Market Transition
Industry Stakeholder Session

July 10, 2018

Time	Agenda Item	Presenter
1:00 pm – 1:10 pm	Welcome, housekeeping, review of session agenda	Miranda Keating Erickson
1:10 pm – 2:10 pm	Part One: CMD Final Highlights	Kevin Dawson Nicole LeBlanc Cheryl Terry
2:10 pm – 2:40 pm	Q & A Panel – CMD Final (using Pigeonhole)	
2:40 pm – 2:55 pm	Break	
2:45 pm – 3:45 pm	Part Two: Upcoming Stakeholder Engagement	
	Overview	Kevin Dawson
	Provisional Rules	Kevin Dawson
	Demand Curve	Nicole LeBlanc
	Cost Allocation Tariff Design	Doyle Sullivan
	Market Roadmap	Kevin Dawson
3:45 pm – 4:15 pm	**Q & A Panel – Upcoming Stakeholder Engagement (using Pigeonhole)**	

Introduction

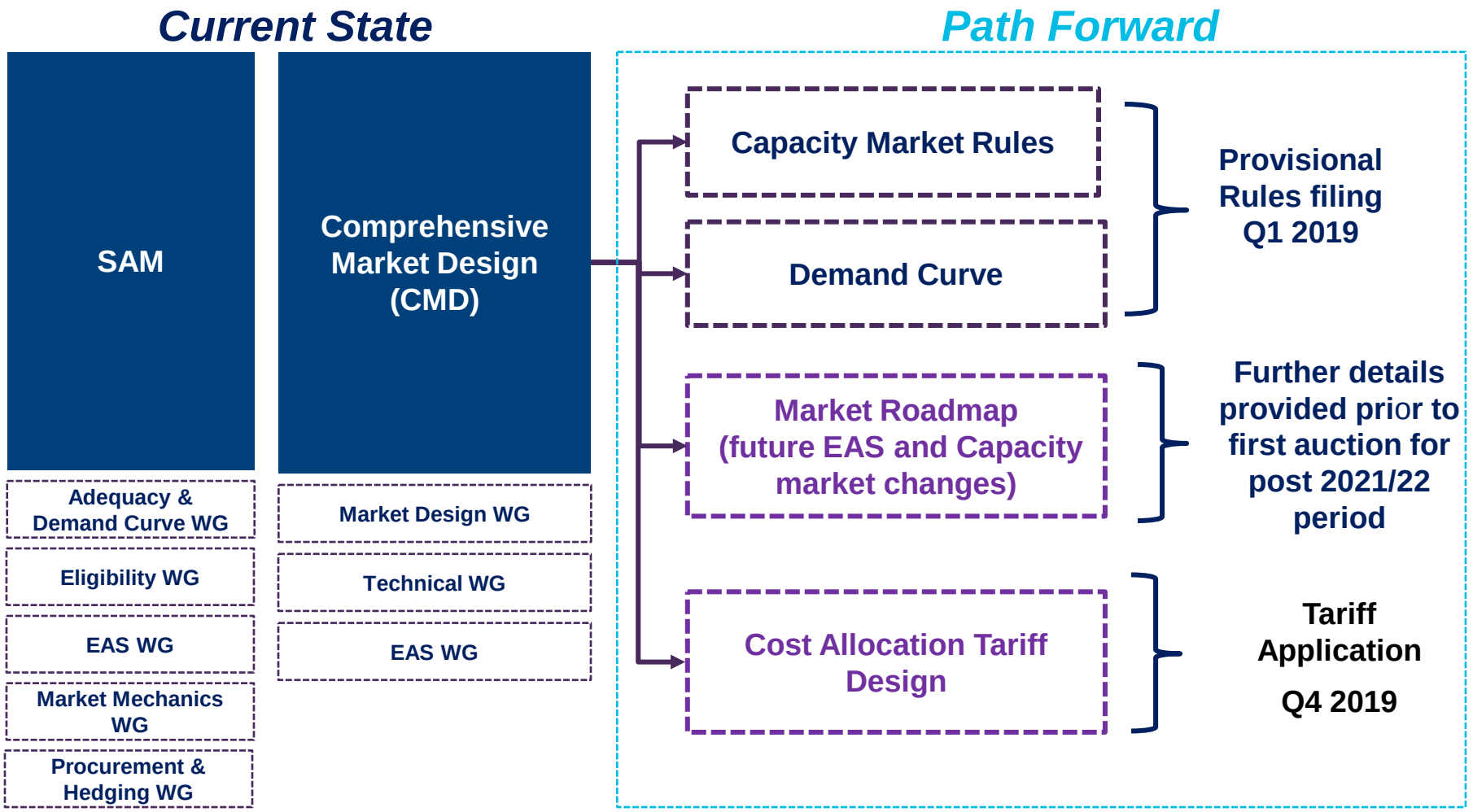
Miranda Keating Erickson

Vice-President, Markets

Session Objectives

DESIGNING THE MARKET	Highlights of the final Comprehensive Market Design (CMD)
LOOKING FORWARD	Overview of Market Transition Engagement – near term view

Path Forward



Current State:
CMD Final Highlights & Desired End State

Presented by:
Kevin Dawson, Director of Market Design,
Nicole Leblanc, Director of Forecasting,
Cheryl Terry, Principal Economist & Director, Corporate Economics

Desired End State

The AESO is confident that the design presented will achieve the desired end state for Alberta's capacity market:

"The desired end state is a **stable** and **transparent capacity market** that relies on **competitive market forces**, and works **efficiently with the energy and ancillary service** markets, to achieve **sufficient investment** to maintain **supply adequacy** and **reliability** at the **lowest cost** for consumers, while **working effectively** within Alberta's unique electricity structure."

CMD Final Section 2: Supply Participation

Supply participation design decisions will lead to a fair, efficient and openly competitive market through enabling a wide variety of supply to compete and by providing transparent information to market participants.

HIGH LEVEL DESIGN CHOICES
• Minimum size = 1MW
• Existing generation assets automatically prequalified for first auction; new assets, including external and demand side, must prequalify
• Eligible assets include thermal, demand response, external, storage, hydro, variable and aggregated assets
• REP Rounds 1,2,3 winners not eligible to participate
• Energy efficiency not eligible in initial auctions
• Demand response participation only on supply side of market in initial auctions
• Self-supply is permitted if on the same site, at same point of interconnection to the system. Changes are only allowed every four years unless physical operation changes
• Sites with only net-metered onsite generation or which cannot physically flow gross volumes due to transmission limitations must self-supply
• Assets meeting a defined size increase or investment threshold will be considered refurbished. Refurbished assets for mitigated firms will have a one-time option to provide an unmitigated and mitigated offer to be utilized in a multi-stage clearing process.
• Physical bilateral transactions will not be permitted

CMD Final Section 2: Supply Participation cont'd

Supply participation design decisions will lead to a fair, efficient and openly competitive market through enabling a wide variety of supply to compete and by providing transparent information to market participants.

HIGH LEVEL DESIGN CHOICES
• Security requirements for new assets will be a fraction of gross-CONE. Refurbished and incremental security will be based on fixed rates
• Assets must delist before ceasing participation in the capacity, energy or ancillary service markets
• Delisting is either permanent (retirement) or temporary for physical or economic reasons
• The AESO may conduct a reliability review prior to finalizing its assessment of delisting requests
• Temporary economic delist bids must be cost based and are only allowed during second rebalancing auction
• An asset may not economically delist for more than two consecutive obligation periods
• Temporary physical delist requests must be submitted for assets physically unavailable for five or more months during the obligation period
• Temporarily delisted assets will be allowed to return to the energy market if the AESO determines a reliability need exists
• Permanent delist notifications may only be submitted for the base and first rebalancing auctions. No economic test will be conducted.

CMD Final Section 3: Calculation of Unforced Capacity (UCAP)

UCAP determination will be asset neutral and will reflect the asset's contribution to supply adequacy.

HIGH LEVEL DESIGN CHOICES
• A measure of an asset's capacity value (UCAP) will be calculated for each prequalified asset by the AESO
• Asset owners will be able to select a final UCAP for each asset within a range
• Five years of historical data will be utilized to calculate UCAP, using the asset's availability or output during the 250 tightest supply cushion hours each year
• Forced and planned derates and outages, distribution system constraints and transmission outages resulting in electrical disconnection will not be excluded from historical data
• An availability or capacity factor methodology will generally be used to calculate asset specific UCAPs subject to some technology specific exceptions
• Class averages, engineering estimates or jurisdictional reviews will be used for assets with insufficient historical operating data
• A UCAP refinement process will allow capacity market participants to submit a request to review the UCAP or UCAP range for select reasons prior to utilizing a formal dispute resolution process

CMD Final Section 4: Calculation of Demand Curve Parameters

The Demand Curve developed should ensure supply adequacy, incenting new investment when required, and managing costs and risks to customers.

HIGH LEVEL DESIGN CHOICES
• Meet the Governement of Alberta's stated resource adequacy standard
• A forward-looking probabilistic resource adequacy model will be used; outputs will be translated into required UCAP procurement values
• System UCAP requirements will be adjusted to account for self-supplied volumes and ineligible resources
• A comprehensive gross-CONE estimate will be completed by an independent consultant at regular intervals; annual interim adjustments will be made using cost indices
• The reference technology used for determining gross-CONE and net-CONE will be a natural gas-fired technology selected through detailed cost screening; specific technology still to be selected
• The energy and A/S offset for calculation of net-CONE will be determined on a forward-looking basis via a forward market methodology
• The demand curve will be downward-sloping and convex with: o price cap set at the maximum of either 1.75 net-CONE multiple or 0.5 gross-CONE multiple o the minimum quantity set at a value of capacity equivalent to meeting the minimum of 0.0011% of EUE o the inflection point set at 0.875 x net-CONE, at a quantity 7% above the minimum quantity o the foot set at 18% above the minimum quantity, at a price of zero.

CMD Final Section 5: Base Auction

A 3 year forward period with a 1 year term provides increased revenue certainty and an effective price signal, while managing costs to consumers and leaving risks with investors.

HIGH LEVEL DESIGN CHOICES
• Three-year forward period (after a transition period with shorter forward periods)
• One-year obligation period, running November 1 – October 31
• Annual obligations only (no seasonal capacity commitments)
• No adjustments for out-of-market payments for initial auction
• Uniform price, sealed bid, single round auction
• Alberta will clear as a single capacity region with one capacity price
• If capacity volumes are limited in clearing by transmission constraints, uplift payments will be paid to resources priced above the unconstrained price that are required to clear the market
• The capacity market clearing mechanism will maximize social surplus and minimize deadweight loss
• A process will be established to resolve disputes related to prequalification assessments, UCAP determination, delisting, self-supply determinations and market power mitigation

CMD Final Section 6: Rebalancing Auctions

Rebalancing auctions provide flexibility for all market participants as they near the obligation period.

HIGH LEVEL DESIGN CHOICES
• Two rebalancing auctions will be held at 18 and 3 months before the obligation period; during the transitionary period, one rebalancing auction will be held 3 months before the obligation period
• Rebalancing auctions will provide the opportunity for capacity suppliers to buy-back previously sold volumes or sell remaining uncommitted volumes
• Capacity suppliers who are required to buy-out in a rebalancing auction due to failure to meet development milestones or UCAP reductions will be priced above the price cap to ensure clearing
• Rebalancing auctions will clear using the same mechanics as the base auction
• The demand curve for the rebalancing auctions will have the same shape as the base auction, with updated procurement volumes

CMD Final Section 7: Capacity Market Monitoring and Mitigation

Our mitigation proposal will protect consumers from the exercise of market power, while ensuring the market can attract sufficient investment.

HIGH LEVEL DESIGN CHOICES
• A must-offer requirement will apply to all qualified capacity assets unless they are permanently or temporarily physically delisted
• The AESO will conduct an ex-ante market power screen prior to each base auction to identify firms subject to capacity market offer price mitigation. Offer mitigation will not be implemented for rebalancing auctions.
• The market power screen will utilize the demand curve to identify firms that have the ability to profitably increase the clearing price by withholding capacity. The screen will be based on a firm's capacity offer control of existing asset UCAP.
• Firms that fail the market power screen will be required to offer all existing capacity assets at or below the default offer price cap of 0.8 x net CONE
• Assets may be allowed to offer at higher prices subject to demonstrating net avoidable costs higher than the default offer cap

CMD Final Section 8: Supply Obligations and Performance Assessments

Asset performance assessment ensures that consumers receive the reliability benefit that they pay for, with performance measured each obligation period and greater value placed on performance when the system is at greatest reliability risk.

HIGH LEVEL DESIGN CHOICES
• Prior to the start of the obligation period, new capacity suppliers will be required to meet development milestones. Resources not meeting milestones will be required to buy-back in rebalancing auctions.
• During an obligation period, the AESO will assess performance of capacity committed assets on both an availability and a delivery basis
• Availability will be assessed during the 250 tightest supply cushion hours, as determined at the end of the obligation period
• The AESO will apply an unavailability payment adjustment to capacity suppliers with a negative availability volume throughout the obligation period. The availability payment adjustment will be based on 40% of the asset specific obligation price per MW.
• A capacity committed asset with positive availability volume throughout the obligation period will be eligible to receive an over-availability payment adjustment, to be wholly funded from the unavailability adjustments received from those assets with negative availability volumes

CMD Final Section 8: Supply Obligations and Performance Assessments cont'd

HIGH LEVEL DESIGN CHOICES
• Delivery will be assessed during EEA events (levels 1 through 3) using actual energy production or level of consumption with consideration for the provision of reserves
• The AESO will apply a non-delivery payment adjustment to capacity suppliers with a negative delivery volume. The delivery payment adjustment will be based on 60% of the asset specific obligation price per MW.
• A capacity committed asset with positive delivery volume will be eligible to receive a delivery payment adjustment, to be wholly funded from the non-delivery adjustments
• To limit exposure, monthly adjustments for non-delivery will be capped at 300% of monthly capacity revenue, and cumulative adjustments for annual unavailability and non-delivery will be capped at 130% of annual capacity revenue
• Exemptions and non-exemptions from performance measurement are aligned with the UCAP calculation methodology
• Over-availability and over-delivery payment adjustments will be capped at one times annual revenue
• A capacity supplier will have the option of ex-ante asset substitution or ex-post volume reallocation to avoid or decrease non-delivery payment adjustments

CMD Final Section 9: Settlement and Credit Requirements

Our approach to settlement and credit provides sufficient collateral for participants to cover risk, without being a barrier to entry.

HIGH LEVEL DESIGN CHOICES
• Payments will not be made to capacity suppliers prior to the start of the obligation period
• Capacity market statements will be issued monthly
• Capacity payment adjustments due to unavailability or non-delivery will be deducted from monthly capacity payments with balances carried over
• Residual funds remaining after all performance payment adjustments are made will be credited to load
• Costs of procuring capacity will be allocated to customers per the approved cost allocation methodology
• No net settlement instructions for capacity will be enabled
• Capacity assets looking to buy back in rebalancing auctions and new capacity assets will need to demonstrate sufficient credit and may have to provide security
• New assets that have not reached commercial operation before the settlement period will have payment for that period held until the end of the obligation year
• Financial security is not required for existing capacity assets provided the asset maintains an obligation for the following period

CMD Final Section 10: Roadmap for Changes in the Energy and Ancillary Services (EAS) Markets

The Capacity and EAS markets form a holistic market framework that addresses the missing money concern at reasonable cost to consumers.

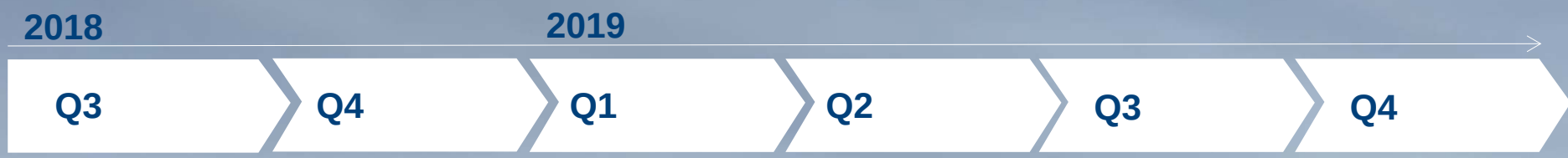
HIGH LEVEL DESIGN CHOICES
• Changes to the energy and ancillary services markets to align with capacity market obligations
• Mothball outage reporting rule will be replaced by delisting requirements
• A load asset or an import asset with a capacity commitment must offer in the energy market (similar to generation assets)
• Import assets will be provided the option of offering at a price other than $0
• Dispatch obligations include a requirement to submit a ramp table for enhanced dispatch certainty
• An ex-ante market power screen will be adopted in the energy market, based on an hourly residual supplier index (RSI) structural screen. The screen will not be conducted when the energy market is forecast to be in scarcity conditions (< 250 MW supply cushion).
• A firm that is identified by the market power screen will have its offers or bids mitigated to costs as calculated by a multiple of the asset-specific reference price (3x) or to opportunity cost for non-thermal assets
• A scarcity multiplier (6x) will be applied to reflect system conditions (when supply cushion is less than 1,000 MW and >= 250 MW)
• A number of other design changes will be considered as part of a market roadmap (not included as part of the capacity market implementation for 2021)

Part One: Audience Questions on CMD Final

Part Two:
Upcoming Stakeholder Engagement

Presenter:
Kevin Dawson, Director, Market Design

Market Transition Engagement Timeline



CAPACITY MARKET RULES

DEMAND CURVE

FILING Q1 2019

AUC DECISION

COST ALLOCATION TARIFF DESIGN

MARKET ROADMAP – stage 1 | stage 2

Overview of Market Transition Engagement

- Four engagement streams created for capacity market implementation
  - Capacity Market Rules
    - Drafting and consultation on the suite of ISO rules that will set out market participant and AESO obligations in respect of the capacity and EAS markets
  - Demand Curve
    - Continued workgroup engagement on development of the demand curve (finalize CONE study results and reference technology selection); stakeholder engagement on draft filing language for demand curve
  - Cost Allocation Tariff Design
    - Strike an advisory group and working groups to assist the AESO with the tariff design
  - Market Roadmap
    - Consultation on items identified for introduction into market structure subsequent to the initial delivery period (sometime beyond the 2021/22 obligation year)
    - Items include identified EAS evolution for dispatch certainty, shorter settlement, ramping product and pricing changes. Capacity market items include energy efficiency, out-of-market payments and demand side participation

Desired outcomes for Market Transition Engagements

- For stakeholders, Market Transition Engagements will provide adequate opportunities:
  - To understand how their interests will be impacted
  - To provide their feedback on key aspects of topics presented
- For the AESO, Market Transition Engagements will:
  - Help us gather key insights and information needed to make informed, robust decisions
  - Enable us to meet our AUC 17 requirements where applicable
  - Be fair, transparent and efficient

Engagement to develop ISO Capacity Market Rules (Provisional Rules)

Presenter:

Kevin Dawson, Director, Market Design

ISO Capacity Market Rules - Indicative Timeline

- Engagement on ISO Capacity Market Rules runs from July 26 to October 31
- Session in late July to gather remaining information needed to develop draft rules
- Draft rules will be presented in two sets
  - Set one (August)
  - Set two (September)

Capacity Market ISO rules

- As per Section 20 of the Electric Utilities Act, the AESO has the authority to make ISO rules . In addition, pursuant to Section 41.42 of the Electric Utilities Act, the ISO has the authority to make rules establishing the capacity market and for the operation of the capacity market.
  - ISO rules facilitate the safe, reliable and economic operation of the Alberta Interconnected Electric System and promote a fair, efficient and openly competitive wholesale market for electricity in Alberta
  - ISO rules govern market activity; they include requirements for participation in the electricity market. Examples of these requirements include:
    - Details of market operation and how participants submit offers, are dispatched, and receive payment
    - Includes operational standards (technical requirements)
  - *Electric Utilities Act* requires electricity market participants to comply with the ISO rules

Engagement Approach – Overview

- Engagement on Capacity Market ISO rules will be informed by the new requirements in Bill 13 (which is now law) and the new AUC rule 017
- In general, engagement on Capacity Market ISO rule language will be divided into 2 sets.
- Engagement for each set of ISO rules will:
  - include sessions (in-person and webinar)
  - feedback in writing
- Engagement for each set of ISO rules will include:
  - The AESO will use information session(s) (in-person and webinar) to present each draft rule
  - Sessions will explain purpose of rule, link to CMD final, other relevant aspects
    - There may be additional sessions and other engagement to work through the more complex subject matter in set 2 draft rules
  - 15 days written feedback period after each set of rules is provided
- Draft rules will be revised based on feedback from set one and two engagements
- Revised drafts of rules will be posted for a final round of written feedback in October
- Rules will be finalized in November and December, and filed in January

Process – ISO Capacity Market Rules

AESO will engage stakeholders to help develop and revise rules in two sets, based on CMD Final design decisions.

Set 1:

- Supply Participation (section 2)
- Base Auction (section 5)
- Rebalancing Auction (section 6)
- Settlement and Credit (section 9)
- EAS (part of section 10)

Set 2:

- Dispute Resolution (section 5)
- UCAP (section 3)
- Capacity Market Mitigation (section 7)
- Supply Participation – Delisting (section 2)
- Performance (section 8)
- EAS (part of section 10)

Outcome:

Develop approximately 18 new ISO rules

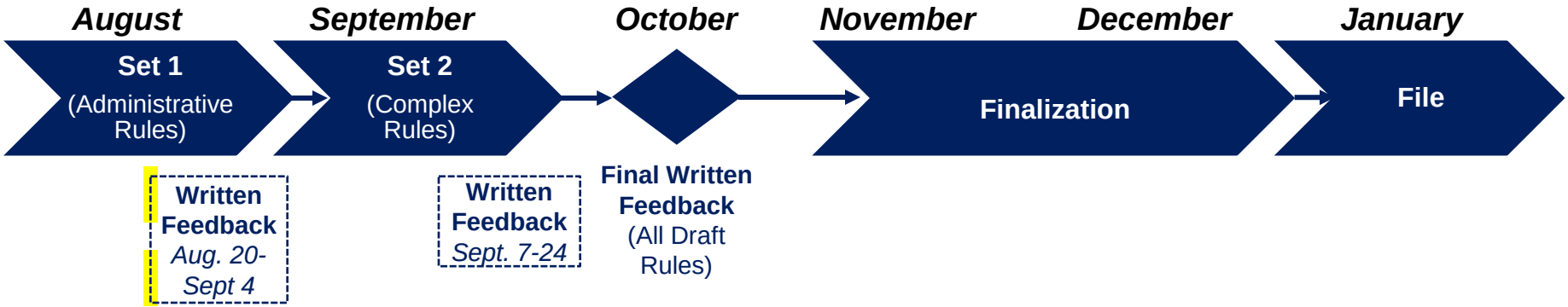
- 16 Capacity Market rules
- 2 new Energy market rules
  - Energy market monitoring and mitigation
  - Demand capacity asset outage reporting & coordination

Revise approximately 39 existing ISO rules

Indicative Timeline

Rule engagement will run July 26 – October 31

- Set 1 will have sessions between August 13 and 17
- Set 2 will have sessions between September 3 and 7
- Written feedback will be requested for each set of ISO rules
- Stakeholders will have 15 days to prepare their comments (i.e. August 20 - September 4 and September 7-24)
- Revised drafts of ISO rules will be posted for a final round of written feedback in October



Demand Curve Engagement

Presenter: Nicole Leblanc, Director
Forecasting and Analytics

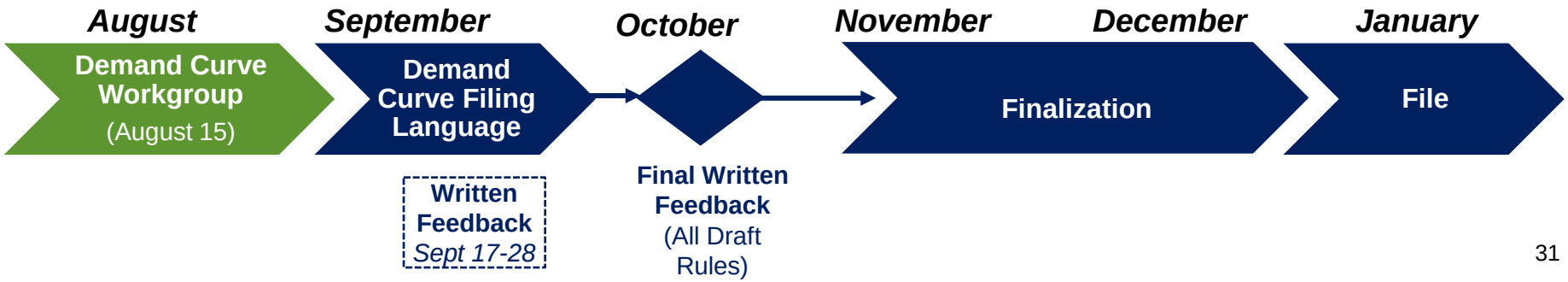
Scope of Engagement – Demand Curve

AESO will continue to engage with Demand Curve Workgroup to finalize the remaining demand curve components:

- Finalize gross-CONE estimate
- Reference technology selection
- Procurement volume (ICAP) for 2021-2022 and 2022-2023 obligation period

AESO will consult with stakeholders on the demand curve filing language in parallel with rule engagement

- There will be an opportunity to provide written feedback
- Revised draft will be posted for a final round of written feedback in October



Engagement to Develop Tariff Design for Cost Allocation

Presenter: Doyle Sullivan, Director Tariff Design

Cost Allocation Tariff Design – Background

- GoA determined that costs for procuring capacity would be allocated using a weighted energy method and recovered through the ISO tariff
  - Hours that contribute more to capacity costs should be weighted higher (i.e. these hours should be more costly) than hours that contribute less to capacity costs
  - Opportunity services will be investigated (however, legislation will be required to allow for this)
- Cost allocation engagement to be combined with transmission Bulk/Regional tariff engagement
  - The AESO recognizes that the cost allocation and bulk/regional tariff designs may have different timelines and may be advanced at different paces during the combined stakeholder engagement process

Engagement Format

- The AESO will be organizing an advisory group to develop recommendations for the cost allocation and transmission tariff design
- Advisory group details:
  - Membership
    - Self-select, respond to invitation (published in AESO newsletter and posted on aeso.ca)
    - Balanced membership from industry will be encouraged
    - Members to bring to advisory group discussions both their own perspectives and those of the stakeholder categories they belong to
  - Determine WG scope and membership
  - Initial meeting cycle every two weeks to develop
    - Initial scope of AESO-stakeholder examination of cost allocation and bulk/regional tariff design
    - Terms of reference for this engagement (i.e., objectives, principles, criteria governance)
    - Engagement schedule/milestones
  - Meetings will be facilitated
  - 12- 18 month engagement

Engagement Timeline

Kick-off sessions:

- Advisory group and WG selection
- Terms of Reference, Schedule, Scope development

Note:

Timeline for certain components may need to be advanced to support ISO Capacity Market Rules filing

Market Roadmap Engagement

Presenter: Kevin Dawson

Director, Market Design

Engagement Timeline

OCT 2018 – OCT 2019

Initial engagement – advancing priority items, details refinement

NOV 2019 and beyond

Continued development – rule development, monitoring

- Engagement on market roadmap items will encompass both energy and ancillary service markets components and capacity market components
- Different components will progress on different timelines depending upon prioritization
  - Not all will be resolved to draft rule stage in 2019
  - Some initiatives will be multi-year
- Details of timelines for each component still under development

Scope of Engagement

- Covers EAS and capacity market elements identified for evolution post 2021/22 obligation period
- Will include further refinement of timelines
- EAS elements
  - Prioritized development of evolved dispatch tolerance rules and related items
  - Developing further detail on design or trigger conditions to provide prior to initial auction on:
    - 15 minute settlement
    - Ramp product
    - Energy market pricing changes: offer cap, negative pricing, shortage pricing

Scope of Engagement cont'd

- Advancing development of previously identified capacity market elements
  - Prioritized development of participation of energy efficiency resources
  - Prioritized development of future treatment of out-of-market payments, particularly for asset volumes receiving support under REP
  - Further examination of demand side resource participation on the demand side of the capacity market
  - Refining timeline for introduction of any changes into market

Recap: Near Term Deliverables

Market Transition Engagement Milestones	Date
Industry session	July 10
CMD Final written feedback	July 20
Initial engagement on ISO rules	July 26 (afternoon)
Information session on modelling and data update	July 27 (morning)
Kick-off for Tariff design recommendations	August 1 - 10
Demand Curve Working Group session	Week of August 13 - 17
ISO rules set 1 session	Week of August 13 - 17
ISO rules set 2 session	Week of September 3 - 7

Market Transition Implementation Timeline

Stakeholder engagement

Policy engagement

Regulatory processes

2018

- CMD 1 January 26
- CMD 2 April 24
- CMD 3 June 6
- Final CMD June 29
- Bill 13 enacted Aug 1
- Draft market rules Q3-Q4
- Gross-CONE / Net-CONE estimation Q3
- Regulations Q4 published
- Rule 17 July 31

2019

- Demand Curve regulatory filing Q1 2019
- Rules filed Q1
- Regulatory proceeding Q1-Q2
- Implement IT system(s) for auction
- First auction process begins Q4 (November)

2020

- Implement IT systems for CM: settlement, clearance, performance
- Auction closes and initial obligations established

2021

- First delivery starting Q4

AESO

DOE

AUC

Panel Two: Audience Questions on Upcoming Stakeholder Engagement

Thank you