Bulk and Regional Tariff Design Stakeholder Engagement Session 5B (Demand Opportunity Service)

May 20, 2021

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  - Click “Lower Hand” to lower it if needed.
  - You can also ask questions by tapping the “Q&A” button and typing them in. You’re able to up-vote questions that have been already asked.
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Stakeholder participation

The participation of everyone here is critical to the engagement process. To ensure everyone has the opportunity to participate, we ask you to:

- Listen to understand others' perspectives
- Disagree respectfully
- Balance airtime fairly
- Keep an open mind

Welcome and Introductions

Session purpose and objectives

- The purpose of this session is to engage stakeholders in a discussion of the AESO's demand opportunity service (DOS) modernization recommendation to allow expanded eligibility (including energy storage). The session objectives include:
  - Present additional background on the AESO's demand opportunity service – what it is, the service it provides and how it operates today
  - Share our learnings on DOS modernization stakeholder feedback
  - Present and discuss the AESO's DOS modernization recommendation for the purpose of seeking stakeholder feedback on the recommendation

Agenda

Time	Agenda Item	Presenter
8:00 – 8:15	Welcome, introduction, purpose and session objectives including extension request on engagement and filing schedule	AESO / Stack'd
8:15 – 9:00	DOS 101 – describes how the current DOS rate works today • Origins of DOS • How the current DOS rate is derived • How DOS works ○ How to apply for it, use it, curtail it, how is it charged and what happens if you misuse it • Q&A	AESO
9:00 – 9:20	Recap of AESO conclusions on non-firm rates • Q&A	AESO
9:20 – 9:35	Break	
9:35 – 9:45	Key highlights of AESO's DOS modernization recommendation • Opportunity rate design principles • Proposed key changes to DOS	AESO
9:45 – 10:05	What we heard • DOS rate under preferred rate design • Fast recall rate • Annual term for DOS • DOS take-or-pay requirement • Provision of ancillary services as a DOS customer • Availability of capacity	AESO

Agenda

Time	Agenda Item	Presenter
10:05 – 11:30	AESO's DOS modernization recommendation • DOS Eligibility • DOS Connections • DOS Transactions • Suspension of DOS • DOS Rates Streamlined	AESO
11:30 – 12:00	Break	
12:00 – 12:50	Q&A Period • What we heard • AESO's DOS modernization recommendation	
12:50 – 1:00	Session close-out and next steps	AESO / Stack'd

Registrants (as of May 13, 2021)

- Alberta Direct Connect Consumers Association (ADC)
- Alberta Energy
- Alberta Newsprint Company (ANC)
- Alberta Utilities Commission (AUC)
- AltaLink Management Ltd.
- ASCENT Energy Partners Ltd.
- BECL and Associates Ltd.
- Best Consulting Solutions Inc.
- BluEarth Renewables
- Brubaker and Associates, Inc. on behalf of Alberta Direct Connect
- Canadian Renewable Energy Association (CanREA)
- Capital Power Inc.
- Chapman Ventures Inc.
- Chymko Consulting Inc. c/o Cities of Lethbridge and Red Deer
- Consumers Coalition of Alberta (CCA)
- Customized Energy Solutions
- DePal Consulting Limited
- Dow Chemical Canada ULC
- Enel North America
- Energy Storage Canada (ESC)
- ENMAX Corporation
- EnPowered Inc.
- EPCOR Distribution & Transmission Inc.
- EQUS
- ERCO Worldwide
- FortisAlberta Inc.
- Heartland Generation Ltd.
- Imperial Oil ExxonMobil Canada
- Industrial Power Consumers Association of Alberta (IPCAA)
- Kalina Distributed Power
- Lionstooth Energy Inc.
- Mercer Peace River Pulp
- Millar Western Forest Products Ltd.
- NextEra Insights Inc.
- NRGCS
- Power Advisory LLC
- RMP Energy Storage
- Suncor Energy Inc.
- TC Energy
- TransAlta Corporation
- Turning Point Generation
- Utilities Consumer Advocate (UCA)
- URICA Asset Optimization
- Voltus Energy Canada, Ltd.
- West Fraser Mills Ltd.
- Weyerhaeuser

Overview of Engagement Process

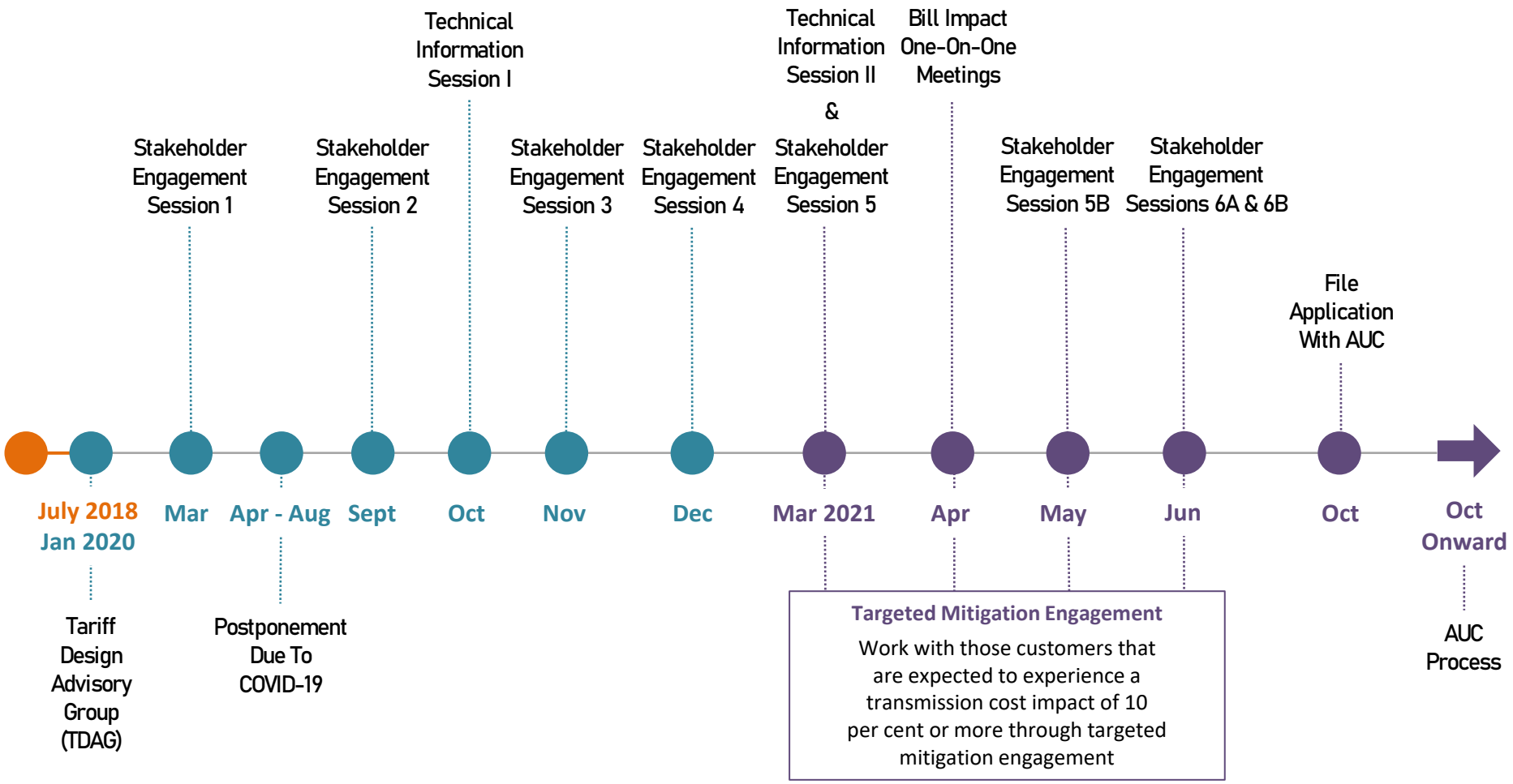
AESO Stakeholder Engagement Framework

Stakeholder engagement

The AESO's stakeholder engagement will:

- Ensure that stakeholders' needs and interests are consistently, transparently and meaningfully considered in the development of a rate design proposal for bulk and regional cost recovery;
- Provide clear objectives to be examined and evaluated in the development of a rate design proposal for bulk and regional cost recovery;
- Assist stakeholders in understanding and evaluating the AESO's preferred rate design;
- Supply stakeholders with tools that will allow them to consider and assess the impact of the AESO's preferred rate design; and
- Identify areas of alignment in order to support an efficient regulatory process.

Stakeholder engagement timeline



2018-19 2020 2021

DOS modernization

- The DOS rate has been a part of the tariff framework since de-regulation. However, the DOS rate has few users and would benefit from modernization
- This modernization effort looks to make improvements to the rate that:
  - Encourage greater opportunities for revenue maximization
  - Improve the operation and administration of this opportunity service

DOS 101 – Current DOS Rate Today

The origins of DOS (circa 2001)

- The original EAL* tariff application described opportunity service as
  - A short-term temporary service, provided on an as-available basis
  - Available to customers who could clearly demonstrate that their use of the transmission system would not be economically viable at the rates otherwise applicable
  - Used for short periods, in order to avoid the impact of contract demand or ratchet charges that would otherwise result
- The EAL stated
  - The objective of the opportunity service was to reduce the level of average rates charged to other customers by applying the extra revenue earned from the use of temporarily under-utilized transmission system assets
  - Pricing of the opportunity service should be on a value of-service rather than a cost basis
  - Criteria should be applied to prevent cannibalization of other revenues.

* ESBI Alberta Limited – the Transmission Administrator prior to the formation of the AESO

The origins of DOS (circa 2001) cont.

- The Energy & Utilities Board agreed and went further to state
  - Consistent and reliable application of qualification criteria is essential to the success of opportunity rates
  - To improve the chances of the accrual of benefits to other customers, effective screening criteria and regular audits are required

* ESBI Alberta Limited – the Transmission Administrator prior to the formation of the AESO

DOS 101

1. How the current DOS rate is derived (DOS pricing)
2. How DOS works
    i. How to apply for it (DOS Application Process)
    ii. How to use it (DOS transaction request process)
    iii. How to curtail it (DOS recall)
    iv. How is it charged (DOS settlement)
    v. What happens if you misuse it (DOS audit)

DOS 101 – How the current DOS rate is derived (DOS Pricing)

Derivation of the DOS pricing

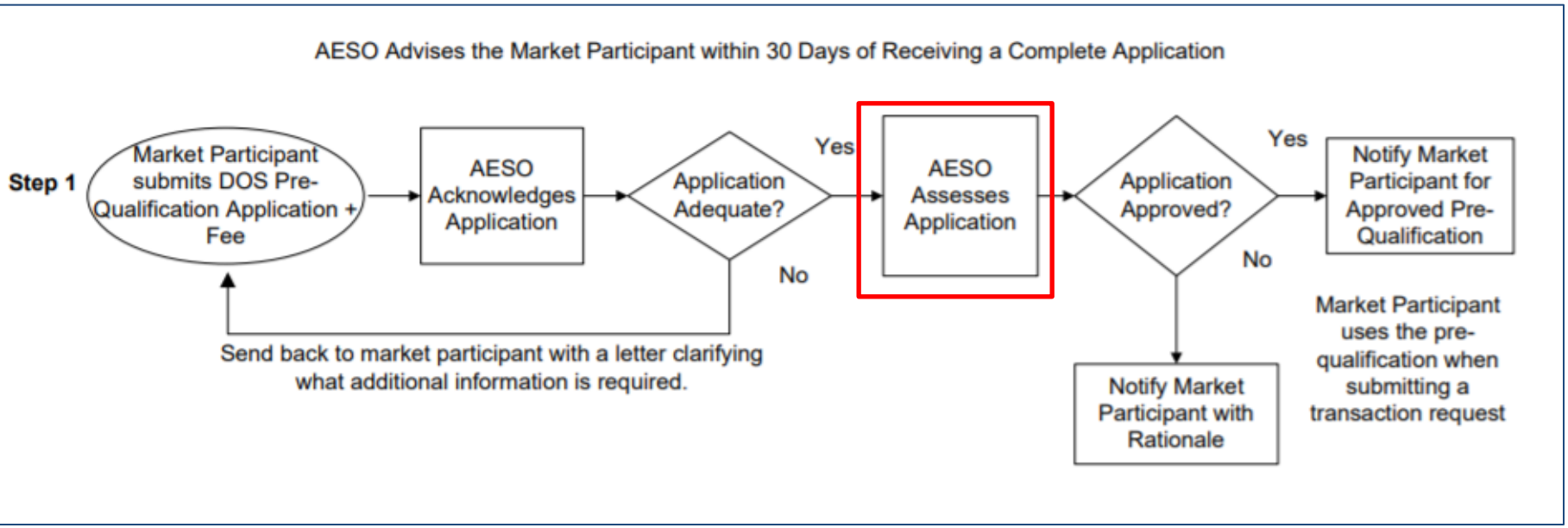
- Consistent with the original pricing principles the AESO's 2010 GTA stated
  - Rate DTS costs are first converted, by component, to $/MWh charges
  - The variable components of costs which are attributable to demand opportunity service — namely, the variable components of the bulk system and local system charges and the operating reserve charge are then allocated to the DOS rate
  - A contribution to transmission system fixed costs is added to each of the Rate DOS 1 Hour and Rate DOS Term services

DOS 101 – How to apply for it (DOS Application Process)

Annual DOS application

- Located in Appendix A of the ISO tariff
- Application requires:
  1. Start and end date
  2. Requested contract capacity
  3. Frequency of use
  4. MWh per month
  5. Technical information
     a) Load characteristic
     b) Anticipated load factor
     c) Power factor
  6. A case explaining that the use of this capacity is for a market opportunity and this energy consumption would not otherwise occur under Rate DTS

Current application process



Assess application from two perspectives

1) **Regulatory / Economic** – Does the application provide evidence that use of the service will not result in the reduction of other revenues?

2) **Reliability** – Can the system support this DOS load?
   - Assess power flows and voltage stability at peak load
   - If issues found may require further study

https://www.aeso.ca/assets/Uploads/DOS-Business-Practice-Document.pdf

Current eligibility requirements

A market participant must satisfy the AESO through a clear, thorough and convincing case, with supporting facts, that demonstrates that the proposed increase in demand:

1. Will be used on a temporary or repeated short term basis
   - The premise of this requirement is that if you are going to use the capacity on a long-term basis, then customers should contract for DTS
2. And, will
   - Replace an alternative source of energy where the market participant (i) has an available alternative source of energy, including means to employ it, that could be rationally used instead of electric energy from the AIES; and (ii) the cost of utilizing the alternative source of energy is less than the cost of receiving additional electric energy under Rate DTS; **or**
   - Take advantage of a market opportunity that requires additional electric energy where the cost of receiving additional electric energy under Rate DTS renders the opportunity uneconomic; and the market participant's alternative is to forego the opportunity

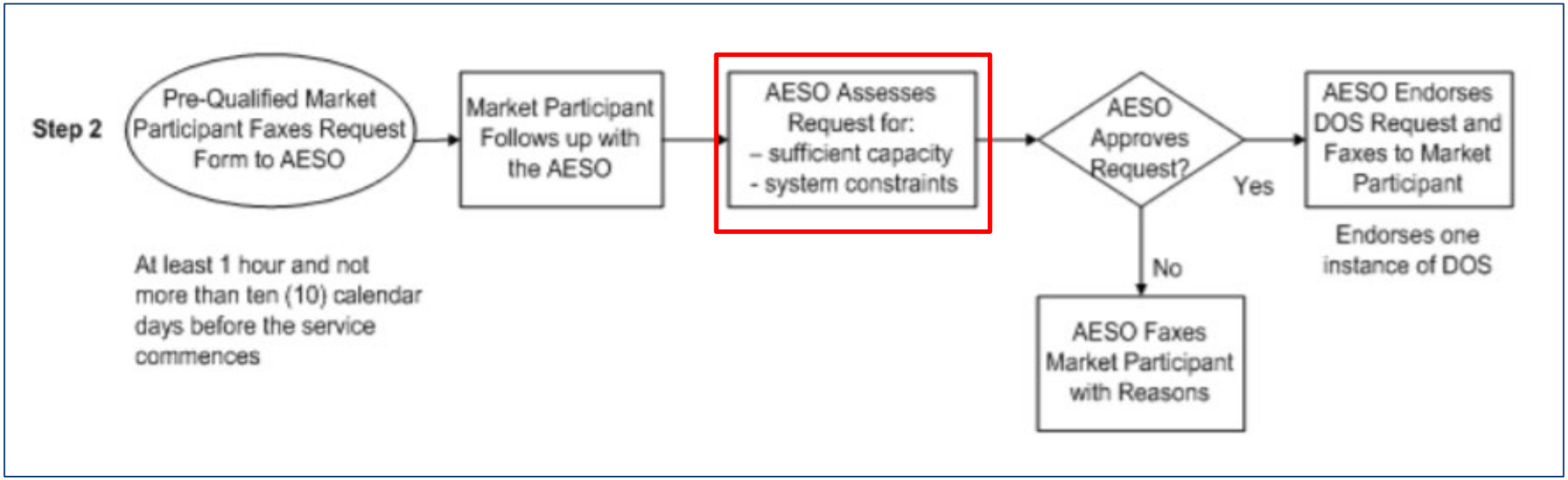
Ineligible reasons for using DOS

The use of DOS energy is not permitted if the request is to:

- Replace the energy provided by an on-site self-supplying generating unit on an unplanned outage or derate
- Be an alternative to the adoption of energy efficiency measures where the use of DOS could make the energy efficiency measures uneconomic

DOS 101 – How to use it (DOS Transaction Request Process)

Current DOS usage request process



Transaction request may be denied for two reasons:

1) **Erroneous request**
   - Incomplete form
   - No valid DOS contract
   - Volumes exceed contract capacity or MWh/month

2) **n-1 condition –** indicating insufficient capacity or constraints
   - Assessment performed upon receipt of the transaction request

DOS 101 – How to curtail it (DOS Recall)

DOS types and recall requirements

- The DOS rate type specifies the response requirement for recall

DOS type	Current rate	Recall requirement rationale
7 minute	$5.48/MWh	Seven minutes was chosen as a reasonable amount of time needed to remove the opportunity load off the electric system as quickly as possible but still allow time for the market participant to react to the instruction
1 hour	$18.14/MWh	Original consultations suggested there are customers that could be curtailed but needed more time to shut down processes
Term	$117.97/MWh	Seven minutes but would be recalled after 7 minutes and 1 hour DOS

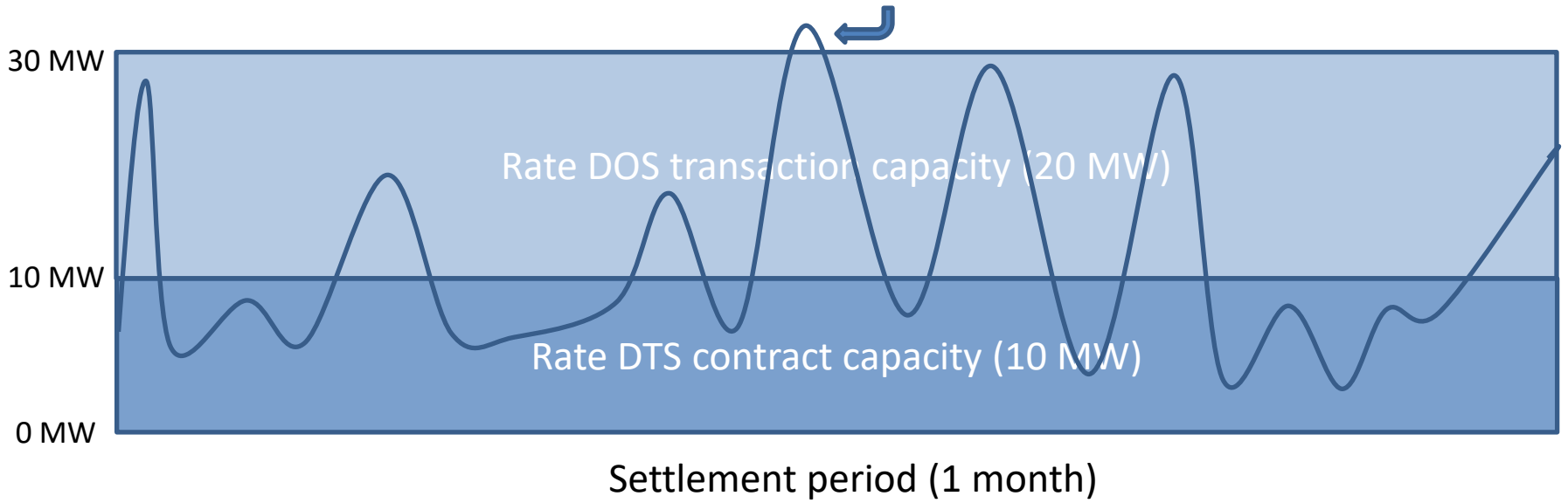
DOS energy recall

- DOS recalls occur for three primary reasons:
  1) Supply adequacy (Energy Emergency Alert (EEA) events)
  2) Real-time transmission constraint
  3) Voltage support
- Recall is issued to all DOS loads deemed effective in order of priority
- The system controller does not try to assess the duration of the contingency

DOS 101 – How is it charged (DOS Settlement)

Metered energy for DOS settlement

- DTS charges are applied to all metered energy at or below the DTS contract capacity
- DOS charges are applied to all metered energy above the DTS contract level and below the sum of the DTS and DOS contract capacities
- DTS charges are applied to any metered energy greater than the sum of the DTS and DOS contract capacities



Take-or-pay provision and losses

- The DOS settlement includes a take-or-pay provision for transaction requests
  - If a DOS customer submits a transaction request to use DOS energy in a month but does not actually use as much energy as indicated in the transaction request the customer may have to pay 75 per cent of the transaction request energy rather than pay for the actual energy consumed under DOS at the applicable DOS rate
  - The intent of this provision is to have the market participant submit realistic transaction requests
- DOS settlement includes the allocation of losses to the DOS energy consumed in the month
  - Each DOS load is assessed a loss factor

DOS 101 – What happens if you misuse it (DOS Audit)

Effect of disqualification

- The AESO may audit any market participant's circumstances to verify that the use of DOS complies with the ISO tariff and request additional information to:
  - Determine whether the use of DOS has ever failed to comply with the eligibility criteria
  - Identify any circumstances that would justify leniency or severity in applying any retroactive charges
- If the AESO finds that the market participant is no longer eligible for DOS, all metered energy delivered to the market participant will be billed under Rate DTS as of the effective date of the disqualification and the AESO will terminate billing under Rate DOS
- The AESO may recover retroactive amounts for the period during which such market participant did not qualify for, but was billed under, Rate DOS

Questions

Recap of AESO Conclusions on Non-Firm Rates

Forecasting and planning for load on Alberta's system

- Forecast load location and level, and generation location and dispatch are main inputs that are used to create scenarios for transmission system planning studies
  - Info provided in P1 – System Planning Report Transmission Tariff Work Group
- The AESO uses the following approach when planning for load on the system, be it low load factor, high load factor, standby with self-supply or price responsive/flexible:
  - Load forecasting methodology is a blend of top-down economic-based Alberta internal load (AIL) forecasts combined with bottom-up point-of-delivery (POD) level load shapes
  - Hourly gross load forecasts at each POD are the basis for load information used in planning the transmission system
  - Deterministic study conditions, developed based on expected stress conditions from anticipated combinations of load and generation output are analyzed
  - Characteristics of POD level load are captured in hourly forecast; individual POD level consumption in the study is dependent on its correlation with the study conditions (e.g., expected POD consumption during regional peak)

Related to AUC Questions 4.1 (g) & 6

Forecasting and planning for load on Alberta's system (cont.)

- Other considerations
  - AESO is leveraging existing forecast processes to account for energy storage, in alignment with its expected operation
  - DOS load is removed from POD level load data in study case if causing system issue
  - For local studies, the net flow of sites with self-supply may also be tested at the DTS contract level and a high outflow condition

Related to AUC Questions 4.1 (g) & 6

Session 4 feedback on energy storage tariff treatment

- What we heard
  - Current rates reflect one class of service: firm load
  - Consideration should be given to rates that reflect the different types of uses of the system: non-firm rates
  - Types of tariff treatment that could reflect different use of the system:
    - Rates that allow additional use of available capability that would not otherwise occur
    - Rates that reflect transmission cost savings from interruptions to relieve constraints
    - Rates that encourage participation in markets or provision of ancillary services

Summary of non-firm rate assessment

	Rates that reflect transmission cost savings from interruptions to relieve constraints	Rates that encourage participation in markets or provision of ancillary services	Rates that allow additional use of available capability that would not otherwise occur
Description	• Demand reduction (or increase) beneficial to reduce transmission constraints, value of which is reflected in rates	• Reduced DTS rate available everywhere to eligible loads / energy storage that participate in markets or reliability services (energy, OR)	• Discount relative to DTS for curtailable service to enable use of the system that would not otherwise occur to offset costs for other customers
Rationale	• Identify need in specific location • Interrupt load to manage transmission constraints • Lower future transmission costs	• Available everywhere • Encourage participation in market / service through additional bids and offers	• Encourage efficient use of capability without incurring additional transmission costs (AESO can recall and load must curtail)
Conclusions	• Rates that reflect transmission cost savings from interruptions to relieve constraints have a strong locational component	• Rates that encourage participation in markets or provision of ancillary services do not impose different transmission costs than those that do not, and provision of services is compensated through those markets / contracts	• Rates that allow additional use of available capability that would not otherwise occur are beneficial for all stakeholders provided the use of this capability would truly not otherwise occur under Rate DTS

Rates that allow additional use of available capability

- The AESO has considered options to reflect different use cases of the grid and has identified that energy storage could make use of transmission capability that would not otherwise occur for benefit of other customers or drive the need for additional transmission capacity
- DOS is one such rate
  - Allows customers connected to the grid to draw additional power over and above the amount they are contracted for under DTS as a means of reducing DTS charges for all customers
- Current treatment of DOS load
  - The AESO does not plan to build or modify transmission facilities for DOS customers beyond their DTS contract levels

Questions

Break

Key Highlights of AESO's DOS Modernization Recommendation

Opportunity service rate design principles

- Maintain original intent of the DOS rate while enabling greater use for revenue maximization and improve the operation and administration of the rate
- Ensure opportunity service rates result in use of transmission capacity that would normally not otherwise be used under Rate DTS
- Ensure the design
  - Applies the appropriate level of discretion in approvals
  - Does not disqualify existing DOS loads
  - Facilitates the timely review of applications given the potential increase in number of applications
  - Aligns with current AESO operations, planning, connections, and settlement processes

Proposed key changes

Current Rate DOS

- Technical Assessment
- Annual term and re-application
- Temporary or repeated short-term basis
- Business case or self-supply outage
- Recallable

Proposed Rate DOS

- Technical Assessment
- Business case or self-supply outage
- Maximum load factor
- Bidding and dispatch

What We Heard

DOS rate under the Bulk and Regional preferred rate design

Stakeholders commented that the DOS rate is too high especially with the preferred changes to cost allocation

- The DOS rate is estimated to change from ~$5/MWh to ~$13/MWh under the preferred rate design
- AESO's view is the DOS rate is still sound and redesigning the mechanics of the DOS rate is not part of recommendation
- Rate DOS is supportive of cost causation principles
  - Rate DTS reflects use of the system, and
  - Rate DOS reflects only the energy component costs in Rate DTS and not the demand components as transmission is not planned to meet the forecasted DOS load

Fast recall rate

Some stakeholders suggested the AESO consider developing fast recall product offered at a lower rate to the existing 7 min DOS

- Faster response capability is achieved with ancillary services
- DOS should not be considered an ancillary service
- The AESO procures required ancillary services competitively and does not obtain them indirectly through a transmission usage rate

Annual term for DOS

Proponents indicated that a one-year term for DOS is not long enough to make planning or investment decisions

- Current DOS term was intended to validate that the historical usage of DOS aligned with intention to use DOS capacity before granting the renewal
- Introducing dispatchable DOS removes the need for DOS to have a limited term
- With dispatchable DOS, a participant must actively manage their assets
  - Ex: customer has 10 MW DOS capacity to ensure compliance with ISO rules of dispatchable DOS capacity priced at the offer cap, and 20 MW of DTS capacity
  - To be compliant with DOS Terms and Conditions and energy market rules, the metered load at the site must be 30 MW when energy prices are below the offer cap
  - Conversely, if the price is at the price cap the DOS load must be curtailed by the bid amount

DOS take-or-pay requirement

Stakeholders question the continued need for a take-or-pay requirement

- The AESO is proposing to replace the transaction request with an energy market bid
  - To qualify for Rate DOS the AESO is proposing customers bid their DOS capacity into the energy merit order
  - Energy market dispatch compliance will prevent a Rate DOS participant from bidding for more DOS than will be used
- Dispatchable DOS bids effectively remove the need for the take-or-pay incentive
- Losses will continue to be assessed against DOS energy

Provision of ancillary services as a DOS customer

Some stakeholders requested the AESO clarify how DOS loads providing AS products would be managed

- DOS load would not be excluded from providing ancillary services
- By making DOS capacity dispatchable the AESO can use existing mechanisms for reserving capacity from ancillary service resources
  - For example, when a resource is dispatched for operating reserve that capacity is automatically removed from the energy merit order
  - During an EEA event load dispatched for operating reserve would not be curtailed until EEA2

Availability of capacity

Stakeholders suggested the AESO publish the location and availability of transmission capacity for DOS

- The AESO will not be prioritizing the development of this information as part of DOS modernization

AESO's DOS Modernization Recommendation

DOS Eligibility

DOS eligibility: Providing opportunity service while avoiding DTS cannibalization

- The AESO proposes to continue to require the provision of a business case to assess eligibility based on the eligibility criteria set out in the terms and conditions for the rate
- Eligibility assessment to include a combination of qualitative and quantitative measures:
  i. Technical Assessment
  ii. Business Case Assessment
  iii. Limited Use

Providing opportunity service while avoiding DTS cannibalization (cont.)

- Eligibility assessment to include a combination of qualitative and quantitative measures:
  - i. **Technical Assessment:** Continue to assess reliability impacts of taking DOS load at time of application
  - ii. **Business Case Assessment:** Continue to provide a business case explaining the need and use for DOS energy
    - Demonstrating that the energy would not be consumed if not for DOS
    - Indicating MW requested and maximum MWh/month or MWh/yr
  - iii. **Limited Use:** Create a quantitative measure of use of DOS that removes some of the subjectivity
    - Replace temporary or repeated short-term criteria
- This combination balances enabling DOS while discouraging the cannibalization of DTS for DOS

Technical assessment

- The technical assessment at time of application is done for reliability reasons and not to determine if and when DOS capacity would be available
- The AESO will continue to perform this assessment on any new or revised DOS application
- The AESO is proposing to make the DOS application part of the SASR process
  - The requirements specified within Alberta reliability standards (ARS) will drive the breadth of the study scope of a new or modified connection

Business case assessment

- The business case assessment will remain a qualitative assessment
- When reviewing the business case at the time of application the AESO will assess
  - Is the business case plausible?
  - Is there a convincing case that the customer would forgo the opportunity:
    - Under Rate DTS?
    - If DOS were not available?

Quantitative measure to replace temporary or repeated short-term use

- The AESO recommends replacing the temporary and short-term use requirement with a maximum load factor for DOS energy
- AESO identified three ways to guide an appropriate maximum usage level for DOS:

1. **Historical DOS usage**
   - Historical DOS usage as an indication of what future use should be
2. **Ratio of actual energy use compared to DTS capacity**
   - The unused capacity that exists because customers infrequently use all the capacity they pay for could be available for DOS
3. **Statistical assessment of system load use**
   - Infrequent use of the system occurs in the hours where load is one standard deviation above the average load

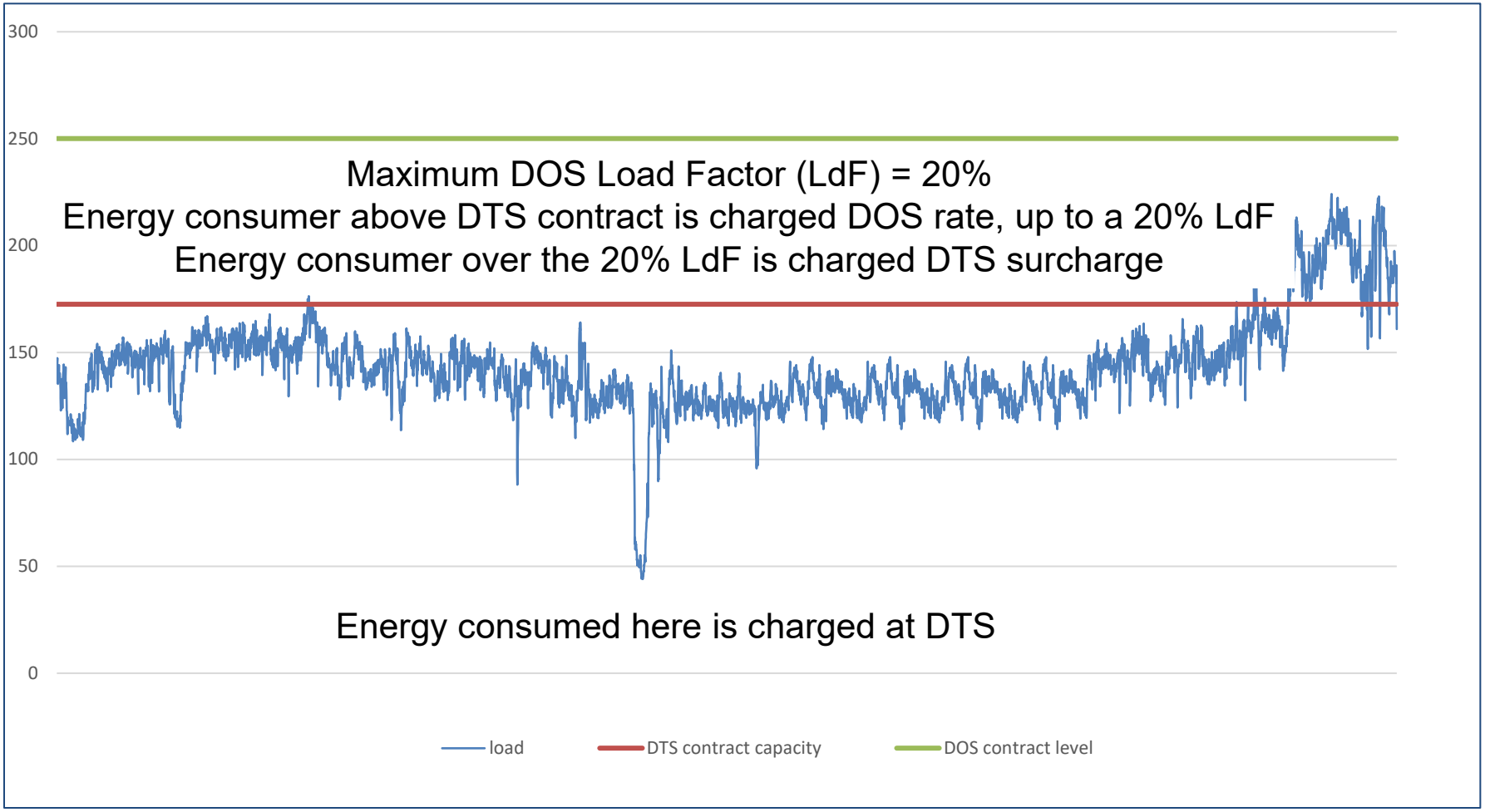
- Using these three guides the AESO proposes to develop a quantitative measure for this criteria

DOS maximum load factor

- Historical DOS utilization shows maximum load factors of 30 per cent monthly and 15 per cent annually
- Usage ratio of DTS energy consumed to DTS capacity (1 - ratio) indicates 23 per cent
- A statistical assessment of load - one standard deviation from the mean is 18 per cent (~~2017~~ 2007– 2019)

- **Given this guidance the AESO proposes a maximum annual load factor of 20 per cent for DOS load**

DOS maximum load factor – Example



* *DTS surcharge settlement is explained on the following slide*

Proposed modifications to DOS settlement given the new eligibility criteria

- Charges to DOS customer:
  - Energy consumed above the DTS contract levels will be charged at the DOS rate up to the maximum DOS load factor
  - Energy consumed above the maximum DOS load factor will be charged at DTS Surcharge rate
  - DTS Surcharge is equivalent to the current DOS Term rate in only as it relates to the $/MWh charge
    - DOS Term rates capture full DTS costs in a $/MWh form

AESO assessment summary

- **Technical assessment**
  - Taking DOS energy does not impact voltage and transient stability
- **Quantitative assessment**
  - Max load factor >= expected DOS load factor of customer
  - Max connection capacity >= DTS + DOS contract capacity
- **Qualitative assessment**
  - Is the business case for use of DOS plausible
  - Is there a convincing case that the customer would forgo the opportunity
    - Under rate DTS
    - If DOS were not available

Quantitative methods to replace temporary or repeated short-term use

- Temporary and short-term use requirement to be replaced with a more quantitative assessment
- Using the three guides the AESO proposes a quantitative measure for this criteria
  - **a maximum annual load factor of 20 per cent for DOS load**

DOS Connections

Applying for DOS

- The AESO proposes that the DOS application be included in a participant's SASR
- There are currently three processes for SASR:
  1. Connection Process applies to new connections
  2. Behind the Fence (BTF) Process applies to participant changes to existing facilities
  3. Contract Process applies to changes to SAS contract capacity
- The AESO proposes to modify the SASR and the SAS processes to include DOS requests

DOS for connections

- New connections
  - The AESO recommends the DOS capacity be assessed as part of gaining system access service or when participants change contract capacity
  - The pool participant will be provided a dispatchable sink asset with a maximum capability equal to the contracted DOS capacity for the purposes of energy market participation
  - The participant is responsible to manage the asset
  - Should the market participant wish to increase or reduce that capacity, those changes would be managed through the existing contract and asset management processes
- Existing connections
  - The AESO proposes to adapt the current SASR contract process to include DOS

DOS Transactions

Modernizing the operation of DOS

- The AESO is recommending to shift the operation requirement for the DOS rate from the tariff and into the energy market rules to rely on existing rules, procedures and practices
  - Export Opportunity Service and Import Opportunity Service have their real-time market operation defined within the energy market rules
  - The notification and recall requirements of the existing Rate DOS reflect capabilities of load market participants that existed over two decades ago
- Bid submissions would make DOS capacity continuously visible to system operators and more easily integrated into automated system studies and operation on a real-time basis
- AESO is proposing to include DOS loads as part of the energy market merit order with asset specific ramp rates

Suspension of DOS

Suspension of DOS

- Failure of an AESO audit
  - The AESO will retain the ability to audit a DOS customer
  - Examples of audit failure:
    - Use of DOS during a self-supply generator unplanned outage or derate
    - Consistently exceeding maximum annual load factor on DOS load
    - Exceeding combined DTS and DOS contract capacity
    - Operating in a manner that is clearly inconsistent with application business case
- Non-compliance to an AESO directive
  - Directives are made for safety or reliability reasons
  - Dispatch non-compliance would not necessarily result in suspension of DOS
    - Rule non-compliance is assessed by the AESO and referred to the MSA

Streamline of DOS Rates

One hour DOS is redundant

- The AESO is recommending removing the 1-hour DOS type
- 1-hour DOS has gone unused since 2004
- The proposed Dispatchable DOS design that dispatches load based on a participant submitted ramp rate removes the need for a rate-specific response time

Dispatchable term DOS

- Term type DOS is intended for sites looking to take planned outages of their self-supply generators and rely on the grid for back-up power supply
- The AESO proposes to keep the term DOS rate for this purpose but replace the current transaction request process with an energy market bid
- DOS energy cannot be used to serve load during unplanned generation outages or derates

Summary

Review | Summary of proposed changes

Measures	Remove	Add	Leave
Prevent DTS cannibalization from DOS	Annual term and fee, temporary or short-term usage	Load factor eligibility limit	DOS capacity terms, alt energy source or market opportunity (w/ business case), audit and disqualification
Assess available capacity for DOS	Monthly energy transaction request	DOS request in SASR, bidding requirement for DOS load (dispatchable DOS)	Reasons for DOS energy recall
Recallability of DOS	Monthly energy transaction request, 7 min and 1 hour and term DOS (combine to dispatchable DOS), Transaction fee	Recall in accordance with ISO rules (dispatchable DOS)	
Settlement of DOS	Take-or-pay requirement	DTS surcharge for exceeding load factor limit Operating reserves charged in same way as Rate DTS	Term Type DOS rate, Metered energy check, losses charged to DOS

Break

Question Period

What We Heard and AESO DOS Modernization Recommendation

Next Steps

Engagement schedule

- **March to June 2021 |** Targeted Mitigation Engagement – Continue to work with those customers that are expected to experience a transmission cost impact of 10 per cent or more
- **May 28, 2021 |** Stakeholder feedback due on questions set out in Stakeholder Comment Matrix Session 5B (DOS)
- **June 3, 2021 |** Host stakeholder engagement session to discuss Session 5 stakeholder feedback or follow-up and key questions raised by Commission staff, and to provide additional clarity and build mutual understanding of the AESO's preferred rate design and stakeholder concerns
- **June 24, 2021 |** Host stakeholder engagement session to discuss AESO's targeted mitigation discussion outcomes, Session 5B (DOS) and Session 6A stakeholder feedback, and areas of alignment
- **October 2021 |** File application with AUC for public proceeding and approval

Session feedback

- We want to thank you for attending the Bulk and Regional Tariff Design Stakeholder Engagement Session 5B (DOS) and we would appreciate your feedback on the session
- We invite all interested stakeholders to provide their input on this session via the questions set out in the **Stakeholder Comment Matrix Tariff Session 5B (DOS) on or before May 28, 2021**. The matrix will be available on May 13, 2021 on our website at www.aeso.ca.
  - Path: Stakeholder Engagement > Rules, standards and tariff consultations > Tariff (filter) > Bulk and Regional Tariff Design > Session 5B (DOS) | May 20, 2021

June sessions

- The next session (Session 6A) will be hosted on **June 3, 2021**. Registration details are now available on our website
- **Session 6A purpose**
  - The purpose of this session is to engage stakeholders in a discussion of Session 5 stakeholder feedback or follow-up and key questions raised by the Alberta Utilities Commission (AUC) staff, and to provide additional clarity and build mutual understanding of the AESO's preferred rate design and stakeholder concerns.
- **Session 6A objectives**
  - Share our learnings on Session 5 stakeholder feedback or follow-up
  - Present and seek stakeholder input on additional information on preferred rate design, including analysis of the potential response to the incentives provided in the rate design
  - Present responses to key questions raised by AUC staff
  - Seek to understand outstanding stakeholder concerns

June sessions cont.

- Following Session 6A, the AESO will host Session 6B on **June 24, 2021.** Registration details will be available at the end of May on our website
- **Session 6B purpose**
  - The purpose of the session is to engage stakeholders in a discussion of the AESO's targeted mitigation discussion outcomes, Session 5B (DOS) and Session 6A stakeholder feedback, and areas of alignment
- **Session 6B objectives**
  - Provide an overview and seek stakeholder input on the outcomes of the targeted mitigation engagement
  - Share our learnings and seek stakeholder input on Session 5B (DOS) and Session 6A stakeholder feedback and areas of alignment
  - Present and discuss implementation considerations
  - Seek to understand outstanding stakeholder concerns

Questions

Contact the AESO

- ***Twitter:*** *@theAESO*
- ***Email:*** *tariffdesign@aeso.ca*
- ***Website:*** *www.aeso.ca*
- Subscribe to our stakeholder newsletter

Thank you

Appendix 1 – DOS Usage Statistics and Comparison to Other Opportunity Service Rates

Historical DOS statistics

Number of transaction requests by type:

Type	# of Sites	# of transaction requests
DOS 7 minute	31 (2 sites currently)	2501
DOS 1 hour	11 (last used in 2004)	207
DOS term	22 (1 site currently)	66

Number of recalls by reason:

Year	Reason	# of DOS recalls
2006 - 2012	Supply Adequacy	32 EEA events
	Constraint and Voltage	70
2013 - 2021	Supply Adequacy	41 EEA events
	Constraint and Voltage	1

Export Opportunity Service (XOS) background

- Exports are charged greater of:
  a) $8.28/MWh x interchange transaction for the month + intertie loss charges, where

     intertie loss charges = sum of intertie loss factor x hourly interchange transaction MW x pool price

  b) A take or pay amount equal to the sum of $7.33/MWh x 75 per cent of scheduled capacity + the sum of 75 per cent of scheduled hourly capacity x pool price x intertie loss factor
- Like DOS the rate was derived from DTS
  - Rate DTS costs are first converted, by component, to $/MWh charges
  - The export opportunity rates are then allocated the variable components of costs which are caused by exports when they occur, as well as a contribution to fixed costs (20 per cent)

Appendix 2 – Load Factor Determination

Historical DOS use

- Historical DOS utilization shows maximum load factors of 30 per cent monthly and 15 per cent annually
  - Based on data from 2001 to 2020

Statistical assessment guide

The one-sided normal distribution of all DTS load in 2019 revealed:

	MW	# of Hours	% of Hours
Average	6,812.79	4231	48.3%
Average + 1 St Dev	7,432.16	7220	82.4%
Average + 2 St Dev	8,051.53	8631	98.5%
Average + 3 St Dev	8,670.90	8760	100.0%

- Per cent of the hours within one standard deviation for 2018 is 83.5 per cent and 2017 is 81.8 per cent
- The AESO surmises that load greater than one standard deviation is a reasonable measure of infrequent use acknowledging the use of DOS should be infrequent

Usage ratio guide

- System built to serve 100 per cent of in merit energy
- Load pays for that system
- Real-time utilization of the system is coordinated through dispatch of the market
- DOS is a tool for DTS customers to “sell” the unused capacity and the proceeds of the sale applied as a reduction to cost of DTS
- The ratio of DTS energy consumed to DTS capacity is another proxy for the level of energy use that is temporary or short-term
- Usage of DTS energy consumed to DTS capacity equals 23 per cent

Appendix 3 – Dispatch and Dispatch Compliance

Distinction between dispatchable and controllable

- Dispatchable Assets are:
  - All source assets 5 MW or greater
  - All sink assets participating in DOS (DOS capacity must be at least 5 MW)
  - Any sink assets 5 MW or greater that choose to be dispatchable
- Controllable assets are dispatchable assets that can comply with dispatch instructions within the allowable dispatch variances (i.e., +- 5 MW)
- When an asset request is made the AESO makes an assessment as to whether the asset is controllable or not. This decision is often tied to the underlying technology
- For example:
  - Wind and solar AGFs are considered dispatchable but not controllable and therefore have different dispatch compliance rules than generating units
  - Energy storage* and loads with onsite generation are considered controllable

* AESO is proposing an alternative dispatch compliance method for Energy Storage and VER Hybrids

Dispatchable DOS advantages

- Dispatchable DOS loads participate in the energy market by submitting a bid for the approved Rate DOS transaction capacity. Doing so accomplishes two things:
  1. It simplifies the DOS for real-time operations because the in merit bid volume indicates the amount of DOS load being served in real-time and provides a curtailment order based on bid price
  2. Bidding DOS load ensures the load under Rate DOS is truly curtailable, leveraging the existing ISO rule and compliance processes rather than build duplicative curtailment requirements within terms and conditions of the DOS rate
- Should DOS capacity become unavailable, or restricted, the system controller has the ability within the existing tools to “limit” the DOS consumption in accordance with congestion management protocols through mitigative measures such as directives or automated schemes
- Failure to comply to an ISO directive to curtail DOS could result in suspension of DOS participation and a recalculation of the DTS contract capacity, administrative penalties, and the recovery of DTS revenue charged while under DOS

Dispatchable load bidding

- Note, the AESO anticipates proposing recommended changes to the current ISO rules for bidding as described in division 203 – Energy Market of the ISO rules, through the Energy Storage Rule Amendments initiative. Stakeholders will be engaged in consultation on proposed amendments to the ISO rules at that time

Appendix 4 – Eligibility Options

DOS eligibility options evaluation

Accepted	Pro	Con
Maximum annual load Factor	Provides certainty; mitigates risk of excessive DTS cannibalization	Not an accurate measure of individual energy for market opportunity
Application business case	Able to characterize unique market opportunity for opportunity service	Evaluation somewhat subjective, uncertainty of acceptability
Eliminated	**Pro**	**Con**
Third party audit of market opportunity	Ability to evaluate unique market opportunities	Costly to user
Owner attestation	Places evaluation with customer who is best able to evaluate market opportunity	Structuring an effective attestation may be difficult
Post use audit	Able to evaluate with actual information on use of opportunity service	Uncertainty of outcome and cost for user
Timing limitations on DOS/DTS contract changes	Provides certainty on the opportunity nature of the energy use	Limits ability to take advantage of opportunity during time limitations; time limitation may be somewhat arbitrary
AUC approval	Authoritative	Uncertainty of outcome and cost for user

Appendix 5 – Acronyms

Acronyms

- AGF = Aggregated Generating Facilities
- AIES = Alberta Interconnected Electric System
- AIL = Alberta internal Load
- ARS = Alberta Reliability Standards
- AS = Ancillary Services
- AUC = Alberta Utilities Commission
- BTF = Behind The Fence
- CP = Coincident Peak
- DFO = Distribution Facility Owner
- DOS = Demand Opportunity Service
- DTS = Demand Transmission Service
- EAL = ESBI Alberta Limited (Transmission Administrator prior to the formation of the AESO)
- EEA = Energy Emergency Alert
- GTA = General Tariff Application
- IOS = Import Opportunity Service
- LdF = Load Factor
- MSA = Market Surveillance Administrator
- OR = Operating Reserve
- PILON = Payment in Lieu of Notice
- POD = Point-of-Delivery
- SASR = System Access Service Request
- VER = Variable Energy Resource
- XOS = Export Opportunity Service