



MISO PJM IPSAC

August 1, 2018

- TMEP Study Status
- Interregional Market Efficiency Study Status
- JOA Updates
- IPSAC Work Schedule



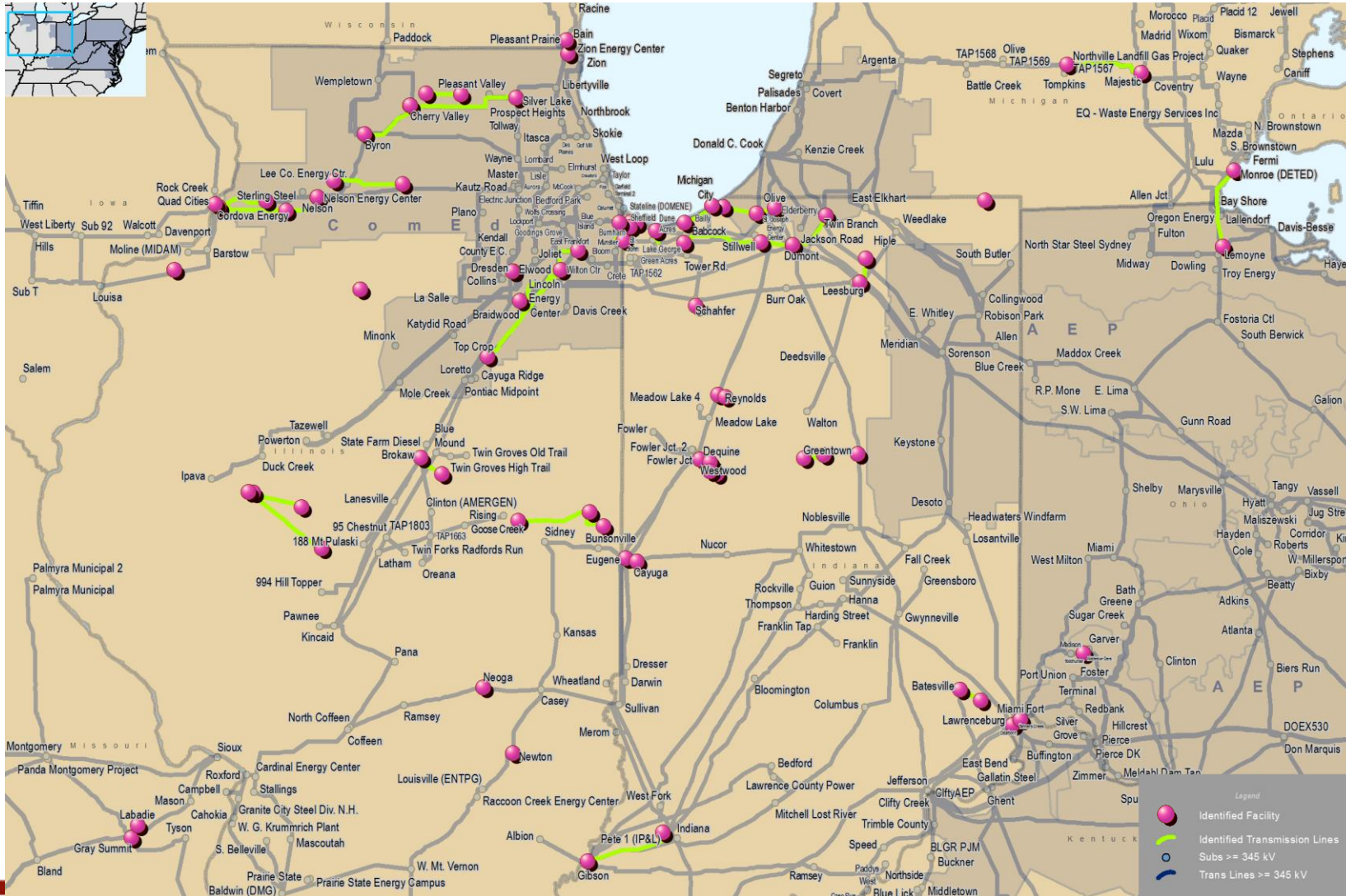
Targeted Market Efficiency Projects

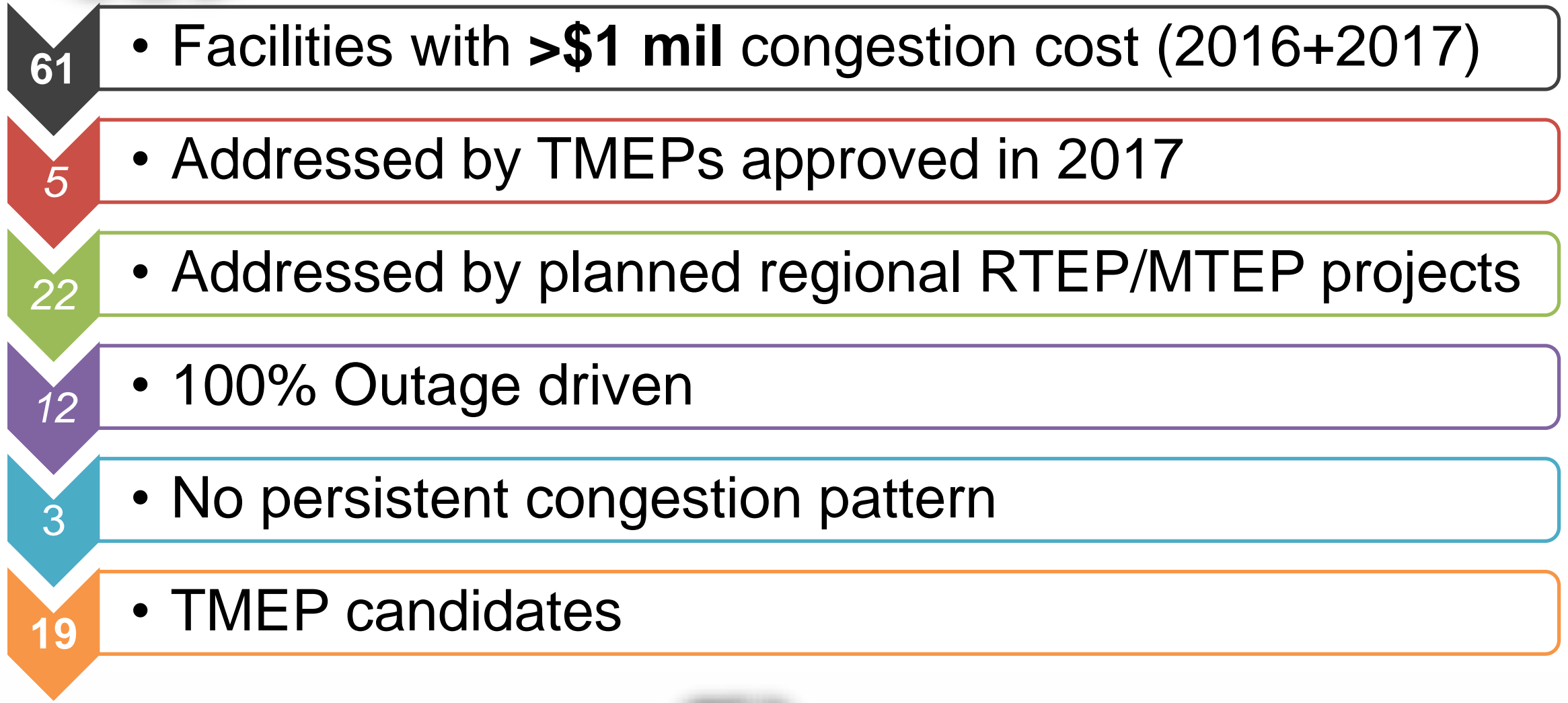
Study Status

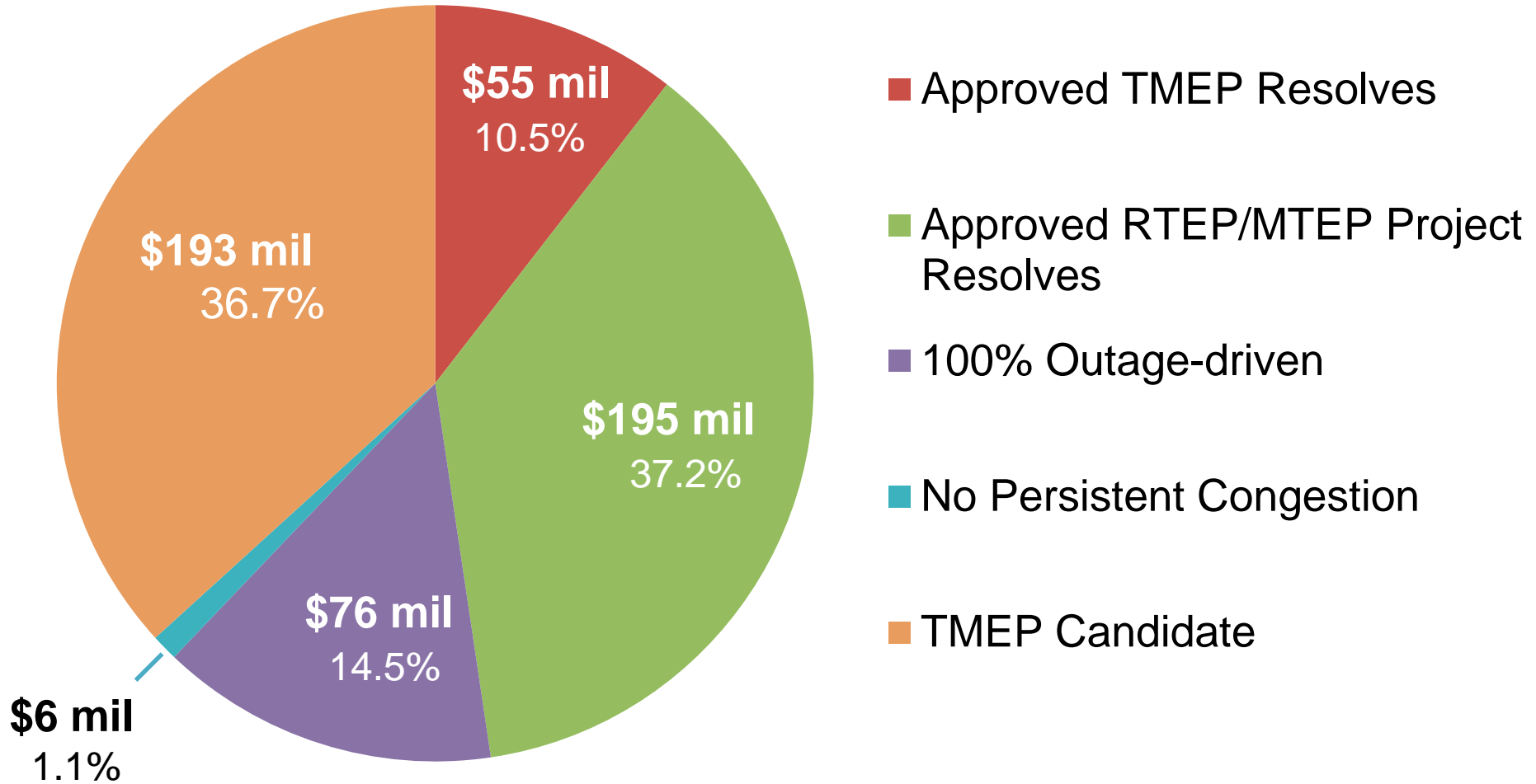
- Historically binding (2016 + 2017) Market-to-Market flowgates
 - Focus on constraints with >\$1million congestion
- ~\$500 million congestion
 - Outages?
 - Expected to continue?
 - Planned upgrades?
 - Viable TMEP type solution?
 - Solution resolve the issue and meet all TMEP criteria?

- Limited to historically binding M2M flowgates
- Projects must be in service by 3rd summer peak
- Projects over \$20 million not eligible (must go through MEP process)
- Benefits based on relieving average of past 2 years of historical congestion (Day Ahead + Balancing)
- Four years worth of benefits must completely cover project's installed capital cost
- Discount/inflation rate not necessary as all projects are near term
- Interregional cost allocation based on congestion relief in each RTO
 - Adjusted by M2M payments

Congested Facility Locations







Facilities Addressed by Approved TMEP Upgrades

Monitored Branch	TO		Upgrade Detail
Magnetation - Reynolds 138	NIPS		b2974 / MISO 14267
Roxana - Praxair 138	NIPS		b2975 / MISO 14268
Burnham - Munster 345	CE	NIPS	b2971 / MISO 14264
Michigan City - Bosserman 138	NIPS	AEP	b2973 / MISO 14266
Lallendorf - Monroe 345	ATSI	ITCT	b2972 / MISO 14265

****Total Cost** = sum of Day Ahead plus Balancing/ECF congestion in PJM and MISO for calendar years 2016-2017

Facilities Addressed by Planned MTEP/RTEP Upgrades (1 of 2)

Monitored Branch	Total Cost** (millions)	TO	Upgrade Detail
Lake George - Aetna 138	\$ 30.0	NIPS	MISO 13283
Batesville - Hubble 138	\$ 28.4	DEI HE	b2634
Mercer IP - Galesburg 161	\$ 21.4	AMIL	MISO Oak Grove - Fargo MVP
Belvidere - 15623 138	\$ 16.8	CE	b2141
Dixon - McGirr Road 138	\$ 15.8	CE	b2119
Marblehead TR1	\$ 15.5	AMIL	MISO Maywood - Ipava - Austin MVP
Byron - Cherry Valley 345	\$ 10.0	CE	b2141
Cherry Valley - Silver Lake 345	\$ 9.1	CE	b2141
Havana E - Havana S 138	\$ 6.4	AMIL	MISO Maywood - Ipava - Austin MVP
Neoga 345/138 kV TR	\$ 6.4	AMIL	MISO Pana - Sugar Creek MVP
Byron - Cherry Valley 345	\$ 6.0	CE	b2141

****Total Cost** = sum of Day Ahead plus Balancing/ECF congestion in PJM and MISO for calendar years 2016-2017

Facilities Addressed by Planned MTEP/RTEP Upgrades (2 of 2)

Monitored Branch	Total Cost** (millions)	TO		Upgrade Detail
Tanners Crk - Miami Fort 345	\$ 5.1	DEO&K	AEP	b2968, b2831
Oak Grove - Mercer 161	\$ 4.1	MEC	AMIL	MISO Oak Grove - Fargo MVP
Loretto - Wilton Center 345	\$ 3.8	CE		b2728
QuadCities - H471 345	\$ 3.4	CE		b2692
Havana - Elkhart Jct 138	\$ 2.7	AMIL		MISO Maywood - Ipava - Austin MVP
Havana S. – Mason City W. 138	\$ 2.4	AMIL		MISO Maywood - Ipava - Austin MVP
N. Champagne - Vermilion 138	\$ 2.1	AMIL		MISO Pana - Sugar Creek MVP
Vermilion - Tilton 138	\$ 1.9	AMIL		MISO Pana - Sugar Creek MVP
Cordova - Nelson 345	\$ 1.6	CE		b2692
Miami Fort 345/138 9 or 10	\$ 1.3	DEO&K		b2634
Lawrenceville – Vincennes 138	\$ 1.2	AMIL	DEI	MISO Pana - Sugar Creek MVP

****Total Cost** = sum of Day Ahead plus Balancing/ECF congestion in PJM and MISO for calendar years 2016-2017

Facilities Where Congestion Was 100% Outage Driven

Monitored Branch	Total Cost** (millions)	TO		Outage Detail
Cherry Valley 345/138 TR81	\$ 33.9	CE		Cherry Valley 345/138 TR83
Cayuga Starbus TR 9	\$ 15.2	DEI		Cayuga XFMR and Greentown XFMR
Greentown 765/138 T2	\$ 7.6	AEP	DEI	Dumont - Greentown
Dumont 765/345 1	\$ 4.5	AEP		Dumont 2
Hegewisch - 17714 2 138	\$ 2.7	DEI	CE	BLUE -177 BURN 17702
New London – Kokomo	\$ 2.6	DEI		Parallel Kokomo transmission (<i>planned</i>)
Bosserman - Olive 138	\$ 1.8	AEP		Dune Acres XFMR
Eugene - Cayuga 345	\$ 1.8	AEP	DEI	Meadow Lake - Olive
Babcock - Stillwell 345	\$ 1.7	NIPS		Babcock - Dune Acres
ChicagoAve - Praxair 138	\$ 1.6	NIPS		Dune Acres XFMR
Labadie - Graysum 345	\$ 1.6	AMMO		Labadie - Mason
Hennepin - 6101 138	\$ 1.0	CE	AMIL	Nelson - Electric Jct

**Total Cost = sum of Day Ahead plus Balancing/ECF congestion in PJM and MISO for calendar years 2016-2017

Monitored Branch	Total Cost** (millions)	TO	
Dumont - Twin Branch 345	\$ 2.9	AEP	
Tompkins - Majestic 345	\$ 1.8	METC	ITCT
Nelson 345/138 TR84	\$ 1.2	CE	

- TMEPs are intended to address persistent issues which are expected to continue in the future.

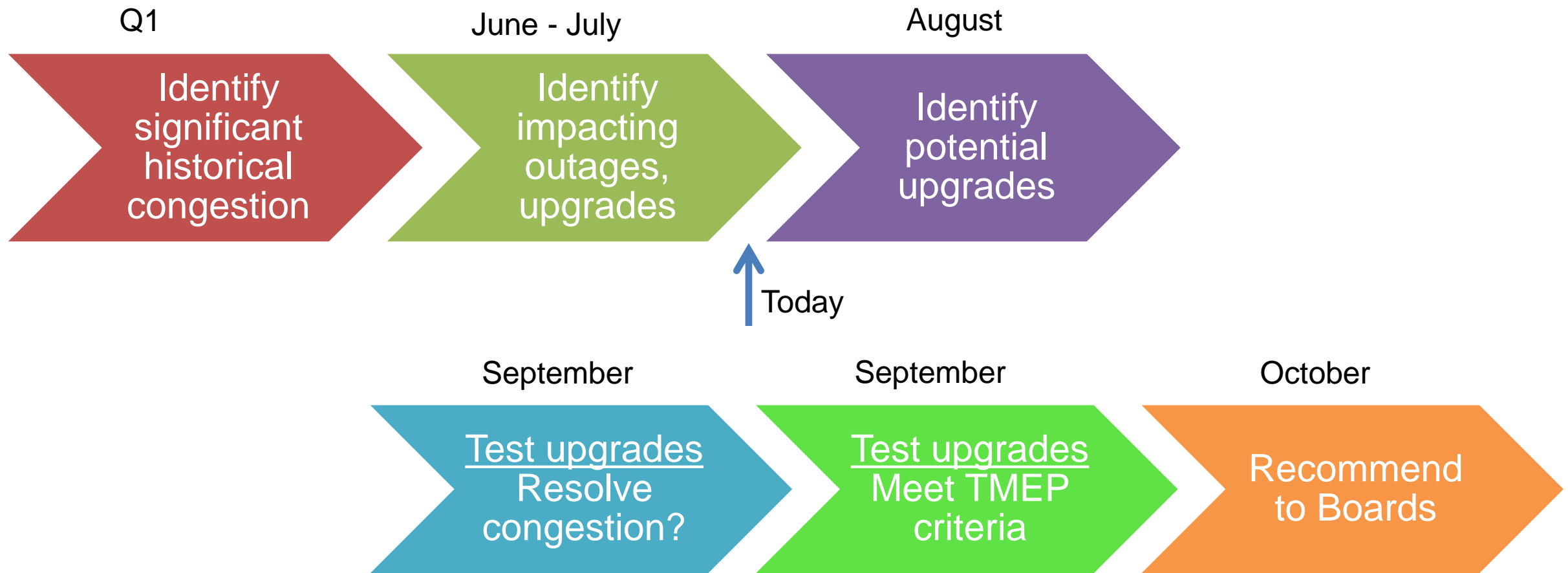
****Total Cost** = sum of Day Ahead plus Balancing/ECF congestion in PJM and MISO for calendar years 2016-2017

Monitored Branch	Total Cost** (millions)	TO	
Westwood 345/138 BK1	\$ 52.7	DEI	
Cherry Valley 345/138 TR82	\$ 46.9	CE	
Shadelnd - Lafaysouth 138	\$ 22.5	DEI	
Gibson - Petersburg 345	\$ 9.8	DEI	IPL
Zion 22 - Pleasant Prairie 345	\$ 8.6	WEC	CE
Braidwood – E. Frankfort 345	\$ 5.0	CE	
DuneAcre - MichiganCity 138	\$ 4.8	NIPS	
Zion 22 - Zion 974 345	\$ 4.6	CE	
Dresden 345/138 TR83	\$ 4.5	CE	

****Total Cost** = sum of Day Ahead plus Balancing/ECF congestion in PJM and MISO for calendar years 2016-2017

Monitored Branch	Total Cost** (millions)	TO	
Newton 345/138	\$ 3.9	AMIL	
Todd Hunter 345/138	\$ 3.8	DEO&K	
Nelson 345/138 TR82	\$ 3.7	CE	
Dumont – Stillwell	\$ 3.5	AEP	NIPS
Zion 974 - Pleasant Prairie 345	\$ 3.4	CE	CE
Brokaw - Leroy 138	\$ 3.3	AMIL	
Garden Plain - 15518 138	\$ 2.7	CE	
Michigan City - Trail Creek 138	\$ 2.7	NIPS	
NW Tap - Purdue 138	\$ 2.6	DEI	
Leesburg - Northeast 138	\$ 2.1	NIPS	


****Total Cost** = sum of Day Ahead plus Balancing/ECF congestion in PJM and MISO for calendar years 2016-2017



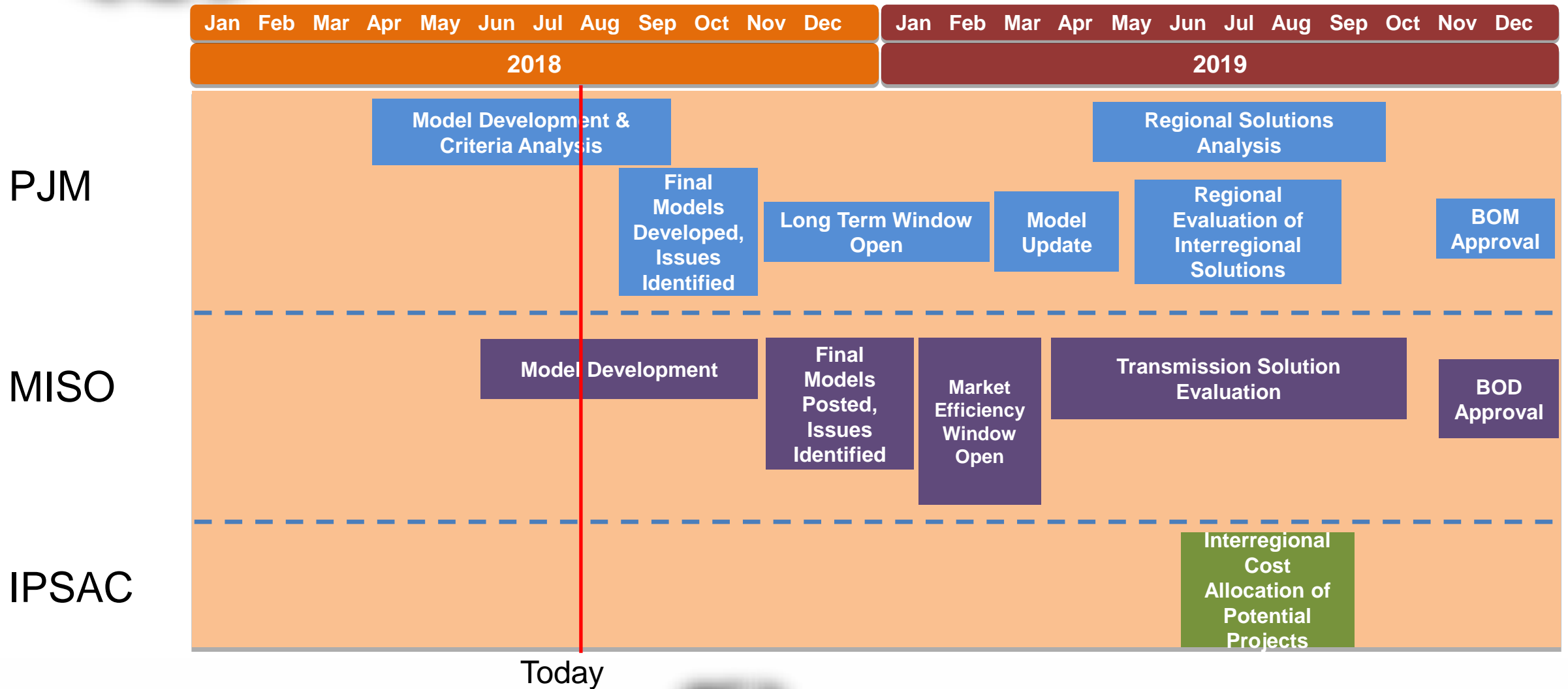


Interregional Market Efficiency Projects Study Status

- **PJM and MISO will conduct a two year Interregional Market Efficiency Project (IMEP) study in 2018/2019**
- Issues identification and benefit determination conducted in each regional process consistent with current effective JOA

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- Study progresses in parallel through PJM and MISO regional processes
 - Each RTO will develop an economic model and identify issues for which upgrades are being solicited
 - Model and issues identification consistent with region process and practice
 - Interregional proposals must:
 - Address at least one identified issue in each region (could be same issue if identified by both RTOs)
 - Be submitted to both regional processes

Market Efficiency - Estimated Timeline



JOA Updates

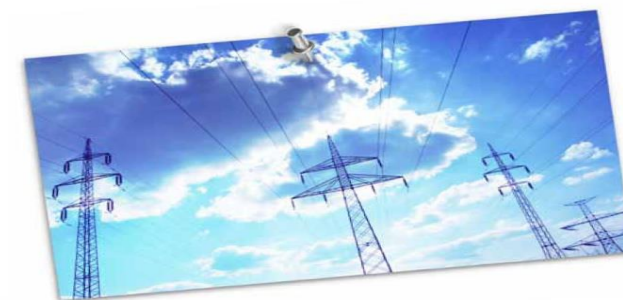
- Teed up discussion October, 2017
- Sought stakeholder feedback January
- Reviewed feedback with IPSAC March
- Presented draft redlines June
- Expected filing version included with today's meeting materials

- Remove 5% GLDF criteria; materiality determined by regional processes
- Clean up as required to reflect no joint model for IMEP study
- Clarify obligation to construct (project in one region benefiting the other)
- Eliminate Cross Border Baseline Reliability Project (CBBRP) type
- Remove Section 9.4.4.3 (allocation outside of CSP)
 - Relies on joint model
 - Annual issues review still allows RTOs opportunity to find projects outside of joint study and include in the CSP


- Target having all changes effective for next IMEP process
 - Window opens around November 1, 2018
- RTOs expect to file in the next couple weeks

IPSAC Work Schedule

- File JOA updates at FERC
- Solicit TMEP limiting equipment and potential upgrades from equipment owners
- IPSAC in ~early October to review TMEP study results
- Interregional MEP proposal windows opens around November 1 (PJM) and January 1 (MISO)



Open Discussion

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- 7/27/2018 – Original version posted
- 7/31/2018 – Added map on slide 6