

Dispatchable Renewables and Storage

Dennis Frehlich, P.Eng., Senior Strategic Advisor, AESO

April 10, 2018

2000-2017
Energy-only market

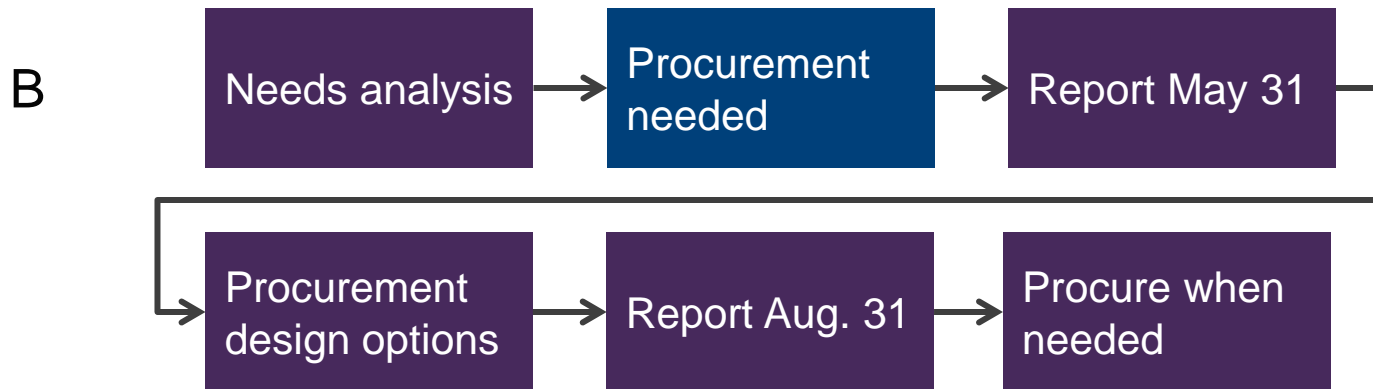
2017-2030
Transition

- Phase out coal emissions
- Implement Renewable Electricity Program (REP)
- Evolve energy market to include capacity market



Assess flexibility needs, dispatchable renewables & storage

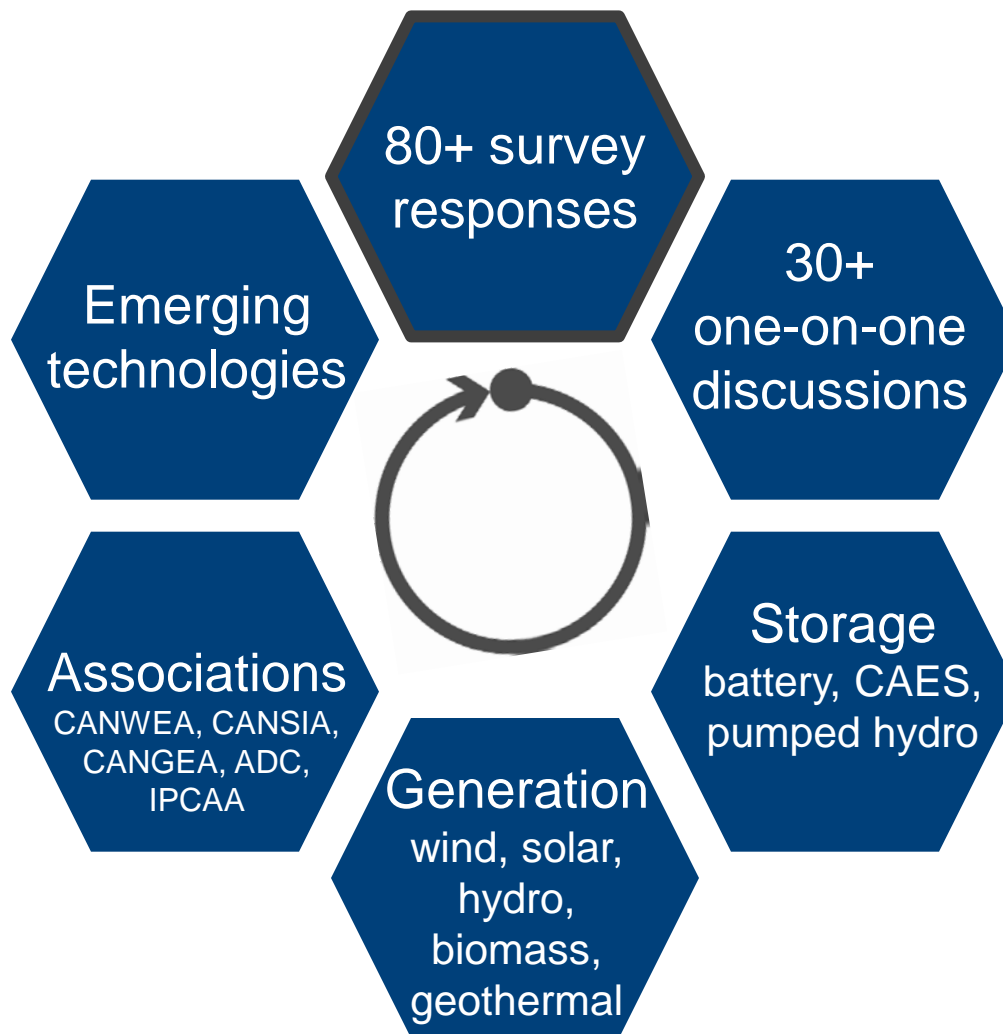
Plan to assess needs, and address, if required

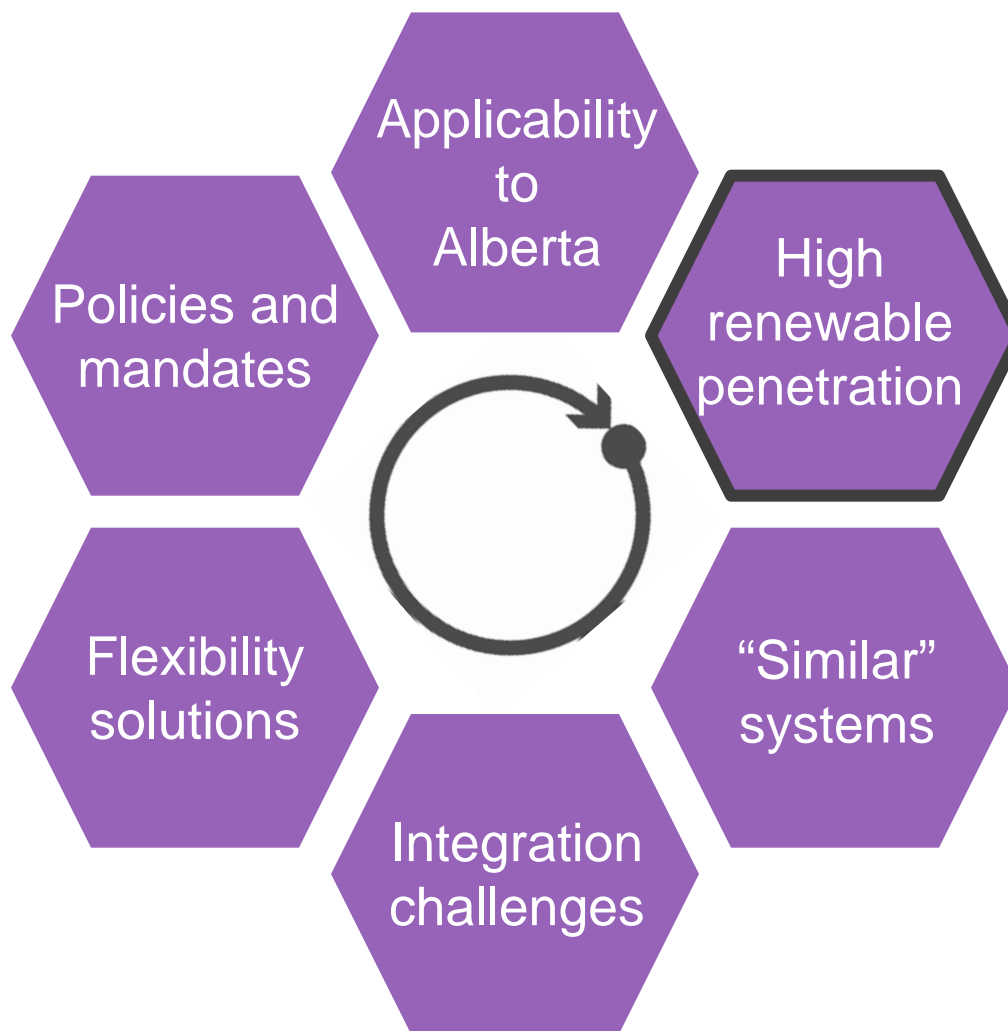


Key work streams

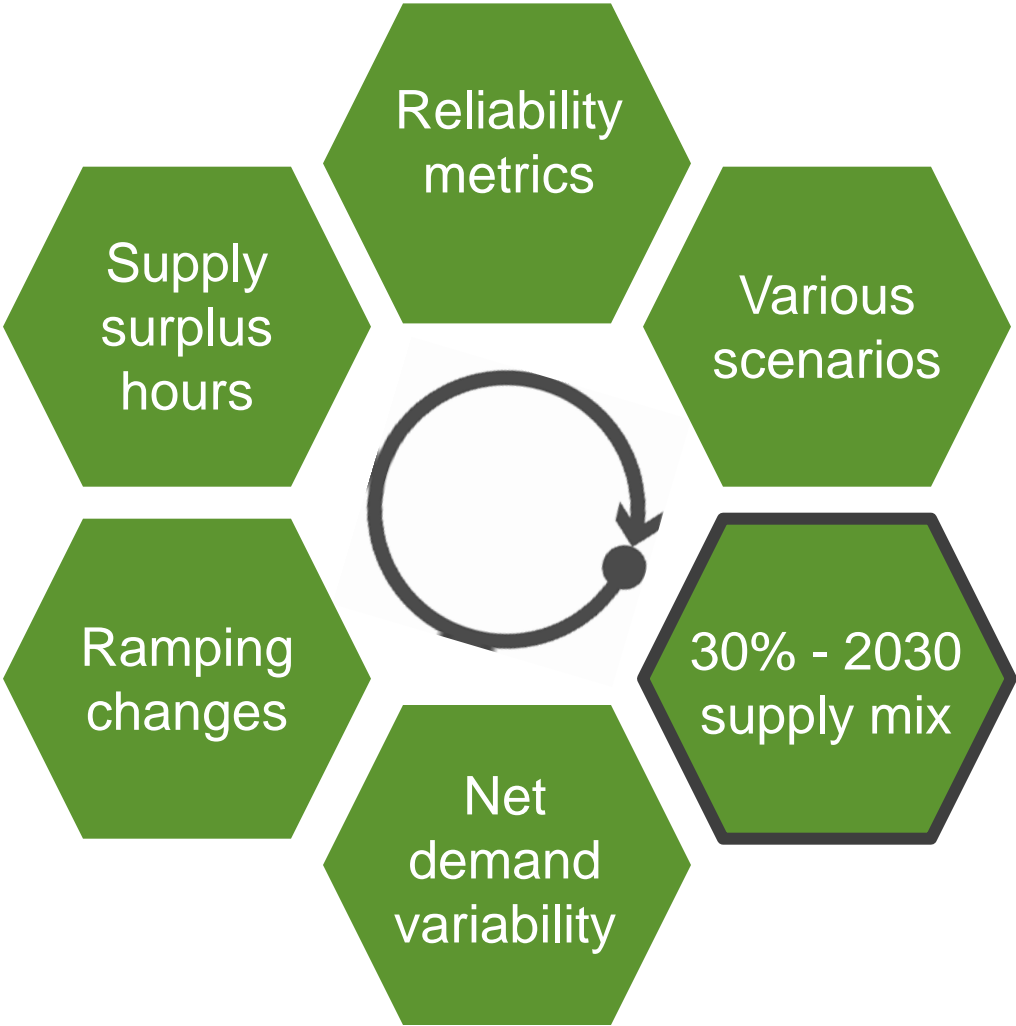


Stakeholder engagement

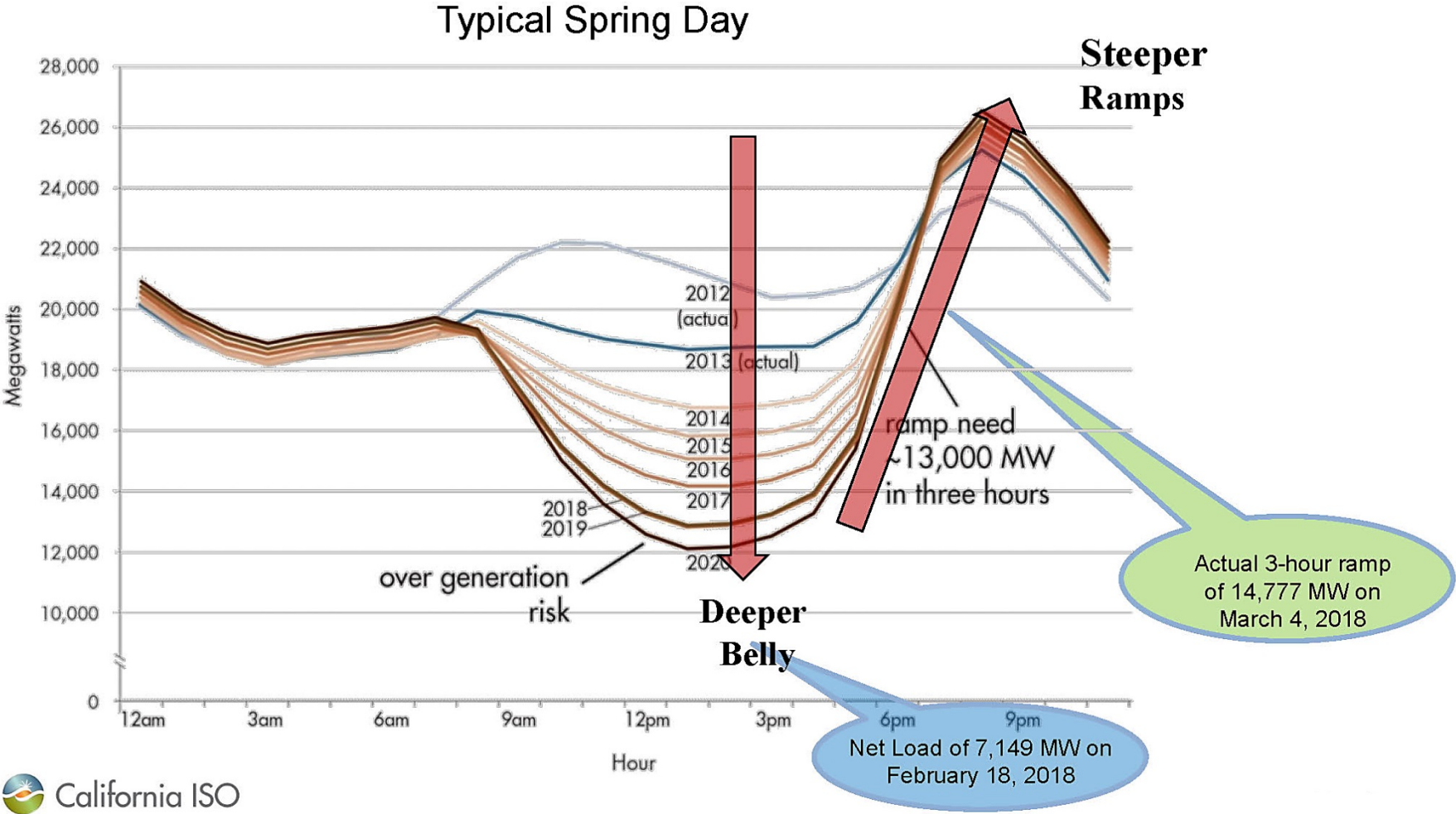




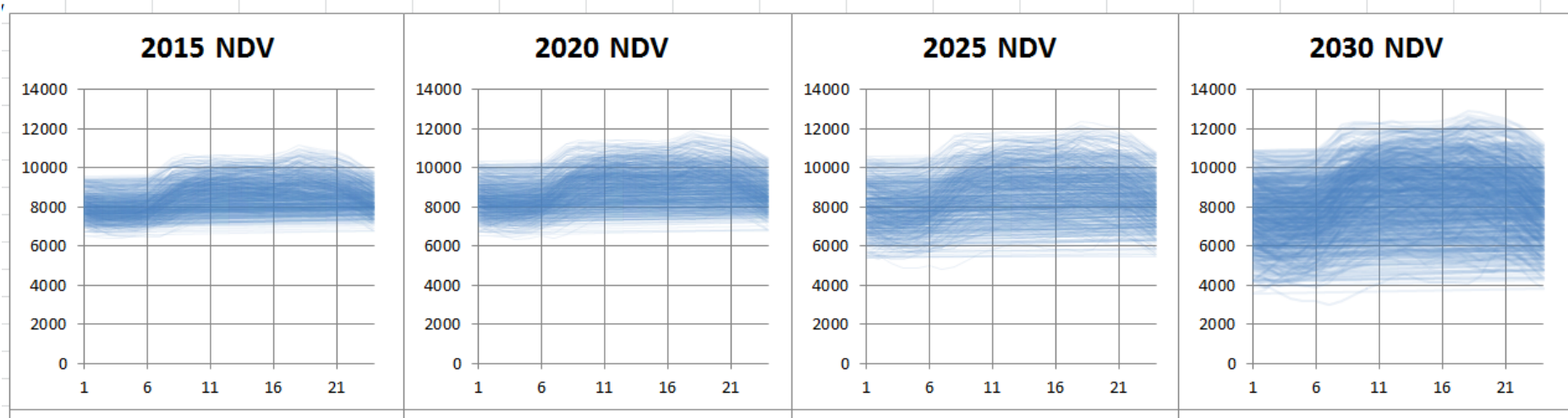
Flexibility needs assessment



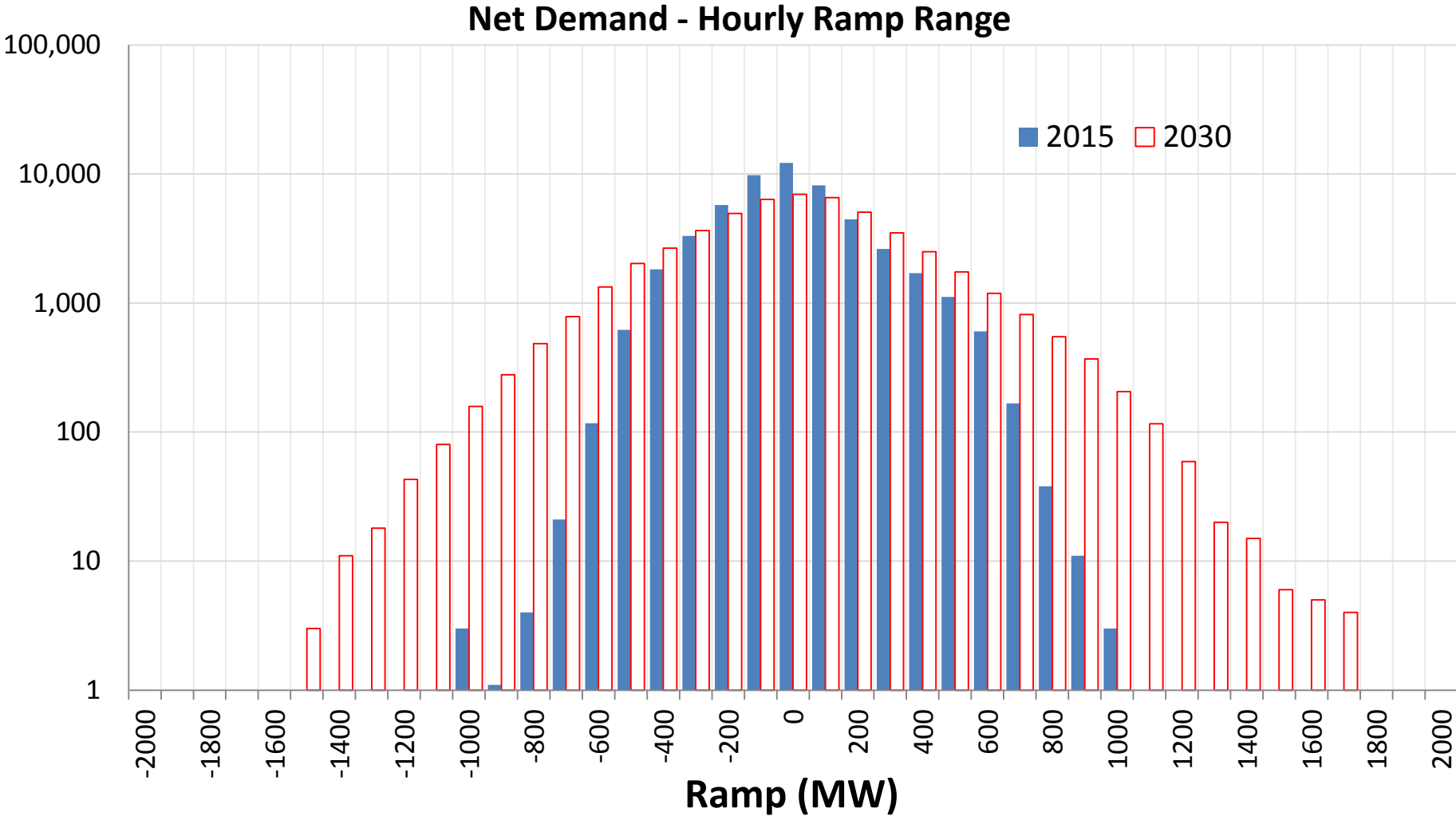
CAISO net demand: more predictable 'duck curve'



Alberta's net demand: 'spaghetti plot'



Managing growing ramps will be a focus



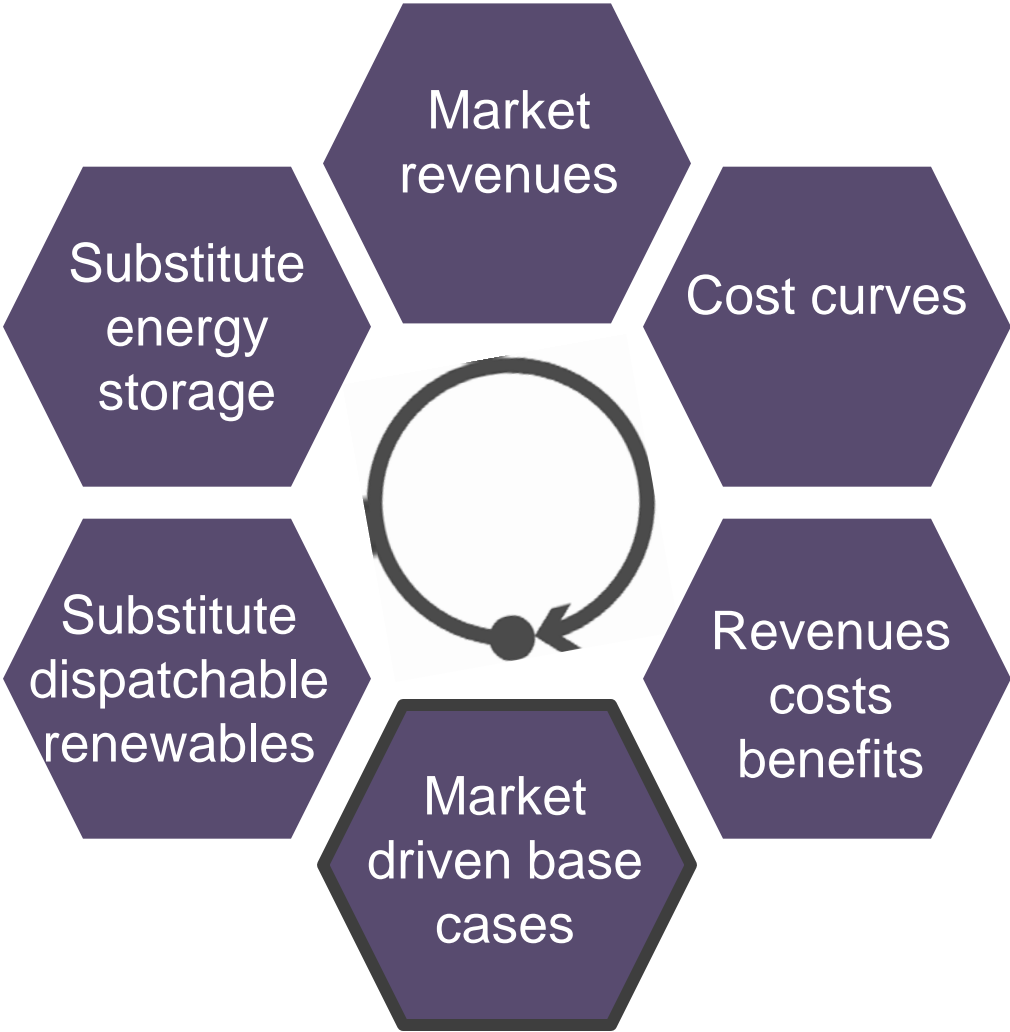
Supply surplus: maybe in 10 years and small

Excess Generation (MWh)

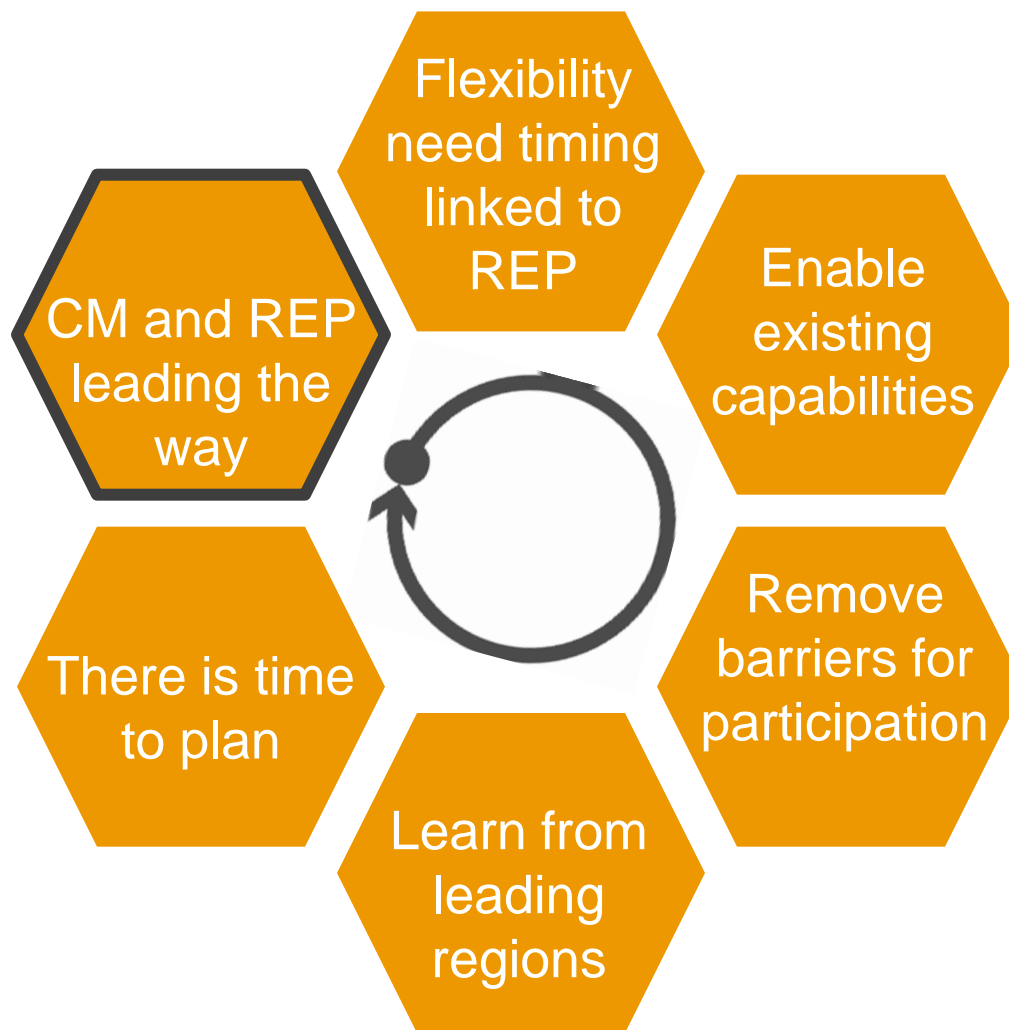
Distribution of Supply Surplus Energy (MWh) by Month, 2025-2030

Month	2025	2026	2027	2028	2029	2030
1	-	-	-	916	1,939	6,744
2	-	-	-	-	138	3,002
3	-	-	-	-	-	1,669
4	-	-	-	-	336	1,106
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	116
8	10	42	-	5,131	9,243	17,058
9	-	-	344	2,954	7,639	18,510
10	-	113	110	5,397	5,371	7,637
11	-	-	-	9	197	2,986
12	-	-	-	-	638	2,533
Total	10	155	454	14,407	25,501	61,361
% Wind	0.00%	0.00%	0.00%	0.09%	0.14%	0.32%
Wind MCR (MW)	4,245	4,645	5,045	5,545	6,045	6,445
	12,643,308	13,834,668	15,026,028	16,515,228	18,004,428	19,195,788

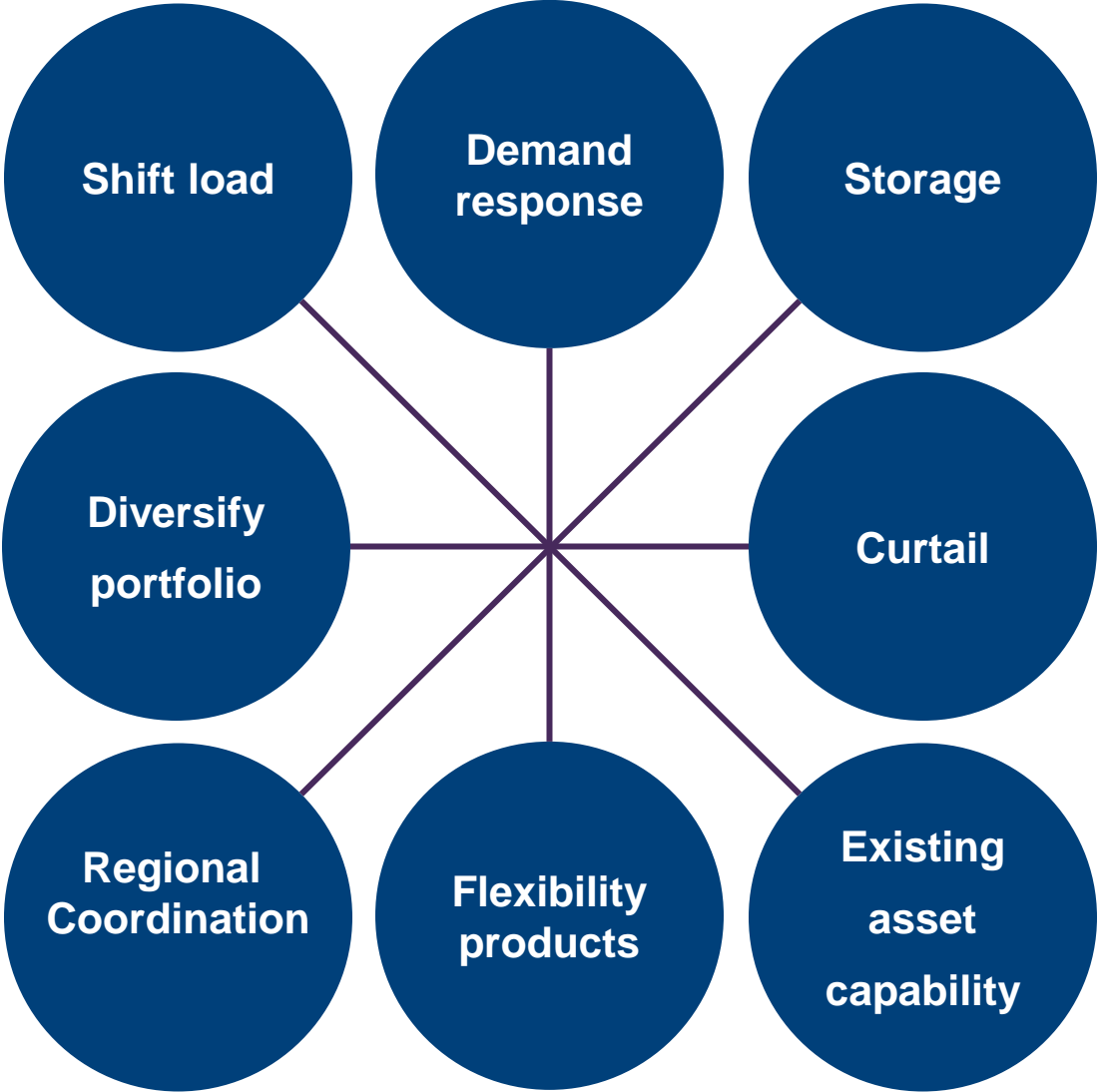
Benefit analysis



Coordination with capacity market and REP

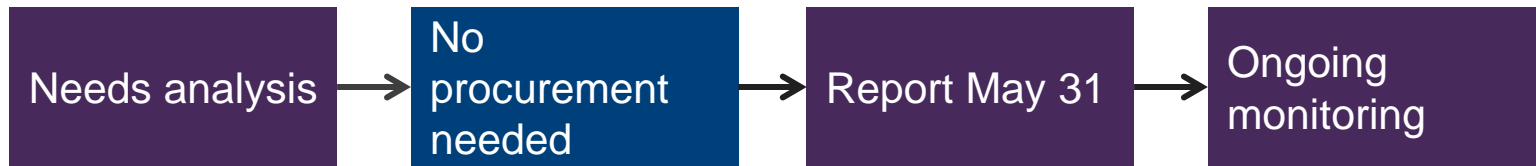


Flexibility options

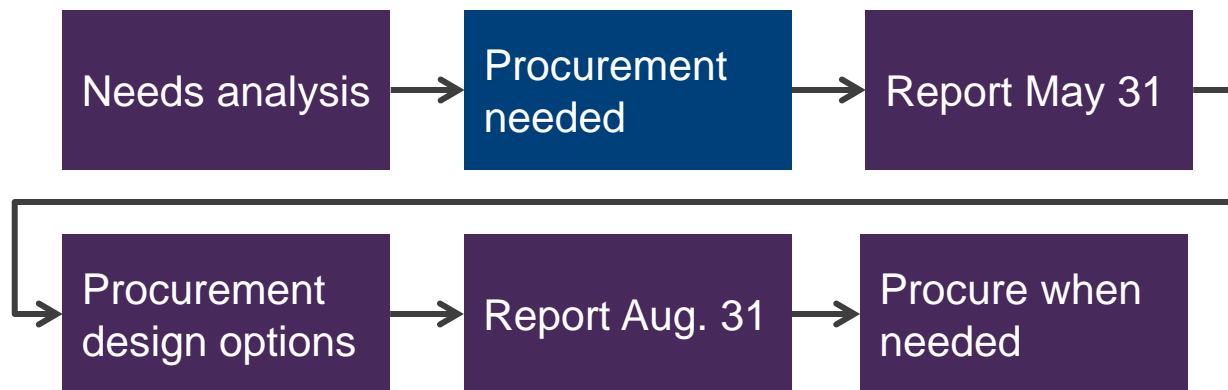


Plan to assess needs, and address, if required

A



B



Thank you

The information contained in this document is for information purposes only, and the AESO is not responsible for any errors or omissions. Further, the AESO makes no warranties or representations as to the accuracy, completeness or fitness for any particular purpose with respect to the information contained herein, whether express or implied. Consequently, any reliance placed on the information contained herein is at the reader's sole risk.