

Market Renewal Working Group

September 24, 2018

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Agenda

1:00 pm – Welcome and Introduction

1:15 am – Engagement Update and Plan

1:30 pm – Energy Update

2:00 pm – NERSC Update

2:15 pm – Break

2:30 pm – Southwest Power Pool (SPP) presentation

3.15 pm – Midcontinent Independent System Operator (MISO) presentation

4.00 pm – Wrap up



Upcoming Dates

MRWG

- Next meeting: October 17

Capacity

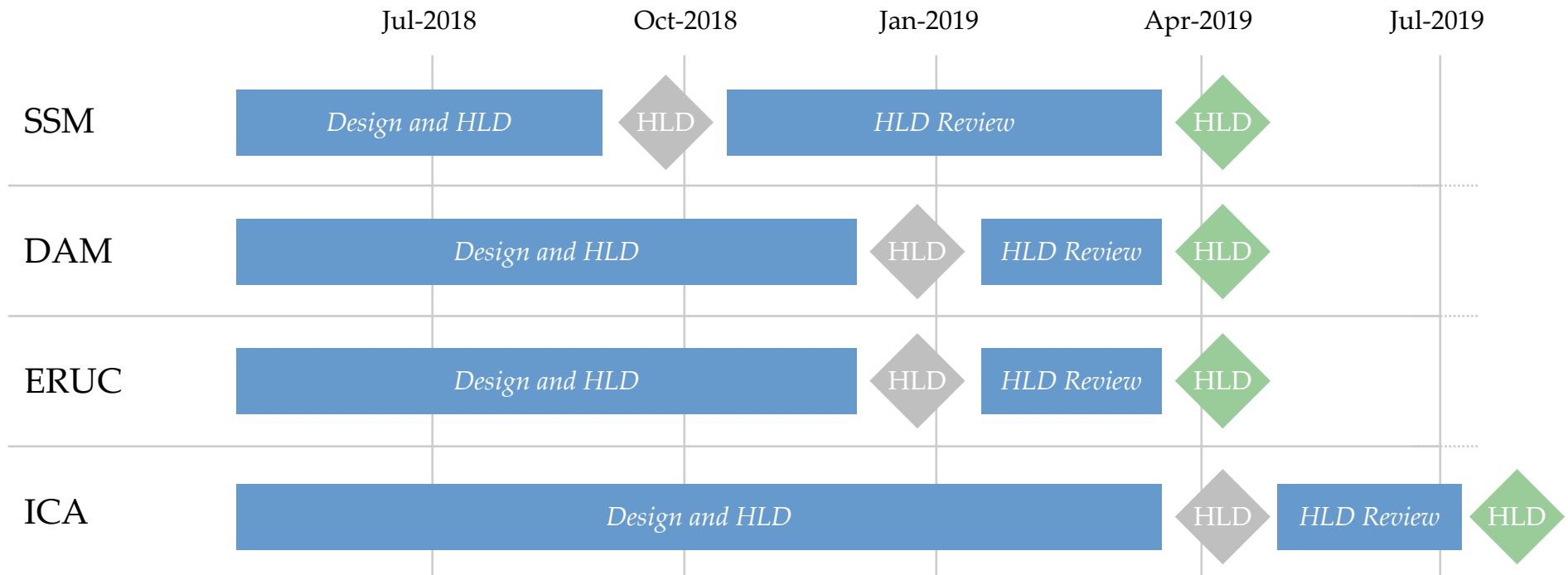
- Participation Model – Preliminary Decisions and Demand Curve Analysis: October 18 and 19

Energy

- Next DAM and ERUC stakeholder engagement sessions scheduled for end of November (exact date TBC)



Energy and Capacity Timelines

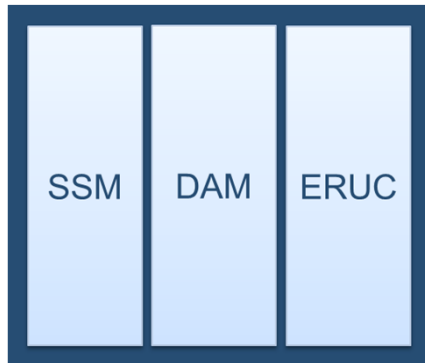


 = DRAFT HLD published
  = HLD final

ENGAGEMENT UPDATE



Transitioning from HLD to Detailed Design



What is the best way to organize the Energy initiatives for the next phase of the project?

- *Effective organizational structure and accountabilities*
- *Internal alignment and engagement*
- *External engagement*

High Level Design (HLD)

- Encapsulates the key concepts and high level decisions for a MRP initiative

Detailed Design (DD)

- Detail necessary to develop system tools and processes
- Market Rules

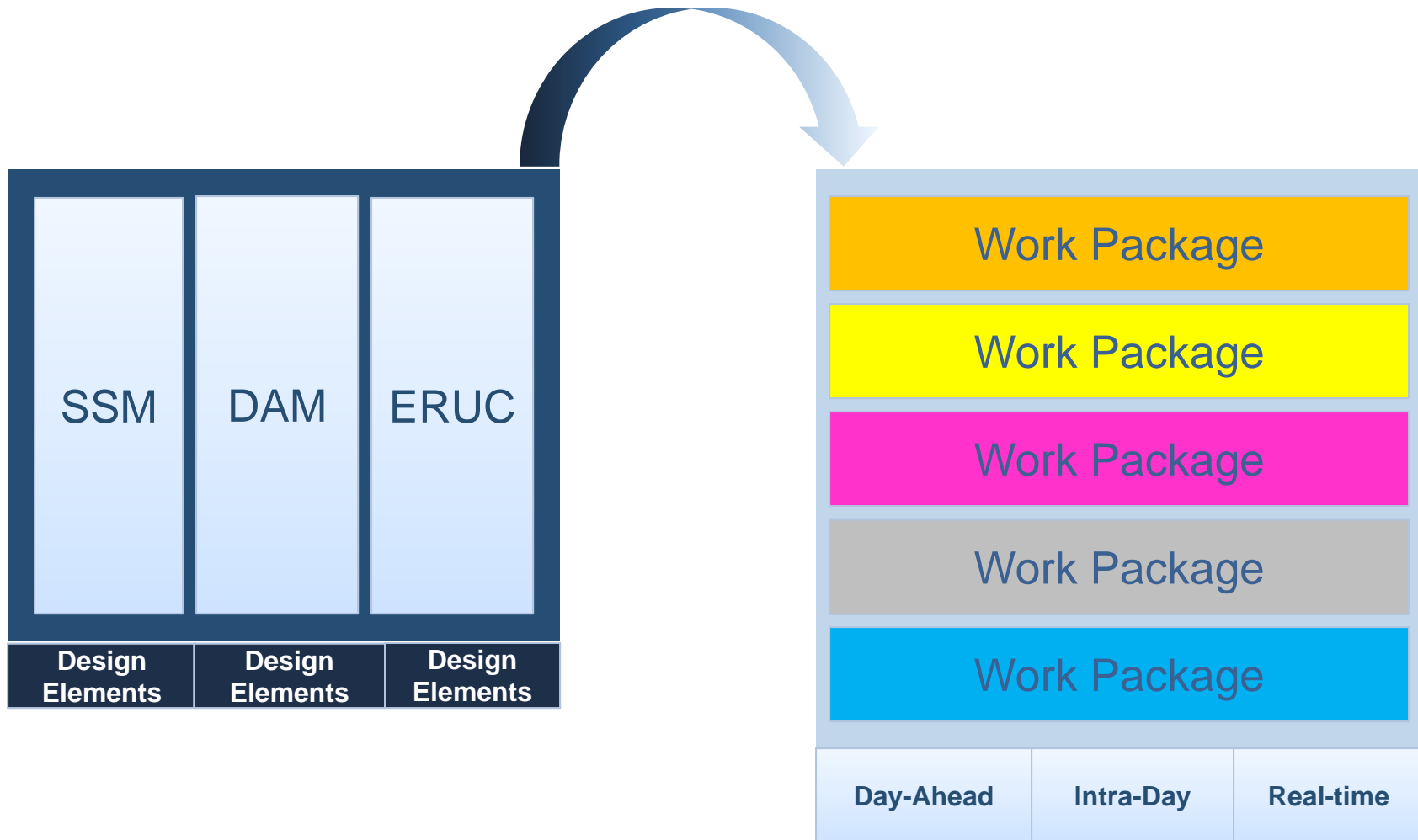
Testing & Implementation

- Market Rules & Manuals
- MRP initiative goes into service

Stakeholder Engagement

Education / Awareness / Feedback / Strategic Issues / Training

Pivoting the Energy Workstream



Work Package Approach

Detailed Design Planning Principles

The scope of work is arranged to maximize inherent integration and minimize seams issues ("work packages")

Each work package owns the end-to-end design of a specific functionality

Each work package contains elements that can begin as soon as both design maturity and resource availability is attained

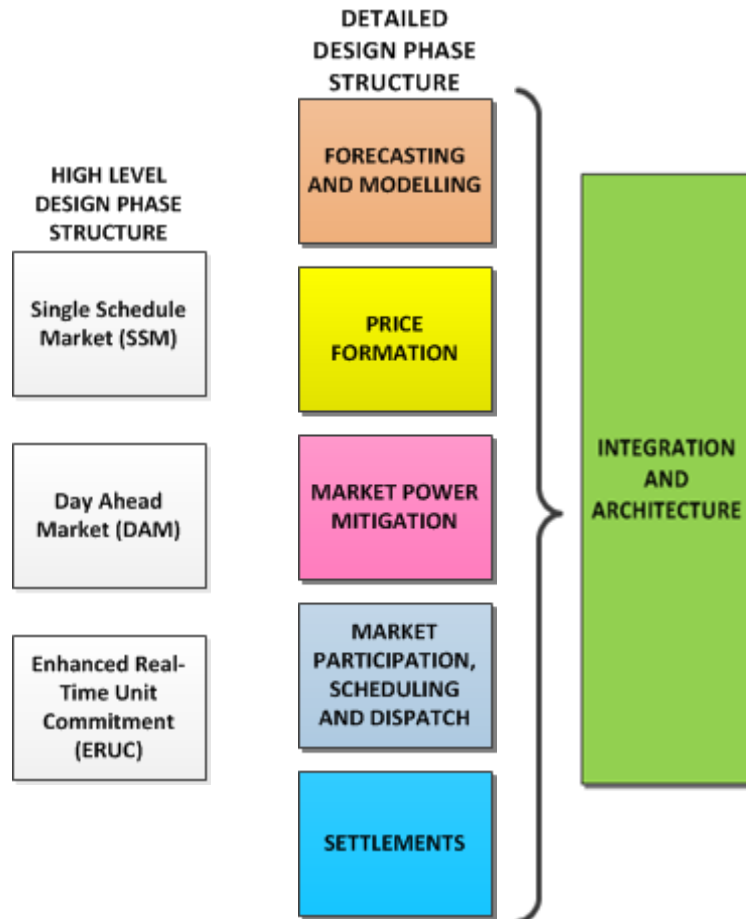
Each work package owns an equal distribution of difficult/complex design topics

Each work package owns an equal distribution of internal or external stakeholder engagement effort

The work package structure optimizes the use of internal and external stakeholder participation

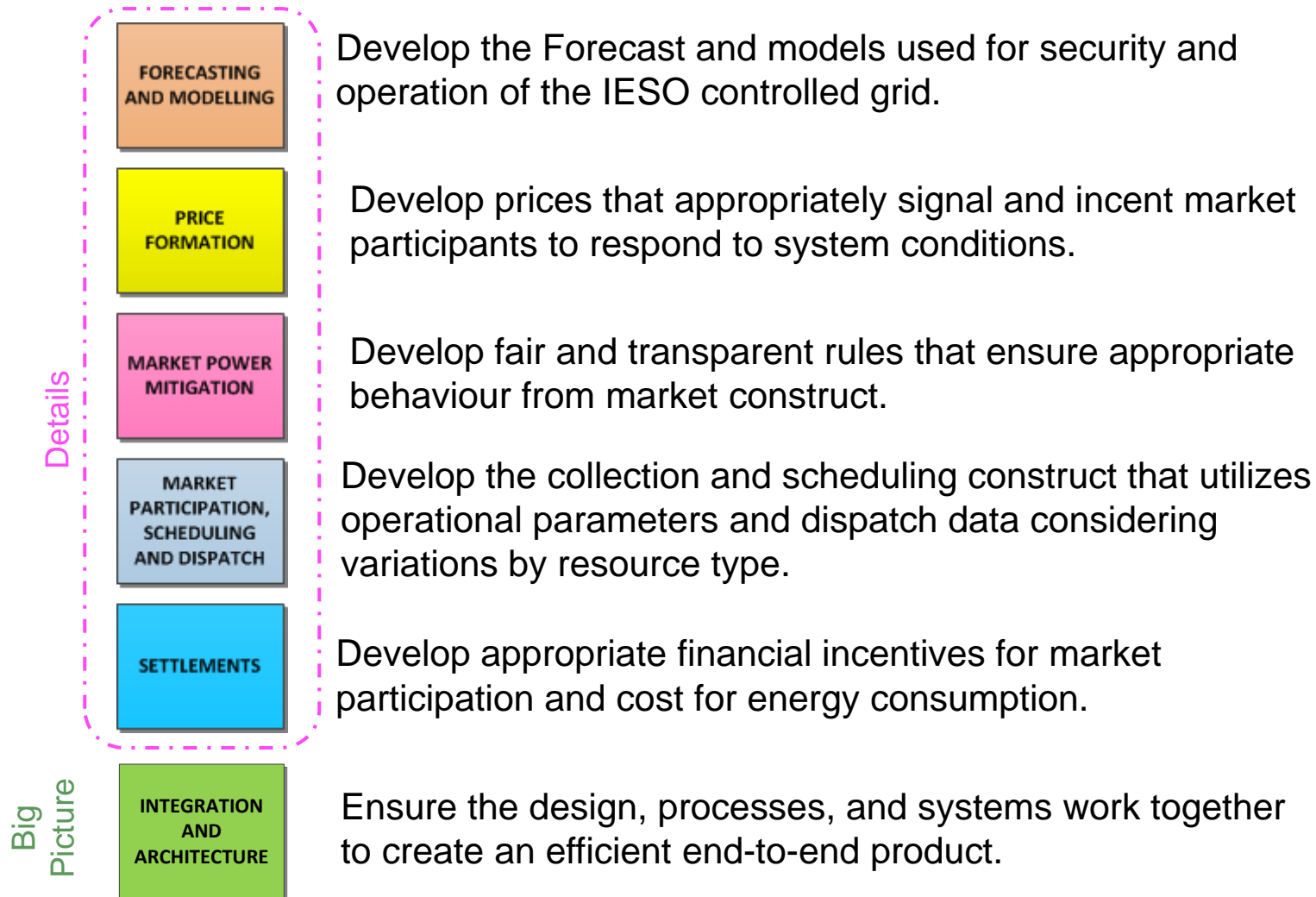
Key principles used to develop the Detailed Design structure

New Detailed Design Structure



An Integration and Architecture Team will be created to ensure all designs, processes, and solutions will work together.

Work Package Objectives



Work package Seams in Detailed Design

Example of Work Package Seam analysis conducted for Detailed Design

Seams					
	Price Formation (PF)	Market Power Mitigation (MPM)	Market Participation, Scheduling and Dispatch (MPSD)	Settlements (SETT)	Tools, Process Integration (I&A)
Modelling and Forecasting (M&F)	PF must define pricing node and zone requirements for PSM.	MPM must provide pricing node to resource mapping and common system constraint data to MPSD for BCA and NCA definitions.	MPSD must define any special modelling requirements per resource, for example the addition of PSU units at each NQS facility. M&F must inform MPSD of modelling improvements that impact their design, for example using 1 trading node on the interties. M&F must ensure the NDL forecast calculation aligns with the PRL, DL and HDR bidding expectations from MPSD.	SETT must ensure Settlements deliver on the required financial incentives to ensure they drive the correct operational incentives.	Functional passes for MPM and pricing need input from PF.
Price Formation (PF)		PF must ensure NDL calculation curve appropriately impacts dispatch given the MPO design.	MPM must ensure Settlements can deliver on the CU process design requirements.	SETT must ensure Settlements can deliver on the required financial incentives with the design resource needs, for example queue-unk make whole payments.	Functional passes for MPM and pricing need input from MPM.
Market Power Mitigation (MPM)		MPM must provide MPO with any offer and operational parameters to inform participation design. MPO must provide details of reliability conditions and flag to inform MPM design.	MPM and Settlements must establish a system for handling NDL/liquidity relating to MPM costs. MPO must ensure Settlements can deliver the required financial incentives with the design resource needs, for example queue-unk make whole payments.	SETT must ensure Settlements can deliver the required flag for specific activities impacting charge types. MPO should review settlement equations to ensure they drive the correct operational incentives.	
Market Participation, Scheduling and Dispatch (MPSD)					
Settlements (SETT)					

Seams

	Price Formation (PF)	Market Power Mitigation (MPM)	Market Participation, Scheduling and Dispatch (MPSD)	Settlements (SETT)	Integration & Architecture (I&A)
Forecasting and Modelling	PF must define pricing node and zone requirements for M&F.	M&F must provide pricing node to resource mapping and common system constraint data to MPM for BCA and NCA definitions.	MPSD must define any special modelling requirements per resource, for example the addition of PSU units at each NQS facility. M&F must inform MPSD of modelling improvements that impact their design, for example using 1 trading node on the interties. M&F must ensure the NDL forecast calculation aligns with the PRL, DL and HDR bidding expectations from MPSD.		

Anticipated improved seams management with proposed work package structure

Next Steps

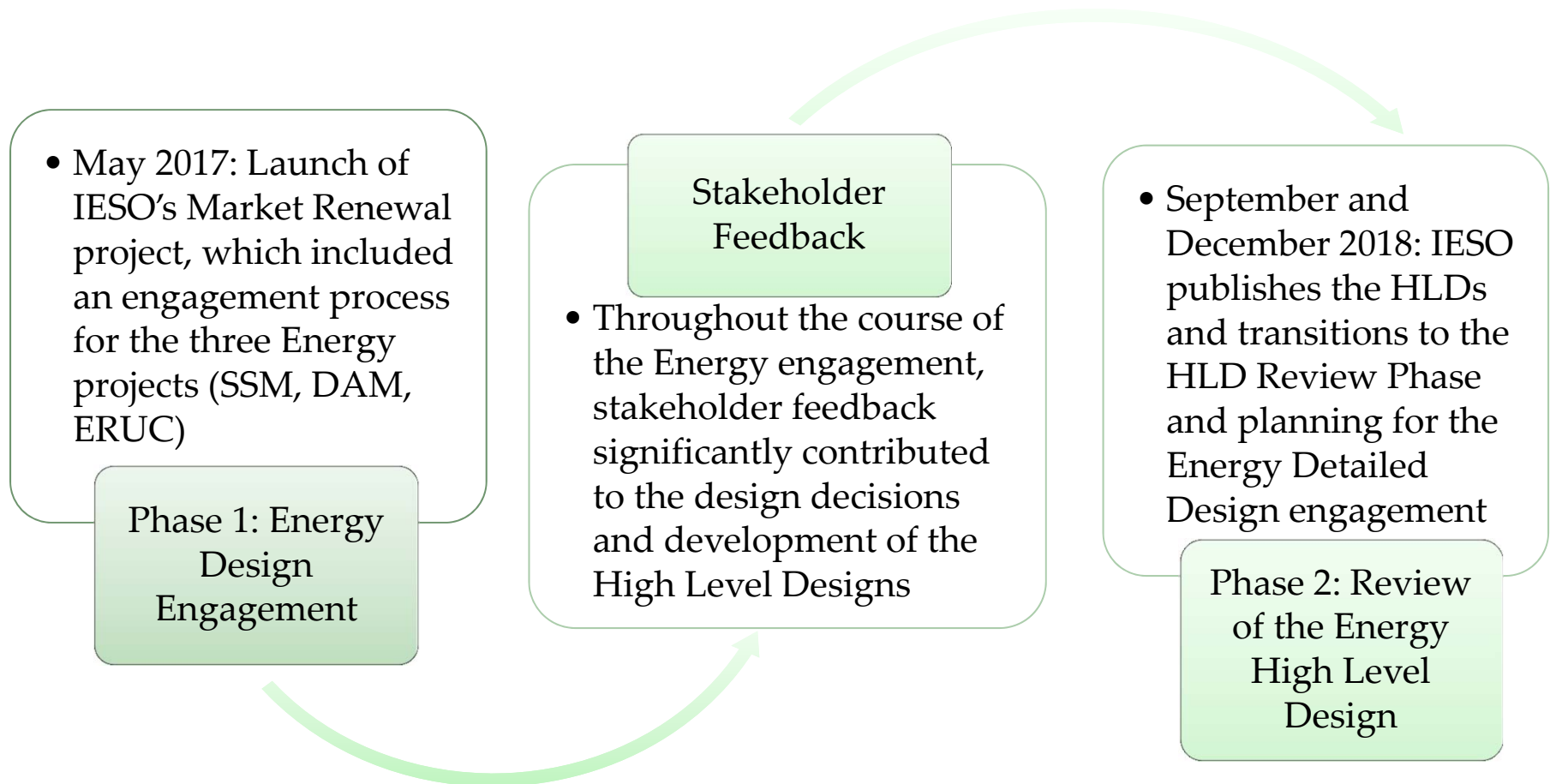
- Project will be pivoted to the new structure over the next few months
- We will be releasing an engagement plan for stakeholder comments this fall



ENGAGEMENT PLAN



Recap | Market Renewal project



Engagement Approach

- At the introduction of the engagement, the IESO hosted three education sessions to facilitate stakeholder participation in engagements across the MRP
- A diverse set of stakeholders representing all sectors participated in the engagement
- The IESO received stakeholder feedback during and after each meeting, and its responses showed how stakeholder feedback was used
- Feedback on design elements informed the decisions reflected in the HLD and helped lay a strong foundation for the detailed design phase

Engagement Objectives

As we transition from High Level Designs to Detailed Designs, the engagement approach will evolve to meet stakeholder needs:

- **Broaden outreach** – ways to accomplish this will include: utilizing IESO account management contacts for market participants and industry associations and LDCs for lower volume resources connected to the distribution network
- **Build Capability** - Host education and awareness sessions throughout the fall to build capability for participation during the engagement phase; conduct training sessions for market participants in 2019 until implementation
- **Tailor engagement to needs** - Engage stakeholders in the appropriate Work Packages based on their expertise to more effectively and efficiently develop the Detailed Design

Upcoming Engagement Phases & Activity

Phase 2: Review High Level Design

- 8 week review of HLD, SSM: September 25 – November 20; DAM & ERUC late December to late February
- SSM Q&A Session, late October
- SSM Feedback Form due, November 20
- 1:1 meetings available, as requested
- Education & Awareness Sessions, by year end

Phase 3: Detailed Design Engagement*

- October 2018: Post draft DD stakeholder plan for comments
- January 2019: Meeting to map HLD design elements to Work Packages
- March 2019: Meeting for detailed scoping of each Work Package
- April 2019: Begin engagement meetings on individual Work Packages

Phase 4: Implementation & Training

- Market rules and manuals development
- A more detailed training plan for the market will be available as the DD engagement phase nears its completion in order to ensure organizations are prepared for the implementation
- Need to ensure coordinated implementation across the sector

**Stakeholders are encouraged to start considering the appropriate resources for the targeted Work Packages approach in the DD engagement (next slide)*

Expected Timelines – Detailed Design

- Next Steps:
 - October 2018: Engagement Plan for DD posted for stakeholder comment
 - January 2019: Meeting to frame the Detailed Design work packages by reviewing the design elements and process
 - March 2019: Stakeholder meeting to describe the details of the work packages to ensure engagement can begin once the final HLD documents are posted in April
 - April 2019: Release of final HLD documents and begin engagement meetings on individual work packages



Questions for Stakeholder Input

- What are some ideas for broadening engagement from under-represented groups?
- Which areas should be our focus for education and capacity-building to support effective participation?
- With respect to the Detailed Design engagement approach, are the introduction of work packages an effective way to utilize stakeholder time and expertise?
- Other feedback?

Please submit any feedback or questions to IESO Engagement at engagement@ieso.ca

ENERGY UPDATE



SSM

- September stakeholder engagement included:
 - Revised decisions on:
 - Intertie congestion pricing and Congestion Rent and Loss Residual allocation methodology
 - Additional information:
 - A review of the decisions and guidelines made thus far on Market Power Mitigation
 - An introduction to the review process for the HLD document



DAM

- September stakeholder engagement included:
 - IESO moving to zonal demand forecasting
 - Settlement of Hourly Demand Response (HDR) bids in DAM
 - Software requirements to facilitate the hydro-electric optimization in DAM and pre-dispatch
 - Guidelines for determining real-time make whole payments during detailed design
 - Capturing NQS resource ramp schedules in the DAM



ERUC

- September stakeholder engagement included:
 - Overview of the new pre-dispatch process
 - Shared stakeholder feedback on Look Ahead Period, Timing & Frequency and Intertie Transactions



NERSC



NERSC Modelling exercise

- The NERSC modelling exercise aims to test the robustness of the future energy, capacity, and ancillary service markets across a range of stakeholder developed plausible scenarios
- Additional change cases will be incorporated into the scenarios to reflect feedback received from stakeholders in July/August
- Brattle will present the preliminary findings for each of the five scenarios (and change cases) at the October NERSC meeting

July 24

- Stakeholder brainstorming of plausible scenarios

Sept 21 (webinar)

- Detailed assumptions of the modelling shared with stakeholders

Aug 16

- Refined scenarios presented to stakeholders

Oct 15

- Brattle to present preliminary results of the modelling



Stakeholders' Input and Feedback

Input on Scenario Narratives

1. Low Net Demand: After market renewal, markets meet demand while customer costs and the Global Adjustment fall as contracts roll off. In the absence of a carbon price or clean attribute market, carbon emissions may increase as contracts expire

- Consider change case with higher amount of resources under contracts
- Consider change case with lower than \$3.50/GJ of gas delivered to Ontario

2. Low Cost Clean Grid Driving Growth and Exports: Low-cost clean technology and storage, stimulated by a strong carbon price, create opportunities to export energy, attributes, and capacity

- Consider applying a carbon price consistent NYISO's proposed carbon adder

3. Booming Economy & Electrification: A strong economy and electrification drive increased load and incremental supply; Load is increasingly controllable by the IESO

4. Challenging Supply Conditions: High load growth and retirement of a portion of nuclear supply creates a need for significant additional supply, while high technology costs (exacerbated by a high level of regulatory risk) test markets' ability to incentivize investments

5. Decentralized Future: Customer and prosumer value is created by integrating demand-side resources with wholesale markets, spurring significant activity in the DER space. This scenario will involve DERs actively participating in wholesale markets. A change cases will explore the outcomes where DERs defect from the grid (not visible or controllable by IESO), rather than participate in markets

- Will simulate BTM DER participating in wholesale market in this scenario, and a grid-defection change case where DERs are not controllable

Stakeholders' Input and Feedback

Revised Scenario Modelling Assumptions

	1. Low Net Demand	2. Low Cost Clean Grid Driving Growth and Exports	3. Booming Economy & Electrification	4. Challenging Supply Conditions	5. Decentralized Future
Ontario Net Demand	No net load growth (130 TWh, 23 GW peak, shape/location informed by Outlook A)	Moderate net load growth (150 TWh, 25 GW peak, informed by Outlook B)	High net load growth (175 TWh, 29 GW peak, informed by Outlook C)	High net load growth (175 TWh, 29 GW peak, informed by Outlook C)	No gross load growth, net load decreases (110 TWh, 19 GW peak)
Fuel Prices	\$3.50/GJ (Indicative of Current Dawn Hub prices)	\$3.50/GJ (Indicative of Current Dawn Hub prices)	\$6.00/GJ (Indicative of 2015 Dawn Hub prices)	\$8.00/GJ (Indicative of 2014 Dawn Hub prices)	\$3.50/GJ (Indicative of current Dawn Hub prices)
Carbon Prices	None	Consistent with NYISO Proposed Carbon Adder (\$60/tonne)	Consistent with modest WCI price (\$20/tonne)	Consistent with modest WCI price (\$20/tonne)	Consistent with modest WCI price (\$20/tonne)
Markets to Evaluate	MRP Only	MRP + Clean Attribute Market + Enhanced A/S	MRP + Controllable Load Markets + Enhanced A/S	MRP + Enhanced A/S	MRP + Clean Attribute + Customer Participation in Wholesale Markets
Non-Emitting Resources	Cost reductions relative to current levels, PV-Utility: 15%, PV-Rooftop: 30%; Wind: 2%; Storage: 25%	Cost reductions relative to current levels, PV-Utility: 20%; PV-Rooftop: 45%; Wind: 10%; Storage: 40%	Cost reductions relative to current levels, PV-Utility: 15%, PV-Rooftop: 30%; Wind: 2%; Storage: 25%	Costs of PV, wind, and storage consistent with current levels	Cost reductions relative to current levels, PV-Utility: 15%, PV-Rooftop: 30%; Wind: 2%; Storage: 25%
Status of Existing Resources	60% of Current Fleet remains under Contract or Regulated (20% nuclear, 5% gas, 35% non-emitting)	40% of Current Fleet under Contract or Regulated (20% nuclear, 3% gas, 17% non-emitting)	60% of Current Fleet under Contract or Regulated (20% nuclear, 5% gas, 35% non-emitting)	50% of Current Fleet still contracted/regulated; 2,000 MW nuclear supply retired	40% of Current Fleet under Contract or Regulated (20% nuclear, 3% gas, 17% non-emitting)
Additional Notes			Electrification loads more controllable by IESO		DERs participate in wholesale markets similar to wholesale supply

Note: All costs reported in \$2018 CAD. Pickering is assumed to be retired in all scenarios.

Potential Change Cases to Evaluate

We propose to evaluate several change cases to explore issues raised by stakeholders. These change cases will be evaluated after base cases for the scenarios are complete.

Potential Change Case	Changed Assumption in Change Case	Key Questions	Applies to Scenario
Stagnation of Market Development	Market remains approximately 100% regulated or under contract	Will any incremental investment be needed? How high will energy and capacity prices reach? What will be the impact on GA?	Low Net Demand
Lower Carbon Price in Low Cost Clean Grid Scenario	Carbon price reduced from \$60 (consistent with NYISO adder) to \$20/tonne (consistent with WCI)	Will investment in clean resources decline and carbon emissions increase? Will revenues shift from energy to environmental attributes market?	Low Cost Clean Grid Driving Growth and Exports
Lower Gas Price	Gas price reduced to \$3.00/GJ, consistent with 2016-17	Will utilization of and investment in gas generation increase?	Low Net Demand
DERs Do Not Actively Participate in Wholesale Market	DER investment is exogenous, rather than driven by wholesale energy and capacity payments	Will DER facilities that are not well aligned to system needs and trigger more price volatility?	Decentralized Future

SPP PRESENTATION



MISO PRESENTATION



Wrap-up

- Thanks for your participation
- We continue to encourage participants to attend stakeholder sessions
- Next MRWG meeting is October 17
- Any final comments or questions? Agenda items for next meeting?