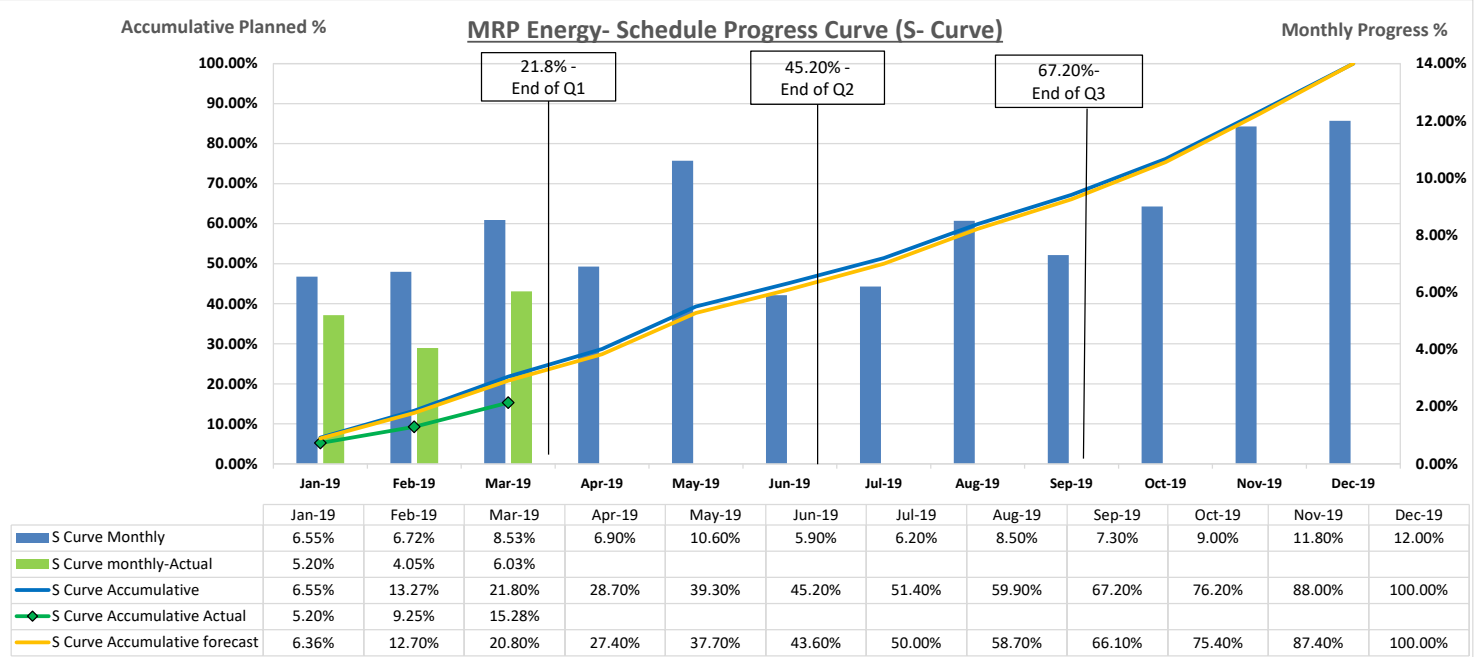
### MRP TOTAL CPI Trending- Plan vs Actual





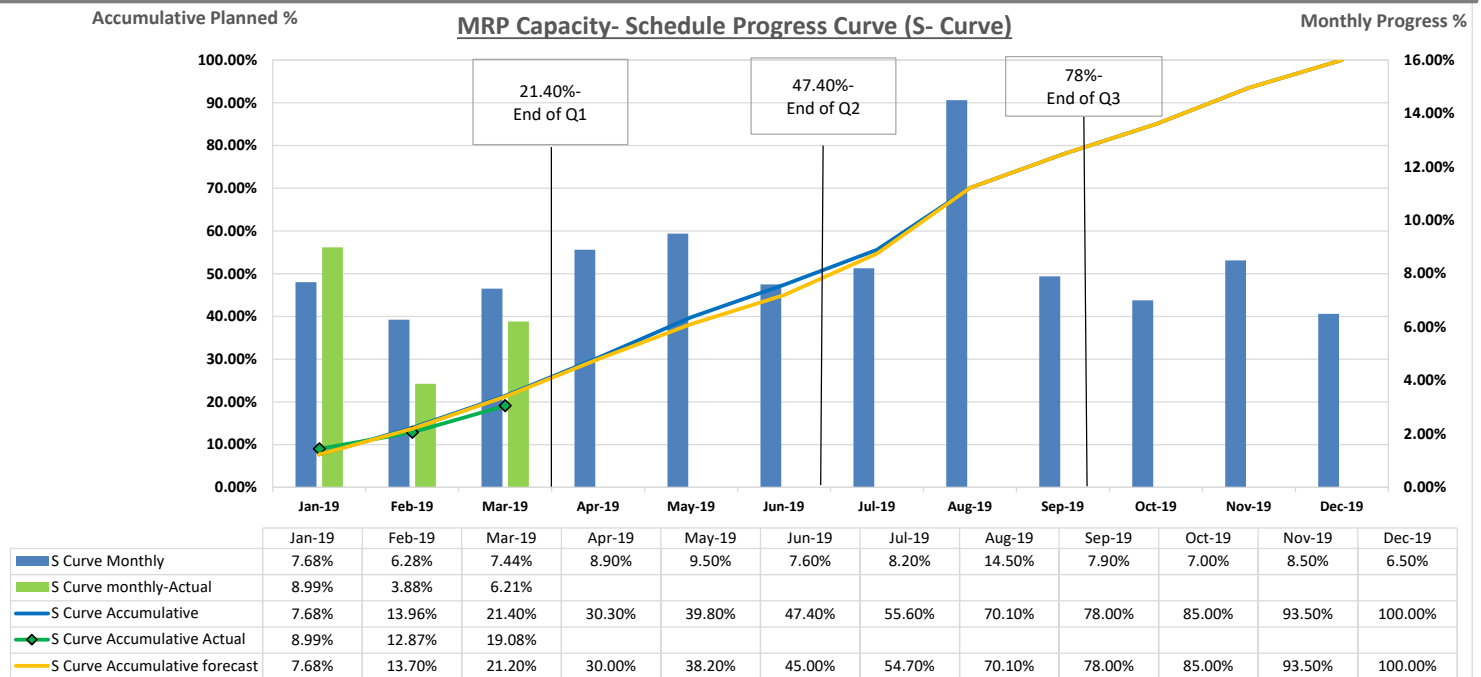
### MRP Energy Progress Curves (Planned Vs Actual)

Accumulative actual Progress trend for the last two months shows deviation of **-6.05%** from baseline planned progress. Delay's are due to Q1 planning process of detailed design execution. The energy schedule is undergoing a revised approach, which is targeting to reduce the amount of work required to complete detailed design document.



### MRP Capacity Progress Curves (Planned Vs Actual)

Accumulative actual Progress trend for the last two months shows deviation of **-2.3%** from baseline planned progress .A focus on the release of the High Level Design resulted in a delay in initiation of Functional Design work across all work groups. The Capacity work stream is still in the planning phase for Functional Design work. As a result, variance between the actual work and planned work increased for the month of March





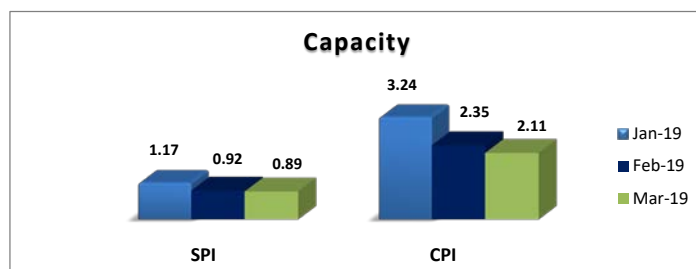
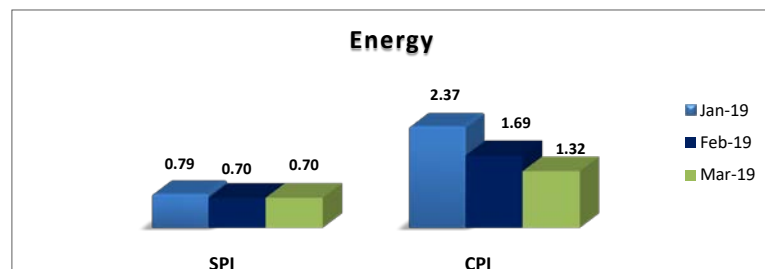
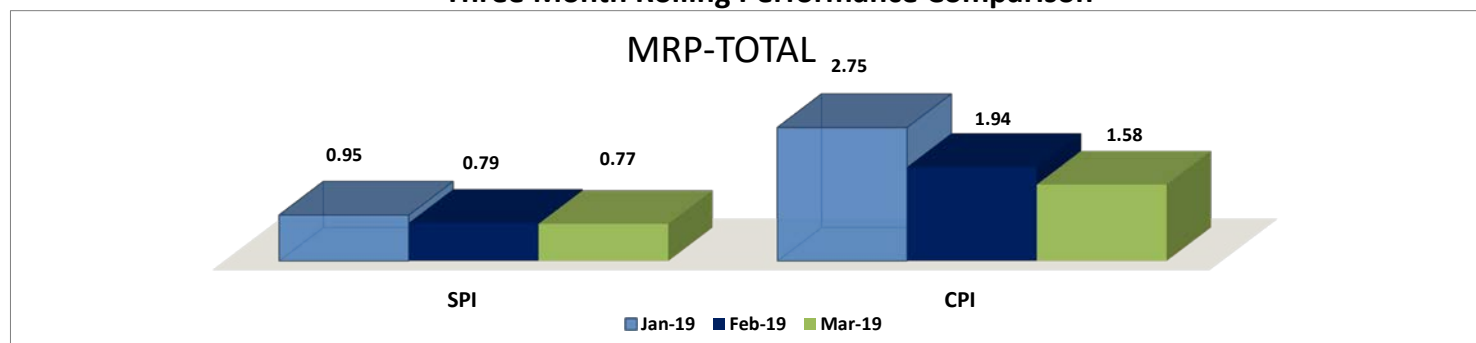
### Energy Work Stream-2019 Milestone Status 29-Mar-19

S.No	Milestone (2019)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	HLD Document External Review Completion (DAM & ERUC)	28-Dec-18	27-Feb-19	28-Dec-18	27-Feb-19	Completed	Completed as Planned
2	HLD -External comments review internal and update doc.(SSM, ERUC & DAM)	28-Feb-19	10-Apr-19	28-Feb-19		In Progress	On Track to be completed on April 10
3	HLD Board Approval (SSM, ERUC & DAM)	12-Jun-19	12-Jun-19			Planned	HLD's to be approved at June 12th Board
4	Vendor on Board- DSO	30-Oct-19	30-Oct-19			Planned	

### Capacity Work Stream- 2019 Milestone Status 29-Mar-19

S.No	Milestone (2019)	Planned Start	Planned Finish	Actual Start	Actual Finish	Status	Remarks
1	HLD First Draft -Deadline for Internal Review 1 comments	29-Jan-19	29-Jan-19	29-Jan-19	29-Jan-19	Completed	Completed as Planned
2	Stakeholder Engagement (March 2019)	20-Feb-19	6-Mar-19	20-Feb-19	6-Mar-19	Completed	Completed as Planned
3	HLD Published Externally	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	Completed	Completed as Planned
4	HLD Internal Sign-off (ELT)	5-Jul-19	18-Jul-19			Planned	
5	HLD Approved (Board)	28-Aug-19	28-Aug-19			Planned	HLD to be approved at August 28th board.

### Three Month Rolling Performance Comparison



#### PMI Definitions:

##### CPI (Cost Performance Index)

The cost performance index (CPI) is a ratio that measures the financial effectiveness of a project by dividing the budgeted cost of work performed (BCWP or EV) by the actual cost of work performed (ACWP or AC). If the result is more than 1, then the project is under budget

##### SPI (Schedule Performance Index)

Schedule performance index (SPI) is a ratio of the earned value (EV) to the planned value (PV).  $SPI = EV \div PV$ . If the SPI is less than one, it indicates that the project is potentially behind schedule to-date whereas an SPI greater than one, indicates the project is running ahead of schedule



## MRP RISK SUMMARY (KPMG KEY RISKS) - MRESC as of Mar 31,2019

Key Risk No.	Identified risk	Risk description	MRP Risk ID	Responsible Officer	Action Owner	Action/Outcome	Document Reference	Status	Target Completion Date	Actual Completion Date
	Resourcing risk	Three resourcing risks that may impact the effective execution of the MRP critical path were identified:								
1		1. Labour market constraints for subject matter experts in electricity markets, engineering, project management, and IT impacting the MRP's ability to attract qualified external resources;	MRP_R010	Under review						
2		2. Limited availability of internal resources with required skillsets; and	MRP_R009	Under review						
3		3. Competing IESO priorities.	MRP_R038	ELT	N/A	IESO divisional Plans and MRP Project Change Request (PCR)		In Progress	2019/06/30	
	External stakeholder risk/ undue stakeholder market influence risk	Three stakeholder key risks were identified:								
4		1. Lack of involvement of external stakeholders in the design process may impact adoption of MRP in the future;	MRP_R014	Under review						
5		2. Certain market participants may exercise significant influence that may impact the market post MRP implementation; and	MRP_R025	Under review						
6		3. External stakeholders are unprepared for system operation at go-live date (emerging risk).	ENG_R014		Program Delivery Executive			Not Started	2019/12/31	
	Regulatory and public policy risk	Two regulatory and public policy risks were identified:								
7		1. The IESO may not be able to demonstrate value-for-money to the regulators for the overall MRP spend; and	MRP_R001			Approval of Business case at Aug Board, with revised market benefits	BC-165	Planned	2019/09/01	
8		2. Provincial policy affects the ability to achieve buy-in for MRP policy support and may result in re-scoping the initiative.	MRP_R025	Under review						
	Design risk	Two design risks were identified:								
9		1. ICA may be overbuilt resulting in unnecessary complexity, exceeding the needs of the Ontario market; and				Approval of HLD		In Progress	2019/09/01	
10		2. Overall MRP design unfairly discriminates against certain resources, locations, consumers, etc.	MRP_R026			Approval of Energy and ICA HLD		In Progress	2019/09/01	
11	System interdependency/ integration risk	The lack of an agreed strategy for a system integration approach (i.e. using an external system integrator vs. internal resources and Accenture support) may lead to significant delays in MRP milestones and cost overruns. This extends to existing system integration requirements including DSO/Settlements.	MRP_R040	Under review						
12	Contract management risk	There is a risk that a strategy has not been fully developed to renegotiate ~4,200 contracts. Specifically, the lack of a clearly defined prioritization or criticality criteria and plan to review, draft, and finalize contracts may result in negotiation delays and stakeholder reputation risk.	MRP_R039			IESO's Approach to Amending Market Participant Contracts in response to the MRP - published on April 12th		In Progress	2019/06/30	
13	MRP Program governance risk	IESO does not perform projects of the MRP magnitude on a frequent basis. Managing the intricacies of these types of complex and interdependent initiatives including implementing an effective governance model is a major challenge for the organization. This may lead to poor project outcomes and significant financial and reputational impacts.	MRP_R041					Planned	2019/06/30	
14	MRP benefits risk (Emerging)	The Market Renewal Program is unable to achieve the estimated benefits outlined in the Benefits Case	MRP_R001			First draft from Brattle on revised benefits expected - week of April 8th.	BC-165	In Progress	2019/09/01	
	Internal stakeholder risk (see Systemic Risk #1 and #2)	Two internal stakeholder risks were identified:								
15		1. Difficulty reaching agreement with internal stakeholders challenges decision-making and could cause delays and jeopardize stakeholder support; and	MRP_R005			Approval of Energy and ICA HLD		In Progress	2019/09/01	
16		2. Lack of internal stakeholder support for the Market Renewal Program.	MRP_R007	Under review						

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**SEC INTERROGATORY 17**

**1.1-SEC-17**

## INTERROGATORY

Please provide an updated Market Renewal Project budget in the same format as provided in response to SEC IR 21 in EB-2018-0143 (Exhibit I, Tab 6.2, Schedule 8.21 SEC 21). Please provide an explanation of all changes in costs since what was provided in response to SEC IR 21.

**RESPONSE**

An updated program budget can be found at Exhibit C-2-1 - Market Renewal Program Cost Report, pages 11 and 12, which includes a description of changes from SEC Interrogatory 21 from 2018 (EB-2018-0143).



1 **SEC INTERROGATORY 18**

2 **1.1-SEC-18**

3 **INTERROGATORY**

4 Please provide the updated Market Renewal Project program milestones in the same format as  
5 provided in response to SEC IR 22 in EB-2018-0143(Exhibit I, Tab 6.2, Schedule 8.22 SEC 22.  
6 Please provide an explanation of the status of all 2018 and 2019 milestones from previous  
7 forecasts and any changes to future milestones.

8 **RESPONSE**

Program Phase	Program Milestone	Target Date (EB-2017-0150)	Status (March 2019)	Forecast Date	Comments
Inception	Benefits Case Finalized	Q1, 2017	Completed	N/A	
Initiation	MRP Stakeholder Engagement & Design Start	Q1, 2017	Completed	N/A	
Initiation	MRP Stakeholder Engagement & Design End	Q3, 2018	In Progress	Q3, 2019	All HLD's have been published and stakeholders are providing feedback.
Planning	Business Case Finalized	Q3, 2018	In Progress	Q4, 2019	Date was revised, as HLD's were not completed.
Design	Detailed Design Start	Q3,2018	Completed	N/A	
Initiation	MRP Stakeholder Engagement & Design - Contingency Start	Q3, 2018	Completed	N/A	
Planning	MRP Stakeholder Engagement & Design - Contingency End	Q4, 2018	In Progress	Q3, 2019	
Implementation	Implementation Start	Q2, 2019	Planned	Q4, 2019	
Design	Detailed Design End	Q4, 2019	Planned	Q4, 2020	
Deployment	In Service: Capacity Auction	Q2, 2020	Planned	Q4, 2022	
Implementation	Implementation - Contingency Start	Q2, 2021	Planned	TBD	
Implementation	Implementation End	Q2, 2022	Planned	Q4, 2022	
Deployment	In Service: Energy	Q2, 2022	Planned	Q2, 2022	
Implementation	Implementation - Contingency End	Q3, 2023	Planned	Q4, 2024	

Filed: April 30, 2019  
EB-2019-0002  
Exhibit I  
Tab 6.1  
Schedule 10.18 SEC 18  
Page 2 of 2

Program Phase	Program Milestone	Target Date (EB-2017-0150)	Status (March 2019)	Forecast Date	Comments
Deployment	In Service Contingency: Capacity Auction	Q2, 2021	Planned	Q1, 2023	
Deployment	In Service Contingency: Energy	Q3, 2023	Planned	TBD	

1 **SEC INTERROGATORY 18**

2 **1.1-SEC-18**

3 **INTERROGATORY**

4 Please provide the updated Market Renewal Project program milestones in the same format as  
5 provided in response to SEC IR 22 in EB-2018-0143(Exhibit I, Tab 6.2, Schedule 8.22 SEC 22.  
6 Please provide an explanation of the status of all 2018 and 2019 milestones from previous  
7 forecasts and any changes to future milestones.

8 **RESPONSE**

Program Phase	Program Milestone	Target Date (EB-2017-0150)	Status (March 2019)	Forecast Date	Comments
Inception	Benefits Case Finalized	Q1, 2017	Completed	N/A	
Initiation	MRP Stakeholder Engagement & Design Start	Q1, 2017	Completed	N/A	
Initiation	MRP Stakeholder Engagement & Design End	Q3, 2018	In Progress	Q3, 2019	All HLD's have been published and stakeholders are providing feedback.
Planning	Business Case Finalized	Q3, 2018	In Progress	Q4, 2019	Date was revised, as HLD's were not completed.
Design	Detailed Design Start	Q3,2018	Completed	N/A	
Initiation	MRP Stakeholder Engagement & Design - Contingency Start	Q3, 2018	Completed	N/A	
Planning	MRP Stakeholder Engagement & Design - Contingency End	Q4, 2018	In Progress	Q3, 2019	
Implementation	Implementation Start	Q2, 2019	Planned	Q4, 2019	
Design	Detailed Design End	Q4, 2019	Planned	Q4, 2020	
Deployment	In Service: Capacity Auction	Q2, 2020	Planned	Q4, 2022	
Implementation	Implementation - Contingency Start	Q2, 2021	Planned	TBD	
Implementation	Implementation End	Q2, 2022	Planned	Q4, 2022	
Deployment	In Service: Energy	Q2, 2022	Planned	Q2, 2022	
Implementation	Implementation - Contingency End	Q3, 2023	Planned	Q4, 2024	

Filed: April 30, 2019  
EB-2019-0002  
Exhibit I  
Tab 6.1  
Schedule 10.18 SEC 18  
Page 2 of 2

Program Phase	Program Milestone	Target Date (EB-2017-0150)	Status (March 2019)	Forecast Date	Comments
Deployment	In Service Contingency: Capacity Auction	Q2, 2021	Planned	Q1, 2023	
Deployment	In Service Contingency: Energy	Q3, 2023	Planned	TBD	



**SEC INTERROGATORY 19**

**1.1-SEC-19**

**INTERROGATORY**

[Ex.C-2-1; EB-2018-0143, 2019 Market Renewal Program Baseline Schedules and Budgets,  
January 2 2019]

- a. Does the IESO have an MRP baseline schedule and budget for years beyond 2019? If so, please provide a copy.
- b. If the answer to part (a) is no, will the Schedule Performance Index (SPI) and Cost Performance Index (CPI) measure baseline be re-set to reflect any updates to the 2020 budget and schedule?

**RESPONSE**

- a. The IESO does not have a baseline schedule and budget for years beyond 2019 at this time.
- b. The IESO is tracking SPI and CPI for 2019 against the baselines for schedule and cost for 2019. The IESO plans to develop baselines for schedule and cost for 2020 to track SPI and CPI for 2020.



**SEC INTERROGATORY 20**

**1.1-SEC-20**

**INTERROGATORY**

[Ex. A-2-2, p.3] The Minister's letter to the IESO approving the Business Plan states that: "I expect future Market Renewal Project resourcing beyond 2019 will be further reassessed in future business plans and in the IESO's proposed expenditure and revenue requirements submitted to the Ontario Energy Board. I hope that the IESO will continue to focus on operating efficiency and ensuring maximum value for ratepayers".

a. Please explain how the IESO expects plans to reassess the MRP resourcing in future business plans and expenditures.

b. Please explain how the IESO proposed expenditures reflect a focus on operating efficiency and ensuring maximum value for ratepayers.

**RESPONSE**

a. MRP is a project and not ongoing line business. The MRP plans include the specific work to be accomplished by the project over a set time period. For the period of 2019, the Energy stream and Capacity stream will each be concluding high level designs, and begin developing detailed designs. Subsequent plans for 2020 will continue detail design and then move to the implementation phase. Resources and expenditures in any period will correspond to the needs of the project to deliver the required scope against the schedule within the budget.

b. Please see the response to OEB Interrogatory 1 a), at Exhibit I, Tab 1.1, Schedule 1.01.



1                                    **SEC INTERROGATORY 21**

2    **1.1-SEC-21**

3    **INTERROGATORY**

4    [Ex. A-2-2, p.2; 2-AA] Please provide a detailed breakdown of the \$38M of proposed MRP  
5    capital. For each material 2 component of the MRP capital, please provide a copy of the business  
6    case, project plan, or similar document. 5

7    **RESPONSE**

8    Please see the response to OEB Staff Interrogatory 26 a), at Exhibit I, Tab 6.2, Schedule 1.26 and  
9    SEC Interrogatory 16, at Exhibit I, Tab 6.1, Schedule 10.16.



**SEC INTERROGATORY 22**

**1.1-SEC-22**

**INTERROGATORY**

[Ex.C-2-1] For each MRP work stream, please provide a breakdown of the Professional & Consulting costs for both 2018 and 2019 that includes: a) name of professional/consultant, b) cost of services, c) description of specific services provided, and d) method of procurement.

**RESPONSE**

A table of the Professional & Consulting costs for both 2018 and 2019 that includes: a) name of professional/consultant, b) cost of services, c) description of specific services provided, and d) method of procurement for each MRP work stream is filed as Attachment 1 to this response.





MRP Costs: Professional & Consulting Services 2018 & 2019							
Name	Workstream	Services Provided	Procurement Type	2018 Actuals Operating (\$ Millions)	2018 Actuals Capital (\$ Millions)	2019 Operating Budget (\$ Millions)	2019 Capital Budget (\$ Millions)
FTI Consulting Services	Energy	Consultant support for High Level Design - SSM	RVOR & RFP	\$0.30			
FTI Consulting Services	Energy	Consultant support for High Level Design - DAM & ERUC	RVOR & RFP	\$0.34			
FTI Consulting Services	Energy	Consultant support for Detailed Design	RVOR & RFP				\$1.68
The Brattle Group	Energy	Consultant support for Detailed Design	RVOR & RFP				\$1.20
SMS LLC	Energy	IT Integration Lead	Single Source		\$0.11		\$0.38
EMS Group NA, LLC	Energy	Design Integration Lead	Single Source		\$0.11		\$0.38
Charles River Associates	Energy	Review of MRPs impact on existing supply contracts	RFS	\$0.31		\$0.05	
Tory's LLP	Energy	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.31			\$0.25
Stikeman Elliot LLP	Energy	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.13			\$0.38
Oslers LLP	Energy	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.08			\$0.19
			Sub total	\$1.48	\$0.22	\$0.05	\$4.44
The Brattle Group	Capacity	Consulting Services High Level Design	RVOR & RFP	\$0.82		\$0.42	\$2.10
SMS LLC	Capacity	IT Integration Lead	Single Source				\$0.38
EMS Group NA, LLC	Capacity	Design Integration Lead	Single Source				\$0.38
Charles River Associates	Capacity	Review of MRPs impact on existing supply contracts	RFS	\$0.04		\$0.05	
Stikeman Elliot LLP	Capacity	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.09			\$0.38
Oslers LLP	Capacity	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.13			\$0.23
			Sub total	\$1.07		\$0.47	\$3.45
The Brattle Group	General	Consultant support for participating in Future Markets	RVOR & RFP	\$0.64		\$1.20	
KPMG	General	Risk Advisory Services for MRP	RFP	\$0.19		\$0.19	
Charles River Associates	General	Review of MRPs impact on existing supply contracts	RFS	\$0.09		\$0.05	
Navigant Consulting Limited	General	Stakeholder Education	RVOR & RFP	\$0.03		\$0.36	
Wilson CTS	General	Recruiting Services for MRP	RVOR & RFP	\$0.08		\$0.08	
Oslers LLP	General	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.03			
Hunton Andrews Kuth LLP	General	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.33			
Stikeman Elliot LLP	General	Legal Support for MRP Designs, supply contract inputs & Governance	RVOR	\$0.04			\$0.25
			Sub total	\$1.43		\$1.89	\$0.25
			Total	\$3.97	\$0.22	\$2.42	\$8.14
			Annual Total	\$4.19		\$10.56	

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**APPrO INTERROGATORY 4**

**6.0 Market Renewal Program**

*6.1 Is the reporting on financial and operational performance of the Market Renewal Program for 2017, 2018, 2019, and proposed future reporting, appropriate?*

**APPRO INTERROGATORY 4**

Reference: Exhibit C-2-1 p 15 and Exhibit I, Tab 6.2, Sch 8.20 in EB-2018-0143

Preamble: Exhibit C-2-1 p 15 states that "Quantification of the project performance measures of Cost Performance Index ("CPI") and Schedule Performance Index ("SPI")" will be available in the 2020 Revenue Requirement Submission for 2019.

Question:

- a) Why are these performance measures not being reported upon for 2018 in this current proceeding, given that the IESO has these figures available as evidenced by the CPI and SPI numbers in the monthly cost reports and monthly schedule reports filed in last year's proceeding under Exhibit I, Tab 6.2, Sch 8.20 in EB-2018-0143?

**RESPONSE**

- a) The IESO initiated calculating, tracking and internal reporting of CPI and SPI during 2018, but the underlying data used to determine those measures was not derived from an approved baseline. The data used in 2018 was an approximated split of a total MRP budget into Energy and Capacity sub-portions. The value of this exercise to the IESO in 2018 was to establish the process to calculate, track and report on these metrics. Baselines for schedule and cost for 2019 were provided to the OEB on January 2, 2019 against which the IESO will track and report CPI and SPI for 2019. Please also see the response to OEB Staff Interrogatory 24, at Exhibit I, Tab 6.1, Schedule 1.24.



**APPrO INTERROGATORY 5**

**6.0 Market Renewal Program**

***6.1 Is the reporting on financial and operational performance of the Market Renewal Program for 2017, 2018, 2019, and proposed future reporting, appropriate?***

**APPRO INTERROGATORY 5**

Reference: Exhibit C-2-1 attachment 1 p 3-4

Preamble: Exhibit C-2-1 attachment 1 p 3-4 states that  $SPI = \text{Earned Value} / \text{Planned Value}$  and  $CPI = \text{Earned Value} / \text{Actual Cost}$

Questions: Please explain how the IESO defines Earned Value and Planned Value, with example calculations.

**RESPONSE**

The IESO uses the earned value definitions and methodology as established by the Project Management Institute (PMI). The following is reproduced from the *Practice Standard for Earned Value Management – Second Edition (2011)*, Project Management Institute.

***Earned Value (EV).*** The measure of the work performed, expressed in terms of the budget authorized for that work.

***Planned Value (PV).*** The authorized budget assigned to scheduled work as of a given reporting date. At any point in time, planned value defines the work that should have been accomplished.

***Actual Cost (AC).*** The realized cost incurred for the work performed on an activity during a specific time period.

**Example Calculations:**

$EV = \text{Budget at Completion} \times \text{Monthly Actual Progress}$

$= \$15,530,704 \times 19.08\%$

$= \$2,963,258$

$PV = \text{Budget at Completion} \times \text{Monthly Scheduled Planned \%}$

$= \$15,530,704 \times 21.40\%$

1      $= \$3,323,571$

2      $AC = \$1,404,979$

3      $SPI = \text{Earned Value} / \text{Planned Value}$

4      $= \$2,963,258 / \$3,323,571$

5      $= 0.89$

6      $CPI = \text{Earned Value} / \text{Actual Cost}$

7      $= \$2,963,258 / \$1,404,979$

8      $= 2.11$

1 **EDA INTERROGATORY 5**

2 Issue 6.1

3 **INTERROGATORY**

4 EDA interrogatory 5

5 Reference: Exhibit C-2-1, Appendix A, pg., 1-2 and Attachment 1 and Attachment 2

6 Questions

7 a) Please provide an updated MRP project timeline.

8 b) Please discuss whether the appropriate activities and undertakings will occur in 2019  
9 such that the renewed market can open and function effectively in 2022.

10 **RESPONSE**

11 a) The MRP's Baseline Schedules and Budget, filed as Exhibit C-2-1, Appendix A,  
12 Attachment 1 and Attachment 2, were provided on January 2, 2019 and is the latest  
13 timeline as of March 31, 2019.

14 b) The IESO is engaged in detailed design activities in 2019 in support of the renewed  
15 market launching in 2022.





**AMPCO INTERROGATORY 20**

**6.0 Market Renewal Program (MRP)**

**6.1 Is the reporting on financial and operational performance of the Market Renewal Program for 2017, 2018, 2019, and proposed future reporting, appropriate?**

**AMPCO-20**

**INTERROGATORY**

Ref: C-2-1 Attachment #1

Preamble: The IESO filed baseline MRP schedules and a budget with the OEB on January 2, 2019.

- a) Please explain why the IESO is not providing an overall CPI and SPI for the total MRP (calculated as a cumulative total of the various program components) in addition to the individual CPI and SPI calculations for each work component.
- b) Please provide the 2019 SPI and CPI results to date for January, February and March.
- c) Please provide the CPI and SPI results for 2018.

**RESPONSE**

- a) The IESO is tracking and reporting on overall CPI and SPI for the total MRP; this will be provided in 2019 as part of IESO's 2020 filing. Please see the response to APPrO Interrogatory 4 a), at Exhibit I, Tab 6.1, Schedule 11.04.
- b) Please see the response to OEB Staff Interrogatory 24 a), at Exhibit I, Tab 6.1, Schedule 1.24.
- c) Please see the response to APPrO Interrogatory 4 a).

