



Hybrid Resources Phase 2B Refresher Training

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These labels will let you know what has been changed for this refresher session.

**NEW
MATERIAL**

**UPDATED
MATERIAL**

This refresher is intended for:

NEW
MATERIAL

New Hybrid
Resources

Existing Hybrid
Resources

Storage and VER
Data Consumers

Housekeeping



Make sure to keep yourself muted unless you have a question

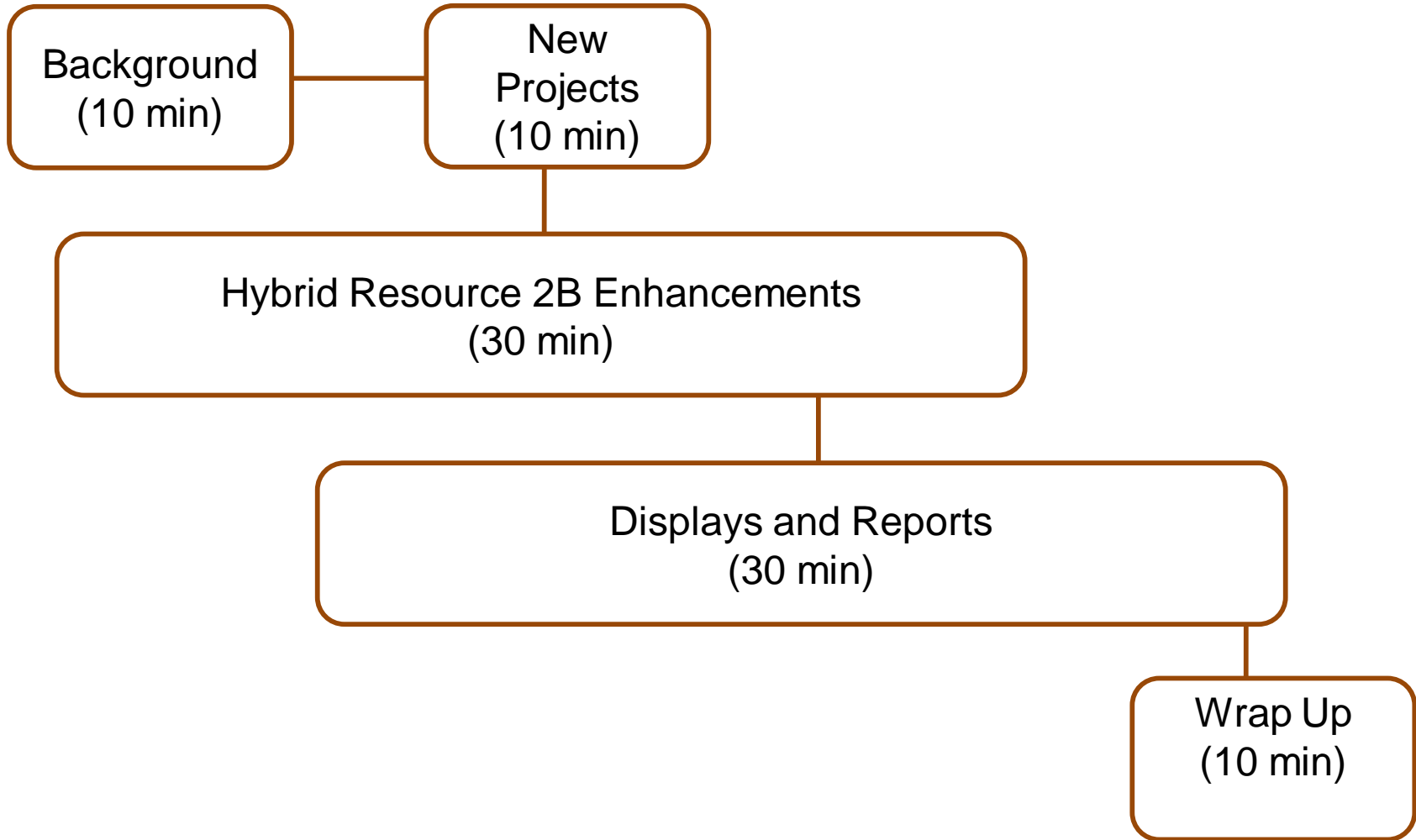


If you have a question, you may either ask over the phone or in the chat

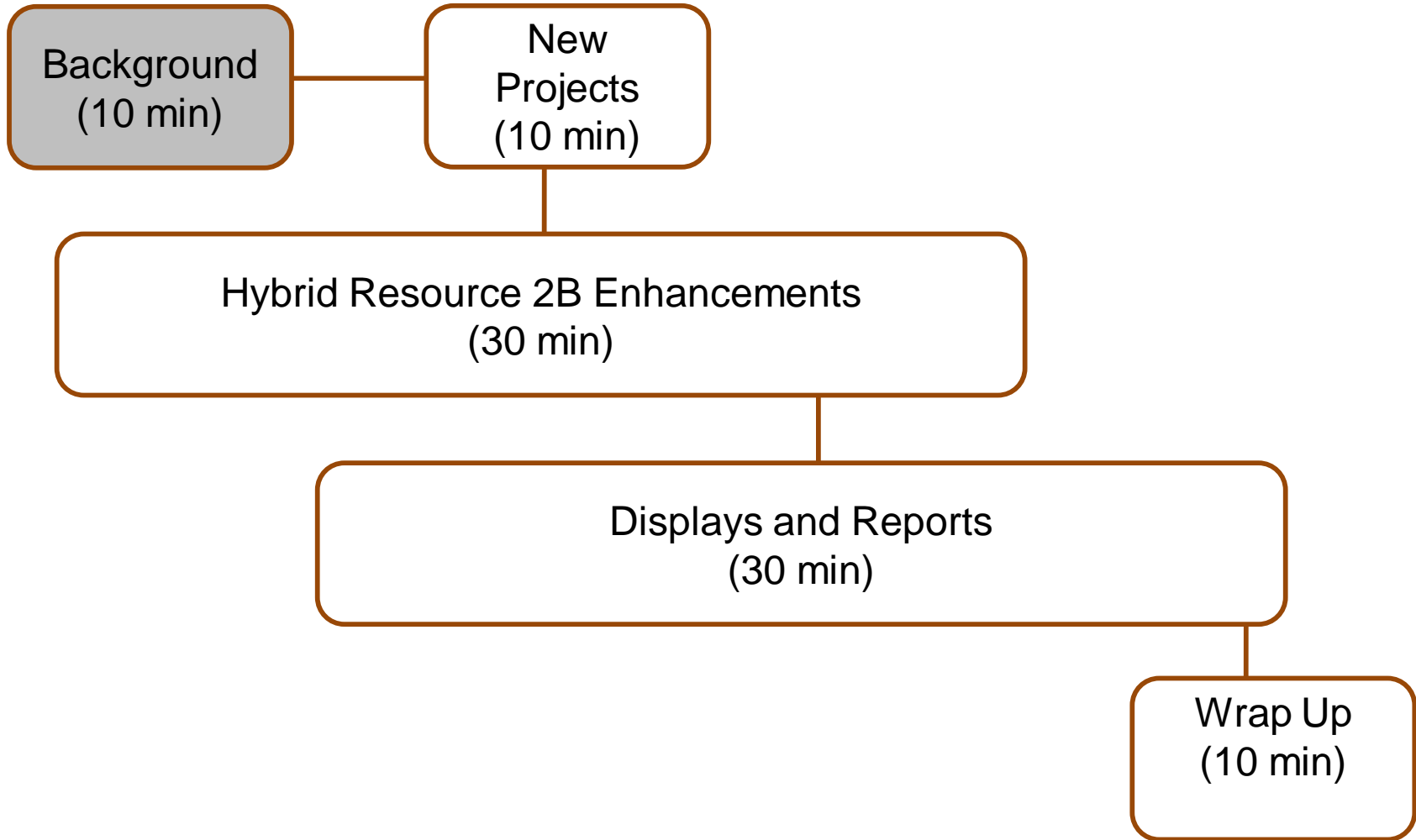


If you want to ask a question, you can virtually “raise your hand” in WebEx

In today's session we'll cover:



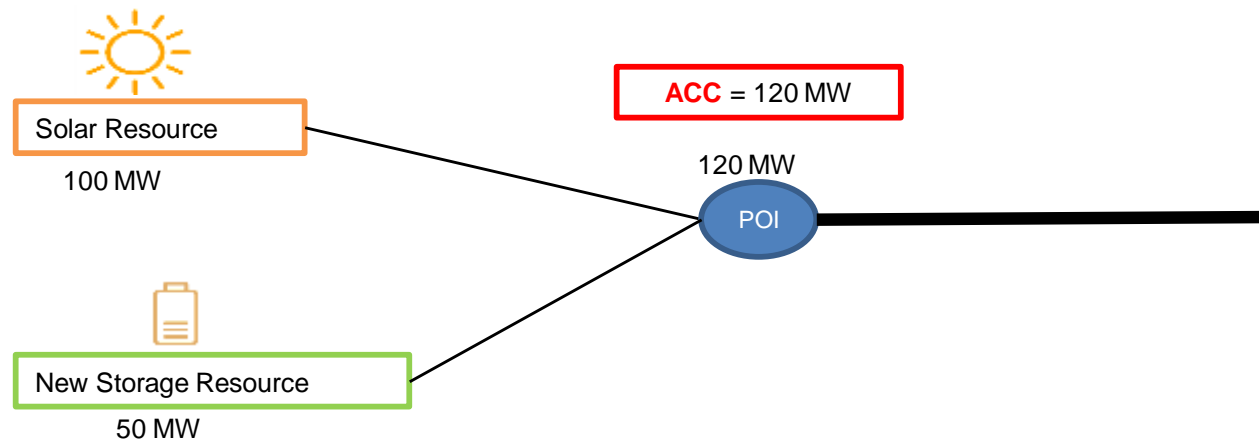
In today's session we'll cover:



Hybrid Resource Project - Phase 1

Co-located Resources - Multiple resources of different technologies that share a common point of interconnection but are modeled as individual resources

Production date – December 2020



Hybrid Resource - Phase 2

Multiple resources of different technologies that share a common point of interconnection; these resources are modeled as one resource

Phase 2-A

Implement High Sustainable Limit (HSL), Ancillary Services (AS),
Production Date – November, 2021

★ Phase 2-B

Implement Master/subordinate Aggregated Capability Constraint (ACC)

Implement Hybrid Dynamic Limit functionality

Changes to various applications, reports and displays

Scheduled Production Date – February 1, 2023

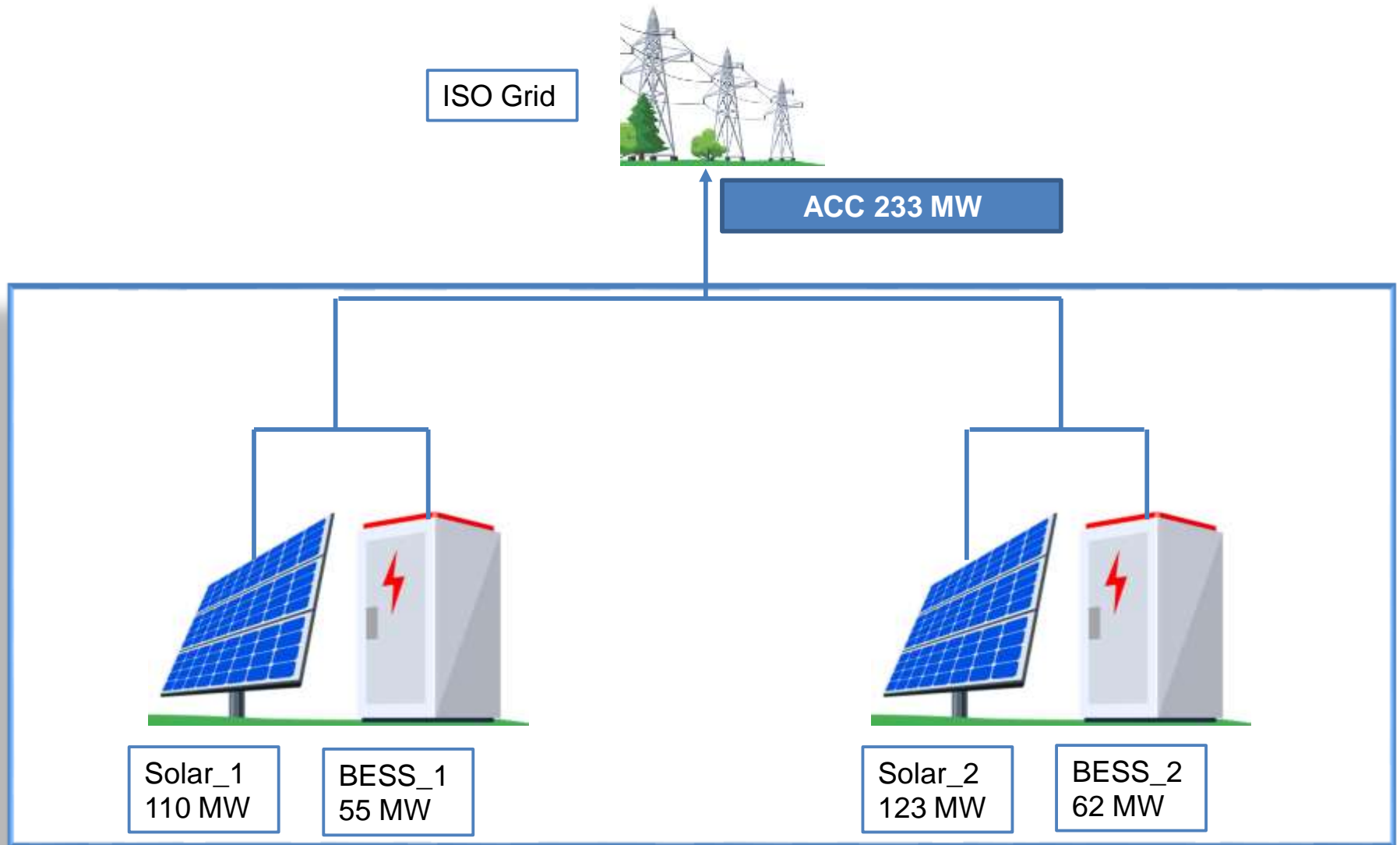
UPDATED
MATERIAL



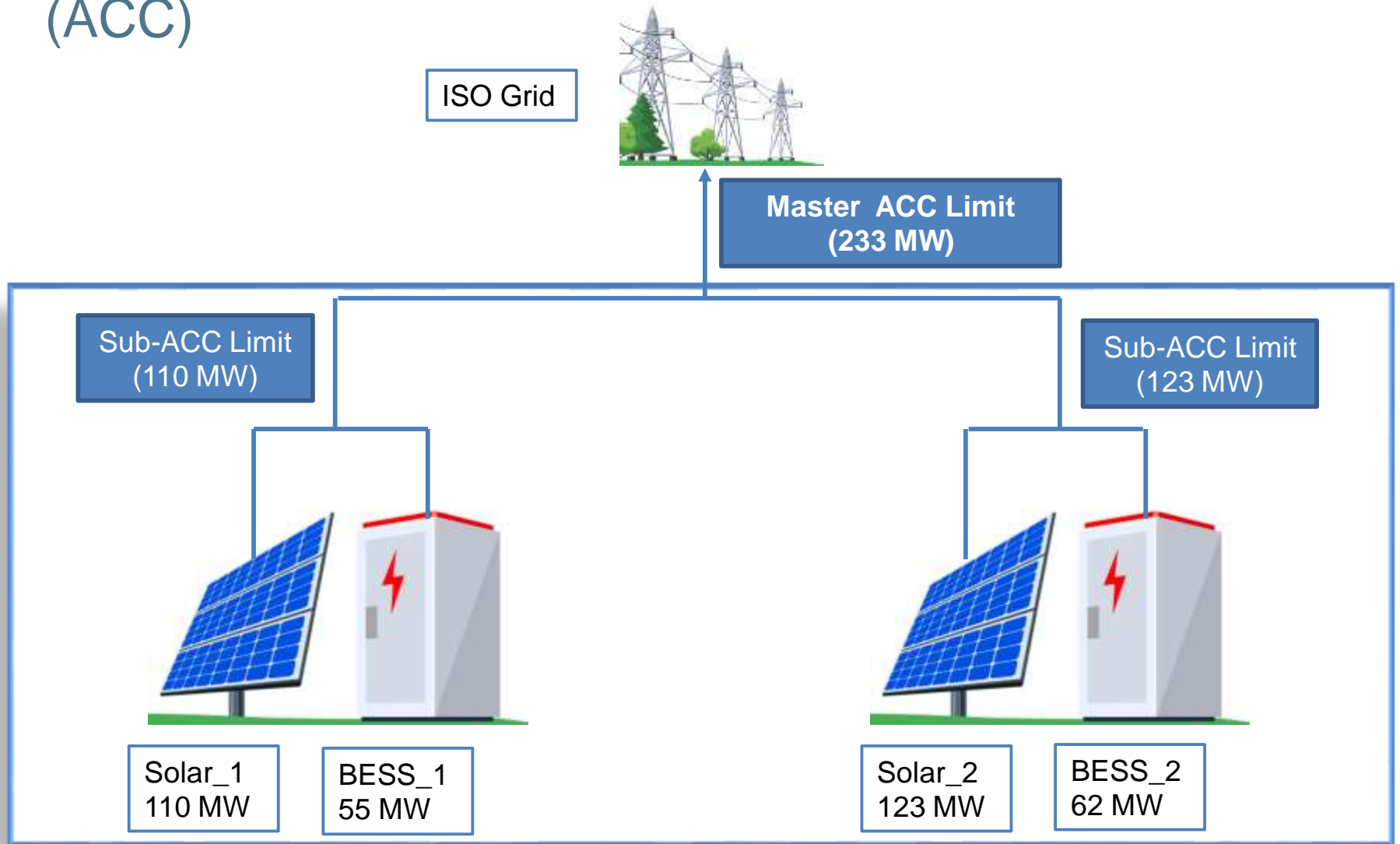
For more information about the Hybrid Resource Initiative visit :

<https://stakeholdercenter.caiso.com/StakeholderInitiatives/Hybrid-resources>

Standalone Aggregate Capability Constraint (ACC)

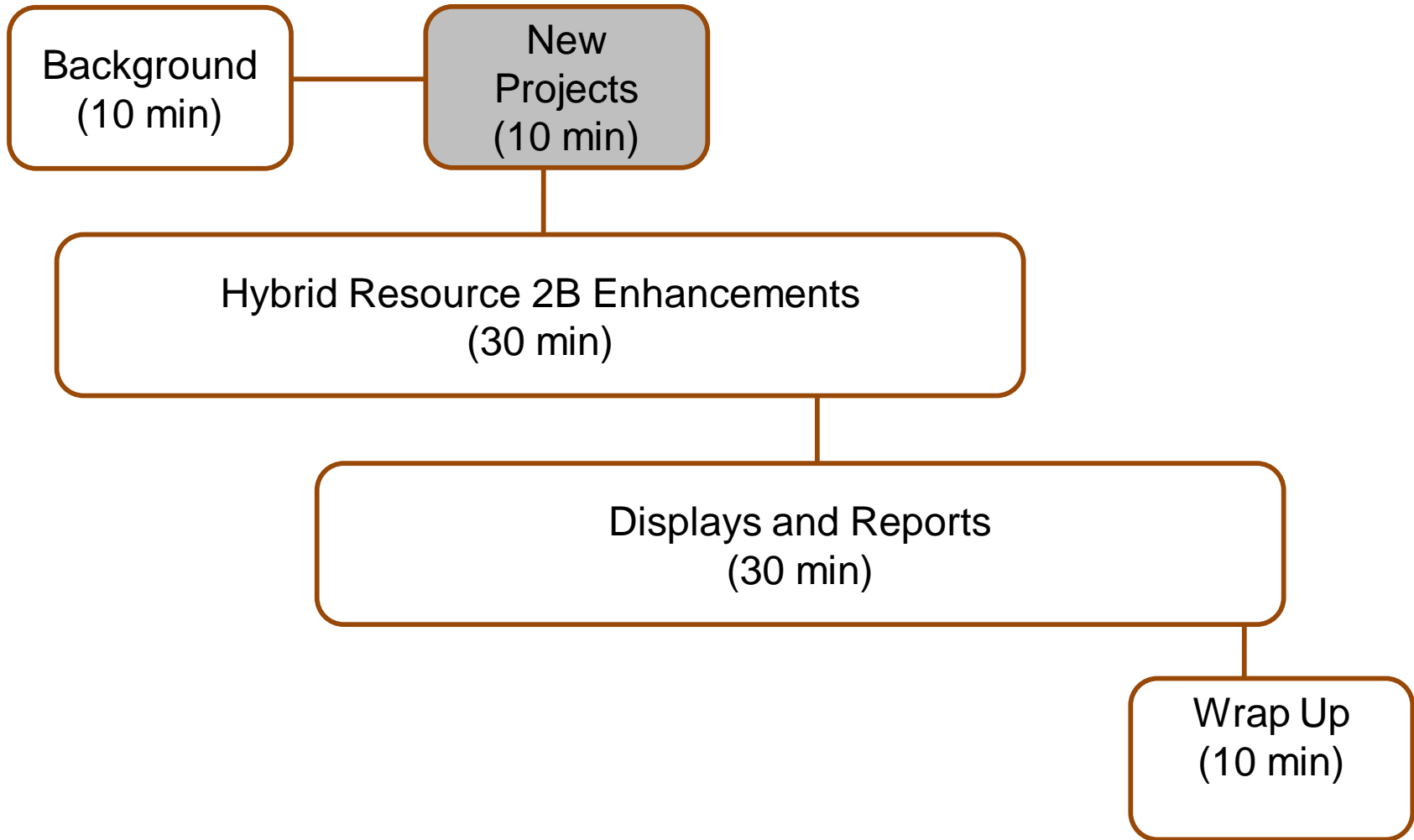


Master and Sub-Aggregate Capability Constraint (ACC)



Q&A

In today's session we'll cover:



Interconnecting to the Grid

What is changing?

- Updated Interconnection Request form
- Updated Project Details form
- New “Hybrid Components” tab in the generator resource data template (GRDT)

Where can I learn more about the interconnection process? Look at the ISO website and attend the next Resource Interconnection Fair.



For more information resource interconnection procedures

<http://www.caiso.com/participate/Pages/ResourceInterconnectionGuide/default.aspx>

Interconnection Request – Appendix 1 Sec. 4.c.

- c. Type of project (i.e., gas turbine, hydro, wind, etc.) and general description of the equipment configuration (if more than one type is chosen include gross installed MW for each).
- **If project is an increase to an existing project, provide values based on the MW increase only.**

Technology

Select Gen Type	Select Fuel Type	<input type="checkbox"/>	(MW)	<input type="checkbox"/>	Co-Located	<input type="checkbox"/>	Hybrid
Select Gen Type	Select Fuel Type	<input type="checkbox"/>	(MW)	<input type="checkbox"/>	Co-Located	<input type="checkbox"/>	Hybrid
Select Gen Type	Select Fuel Type	<input type="checkbox"/>	(MW)	<input type="checkbox"/>	Co-Located	<input type="checkbox"/>	Hybrid

Other (please describe): (MW) Co-Located Hybrid

Generator Type: Fuel Type:

Comments:

General description of the equipment configuration (e.g. number, size, type, etc):

Project Details Form

Submit a new request through the [Resource Interconnection Management System \(RIMS\) public site](#). 1) Fill out the "New Request" section 2) Choose the "NRI Project Details Form" drop down 3) Click "Register". A registration code will be emailed to the email contact in the New Request. 4) Place this code within the "Registration Code" section of the public site. 5) Click "submit" to access the upload screen for the project details form. You will receive an ISO Project code after the form validation is complete. The ISO project code will be used for all filenames.

All fields must be filled in, additional fields for Natural Gas Combustion Turbines complete section 8 A-E.
RIG Reconfiguration, Meter Replacement and Meter Maintenance Project Types please only fill out rows 1, 2A- 2G, 3A-C, 6A, 7A-C only.
 The following characters are not allowed in any filename: ~ ' # % & @ * { } ; ; < > ? / \ | () [] - _

1	Project Type: Select One	
2		Authorized Contact(s) for the Resource
A	Project	Resource owner. A consultant or third party is not an acceptable contact. Consultants can be added using the email field below.
B	Project Contact Information	
C	Authorized Contact(s) Email	Multiple email addresses with a semi colon ";" between them. These email addresses will only receive project updates.
D	Full Legal Name of Contact	Secretary of State Business License.
E	Legal Address of Contact	City: <input type="text"/> State: <input type="text"/> Zip Code: <input type="text"/>
F	Resource Name (facility; unit; location) (Resource ID will not be accepted if name is not unique) Energy Information Administrator	The resource name that will be used in the CAISO Master File and in Regulatory contracts is subject to CAISO approval. See resource naming guidelines found in the NRI Project RegulatoryContracts@caiso.com for approval. EIA Generator ID <input type="text"/>
G	Project Description	The EIA Plant Code as generated and provided by the EIA. The generator ID supplied to the EIA. This ID must be uniquely defined within a plant.

Provide an explanation of the project. Meter Replacement include CAISO meter device ID's

- Select One
- Solar
- Wind/Wind Repower
- Existing QF
- Wind QF
- Conventional
- Dynamic
- Dynamic New Construction
- Pseudo
- Pseudo New Construction
- Non-Generation**
- Storage
- Load
- Custom LAP
- Meter Replacement
- Meter Maintenance
- RIG Reconfiguration

Generator Information

A	PTO/UDC (transmission/utility owner):	Select One (If not listed please pick closest)
B	<u>Net Output</u> Generation MW for this Resource:	<input type="text"/> Note: May not exceed the Interconnection Agreement studied MW value.
C	Configuration, Fuel Type(s) and MW(s):	<p>Configuration: Select One</p> <div style="border: 1px solid gray; padding: 5px; width: fit-content;"><p>Fu Select One</p><p>MW Single</p><p>Fo Hybrid</p><p>If p Co-located</p><p>Hybrid Co-Located</p></div> <p>Additional Fuel Type 2: Select One MW: <input type="text"/></p> <p>Forecast Election: Select One <i>Choose Additional fuel type(s) for a mixed fuel resource</i></p> <p>Additional Fuel Type 3: Select One MW: <input type="text"/></p> <p>Additional Fuel Type 4: Select One MW: <input type="text"/></p> <p>Forecast Election: Select One <i>Choose Additional fuel type(s) for a mixed fuel resource</i></p>
D	Point of Interconnection:	If Known The more detailed information provided here will expedite the modeling.
E	Connection Voltage:	SELECT kV Connection at the utility substation or tap (Select closest value. If less than 12kV Select 12kV)
F	Nearest 60kV or Up Substation Name:	<input type="text"/> (Can be pole/tower number, bank/bay number, and location name of a tap)
G	Generator Interconnection Agreement? Agreement Type: Select One Enter number here: <input type="text"/>	<ul style="list-style-type: none">• If 2-party, enter Agreement number below (<u>i.e. WDAT Number, Rule 21 Number, etc.</u>)• If 3-party, look-up CAISO Queue Position number here and enter Queue # below, if multiple Queue numbers apply to this project separate with a comma.• If 3-party QF, please enter Queue Position number in the number field, see Section 4 of NRI Guide.• If Dynamic or Pseudo Generator choose the same <u>Agreement and Project Type</u>

Generator Resource Data Template (GRDT)

T	Code	RESOURCE	RAMPRATE
---	------	-----------------	----------

Fuel type = HYBD for mixed fuel resources

Completed by Master File Team
Modifiable by customer

	A	B	C	D	J	BD	BE
1	PGA Name	Scheduling Coordinator ID	Resource ID	Resource Name	Fuel Type	Certified for RUC?	Market Power Mitigation Participation Flag
2	PGA_NAME	SC_ID	RES_ID	RES_NAME	FUEL_TYPE	CERT_RUC	LMPM
3	Example Hybrid, LLC	XXXX	EXAMPLE_2_HYB1	Example Hybrid	HYBD	N	N
4							
5							
6							
7							
8							
9							
10							

Flags set for hybrid resources

NEW MATERIAL

Generator Resource Data Template (GRDT)

OP RES RAMP	HYBRID_COMPONENTS	MSG
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Name of the Hybrid Resource

Name of individual component

Completed by Master File Team

Modifiable by customer

	A	B	C	D	E	F
1	Resource ID	Component_ID	FUEL_TYPE	GEN_TECH_TYPE	MAX_GEN	MIN_GEN
2	EXAMPLE_2_HYB1	EXAMPLE_2_HYB1_SOLR1	SOLR	PHOT	130	0
3	EXAMPLE_2_HYB1	EXAMPLE_2_HYB1_SOLR2	SOLR	PHOT	130	0
4	EXAMPLE_2_HYB1	EXAMPLE_2_HYB1_LESR1	LESR	OTHR	36	-36

Fuel type of the component

Specific technology used for the fuel type

Pmax and Pmin

UPDATED MATERIAL

Generator Resource Data Template (GRDT)

OP RES RAMP	HYBRID_COMPONENTS	MSG
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Identifies VER component of NGR

ISO or SC Forecast

Completed by Master File Team

Modifiable by customer

	A	B	G	H	I	J	K	L
	Resource ID	Component_ID	VER_NGR	FORECAST_SELECTION	DISP	MIN_CONT_ENERGY_LIMIT	MAX_CONT_ENERGY_LIMIT	ENERGY_EFFIC
2	EXAMPLE_2_HYB1	EXAMPLE_2_HYB1_SOLR1	Y	ISO	N			
3	EXAMPLE_2_HYB1	EXAMPLE_2_HYB1_SOLR2	Y	SC	N			
4	EXAMPLE_2_HYB1	EXAMPLE_2_HYB1_LESR1			Y	1	144	0.9

N – Wind and Solar
Y – Storage

Minimum/Maximum State of Charge

% of charging energy a battery can store and later discharge

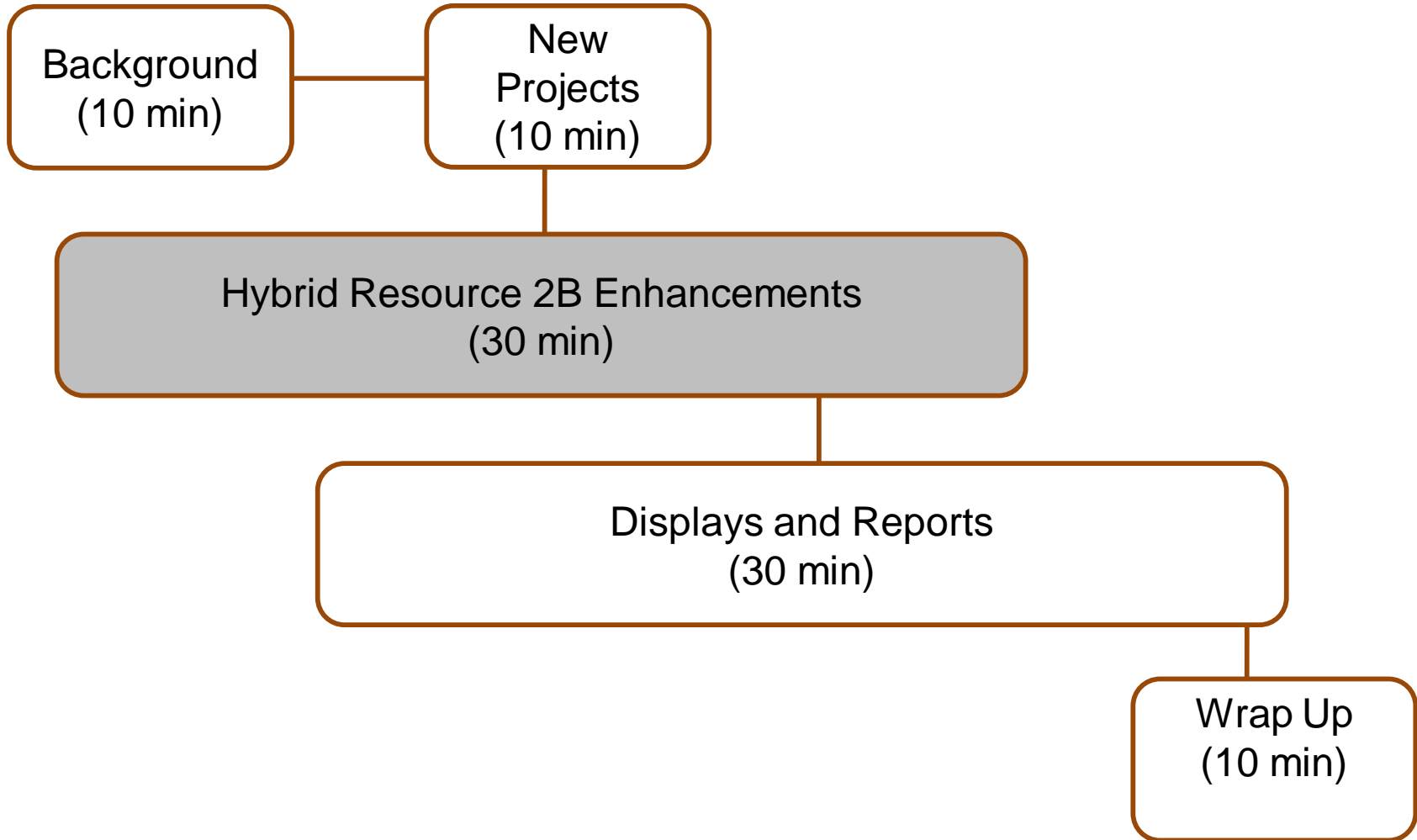
(Used for Effective Flexible Capacity (EFC) calculations)

New Hybrid Resource – Action Items

- Use the updated Interconnection Request form and submit via RIMS
- Use the updated Project Details Form and submit via RIMS
- GRDT – Submit via RIMS (new) or Master File UI (updates)
 - Update modifiable fields, as necessary
 - Check non-modifiable fields for accuracy
 - Submit concerns to RDT@caiso.com

Q&A

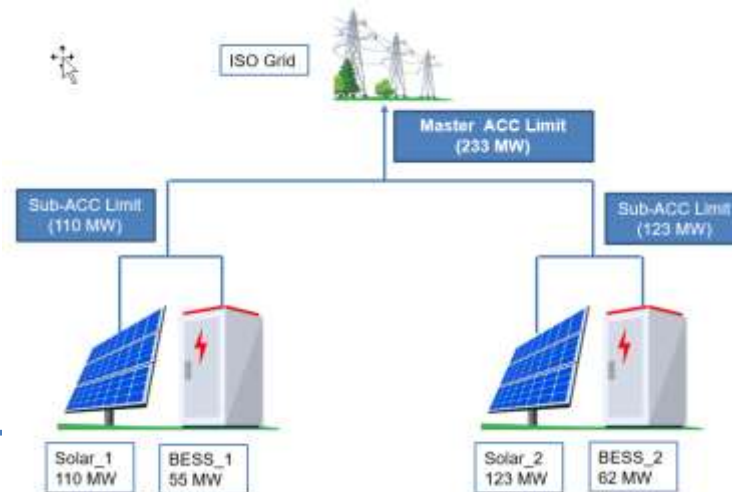
In today's session we'll cover:



Requesting Master and Sub-ACC

Why would I do this? Used in situations where there are contractual limitations on components that are subordinate to the aggregate capacity constraint of the interconnection.

Why is this important? So that co-located resources are dispatched appropriately.



New Master and Sub-ACC– Action Items

- ISO BAA participants
 - Work with ISO contracts department to set up/update the Participating Generator Agreement (PGA)

- WEIM participants
 - New resources – include request in SC Letter
 - Existing resources – submit a CIDI ticket with this request

SC Forecast Selection

What is this? Hybrid customers can choose to submit their own VER forecast data to the ISO, rather than using the ISO's forecast.

Is this available for other VER resources? Yes, for dispatch and settlement purposes only. An ISO forecast will still be needed for forecasting and internal DOT formation.

How do SCs submit them? Via the Automated Load Forecast System (ALFS) using the API



The technical specifications are located on the Developer's site (registration required):

<https://developer.aiso.com/>

Signing up to provide SC Forecast

- New customers
 - WEIM participants – request during the onboarding process
 - CAISO BAA participants – request during the NRI process
- Existing customers that want to switch forecast options should submit a CIDI ticket request



Apps ▾

Releases

Resources ▾

Support ▾

Contact

ADS

Automated Dispatch System

ALFS

Advanced Load Forecasting System

BAAOP

Balancing Area Authority Operator Portal

BSAP

Base Schedule Aggregation Portal

CIRA

Customer Interface for Resource Adequacy

MNS

Market Notification Service

MRI-S

Market Results Interface - Settlements

OASIS

Open Access Same time Information System

OMS

Outage Management System

RCBSAP

Reliability Coordinator Base Schedule Aggregation Portal Interface

Tech Specs

About status

NAME	STATUS	RELEASE	LAST UPDATED
ALFS Interface Specification v1.0.0.pdf	PROD_LATEST	Fall 2017	12/6/2019
ALFS Interface Specification v1.2.pdf	PROD_LATEST	2020	3/13/2020
ALFS SC VER Interface Specification v1.0.pdf	UPCOMING	Fall 2022	5/25/2022
RC ALFS Interface Specification v1.0.0.pdf	PROD_LATEST	2019	12/6/2019



SC Forecast – Action Items

- New customers – indicate your forecast choice in the onboarding process
- Existing customers – submit a CIDI ticket if you want to change your forecast option
- Submit forecast via ALFS (not SIBR)

What are they? Minimum and maximum MW limits for Hybrid Resources that can be submitted for every 5 minute interval.

Why are they important? Enables SC to limit the dispatch instruction from the ISO for positions of the bid curve that are unavailable for dispatch based on actual production limitations for the hybrid resource.

How do SCs submit them? Via SIBR using the API or the UI.



The SIBR User Guide is located at:

<http://www.caiso.com/participate/Pages/ApplicationAccess/Default.aspx>

New – Hybrid Dynamic Limit



Real-Time Energy Bid
25 MW for the hour

Forecast of resource availability forecast for the hour

Interval	:05	:10	:15	:20	:25	:30	:35	...	:00
Upper Limit	25 MW	23 MW	25 MW	22 MW	20 MW	22 MW	20 MW	...	19 MW
Lower Limit	1 MW	1 MW	1 MW	1 MW	1 MW	1 MW	1 MW	...	1 MW

Dynamic Limits

California ISO | Developer

Apps ▾ Releases Resources ▾ Support

ADS Automated Dispatch System	MNS Market Notification Service
ALFS Advanced Load Forecasting System	MRI-S Market Results Interface - Settlements
BAAOP Balancing Area Authority Operator Portal	OASIS Open Access Same time Information System
BSAP Base Schedule Aggregation Portal	OMS Outage Management System
CIRA Customer Interface for Resource Adequacy	RCBSAP Reliability Coordinator Base Schedule Aggregation Portal Interface
CMRI Customer Market Results Interface	RCEIDE Reliability Coordinator Electrical Industry Exchange Adapter (EIDE)
DRRS Demand Response Registration System	SIBR Scheduling Infrastructure Business Rules
HANA Hosted Advanced Network Applications	
MFRD MasterFile	

<https://developer.caiso.com>

California ISO | Market

Application Access

- AIM** Access and Identity Management
- [AIM Computer Based Training](#)

Inquiries & Disputes

- CIDI** Customer Inquiry Dispute and Information

Market & Operations

- ADS** Automated Dispatch System
- CMRI** Customer Market Results Interface
- CRR** Congestion Revenue Rights
- SIBR** Scheduling Infrastructure & Business Rules
- SIBR Reports** Scheduling Infrastructure & Business Rules Reports

Bids

Trades

Convergence Bids

Energy Forecast

Ind Viewer

OTC Viewer

Messages

Dynamic Limit

Ancillary Service

Date: 02/11/2022



Coordinator:

Apply

Dynamic Limit



Status Resource Limit [MW] Submitted

Enter the date and the Scheduling Coordinator ID
Select Apply to reveal the grid

Select the new Dynamic Limit Tab



Dynamic Limit



St	Resource	Time start	Minimum limit [MW]	Maximum limit [MW]	Submitted
----	----------	------------	--------------------	--------------------	-----------

Click the "Create Dynamic limit" icon



A new window will open.

Create dynamic limit [X]
Coordinator: ▼
Resource: ▼
Minimum limit value: []
Maximum limit value: []
[Create] [Cancel]

Select a resource from the drop down. Also add the Minimum and Maximum limit values.

Click Create.

Date: 02/11/2022 Coordinator: [dropdown]

Apply

Dynamic Limit

1 - 25 of 74

Status	Time start	Minimum limit [MW]	Maximum limit [MW]	Submitted
[pencil]	_7_ES1	02/11/2022 09:05		
[pencil]	_7_ES1	02/11/2022 09:10		
[pencil]	_7_ES1	02/11/2022 09:15	1.00	2.00
[pencil]			2.00	
[pencil]			2.00	
[pencil]			2.00	
[pencil]			2.00	
[pencil]			2.00	
[pencil]			2.00	
[pencil]			2.00	
[pencil]			2.00	
[pencil]	_7_ES1	02/11/2022 09:55	1.00	
[pencil]	_7_ES1	02/11/2022 10:00	1.00	
[pencil]	_7_ES1	02/11/2022 10:05	1.00	
[pencil]	_7_ES1	02/11/2022 10:10	1.00	
[pencil]	_7_ES1	02/11/2022 10:15	1.00	
[pencil]	_7_ES1	02/11/2022 10:20	1.00	
[pencil]	_7_ES1	02/11/2022 10:25	1.00	
[pencil]	_7_ES1	02/11/2022 10:30	1.00	
[pencil]	_7_ES1	02/11/2022 10:35	1.00	2.00
[pencil]	_7_ES1	02/11/2022 10:40	1.00	2.00
[pencil]	_7_ES1	02/11/2022 10:45	1.00	2.00
[pencil]	_7_ES1	02/11/2022 10:50	1.00	2.00
[pencil]	_7_ES1	02/11/2022 10:55	1.00	2.00
[pencil]	_7_ES1	02/11/2022 11:00	1.00	2.00
[pencil]	_7_ES1	02/11/2022 11:05	1.00	2.00

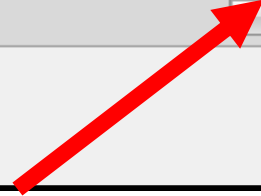
The pencil icon enables you to edit the limits



The double arrow and triple arrow icons enable you to submit the limits.



Click "Apply" to save the changes.





Dynamic Limits – Action Items

- Using SIBR UI or API, submit dynamic limit information (minimum and maximum MW) for hybrid resources, every 5 minutes for:
 - Ambient unavailability
 - Unavailability due to:
 - lack of fuel (e.g., wind, sun)
 - State of charge
 - Reflecting onsite charging

What are the requirements? Each VER and storage component of a hybrid resource must have metering and telemetry.

Why is this important? These requirements impact settlements, visibility and reporting for these resources.

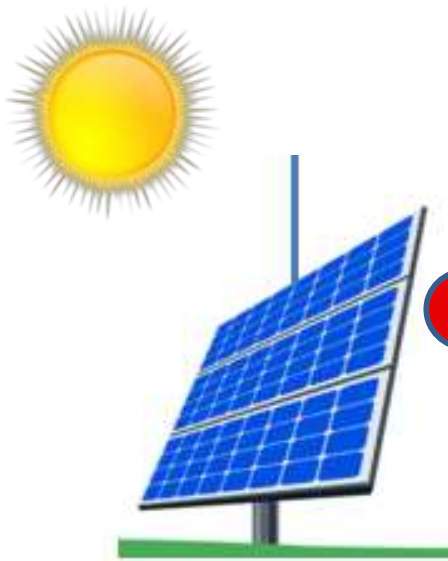
Where can I learn more? The BPM for Metering outlines all of the requirements.



The BPM for Metering is located at:

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Metering>

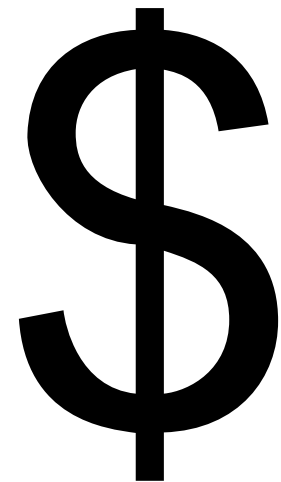
Hybrid resources are required to have revenue quality meters for all VER components to enable the ISO to properly calculate the forecasting fee.



X

Forecast
Fee

=



NEW
MATERIAL

Telemetry is required for all hybrid components

NEW
MATERIAL

Visibility in
actual operation
of each
component

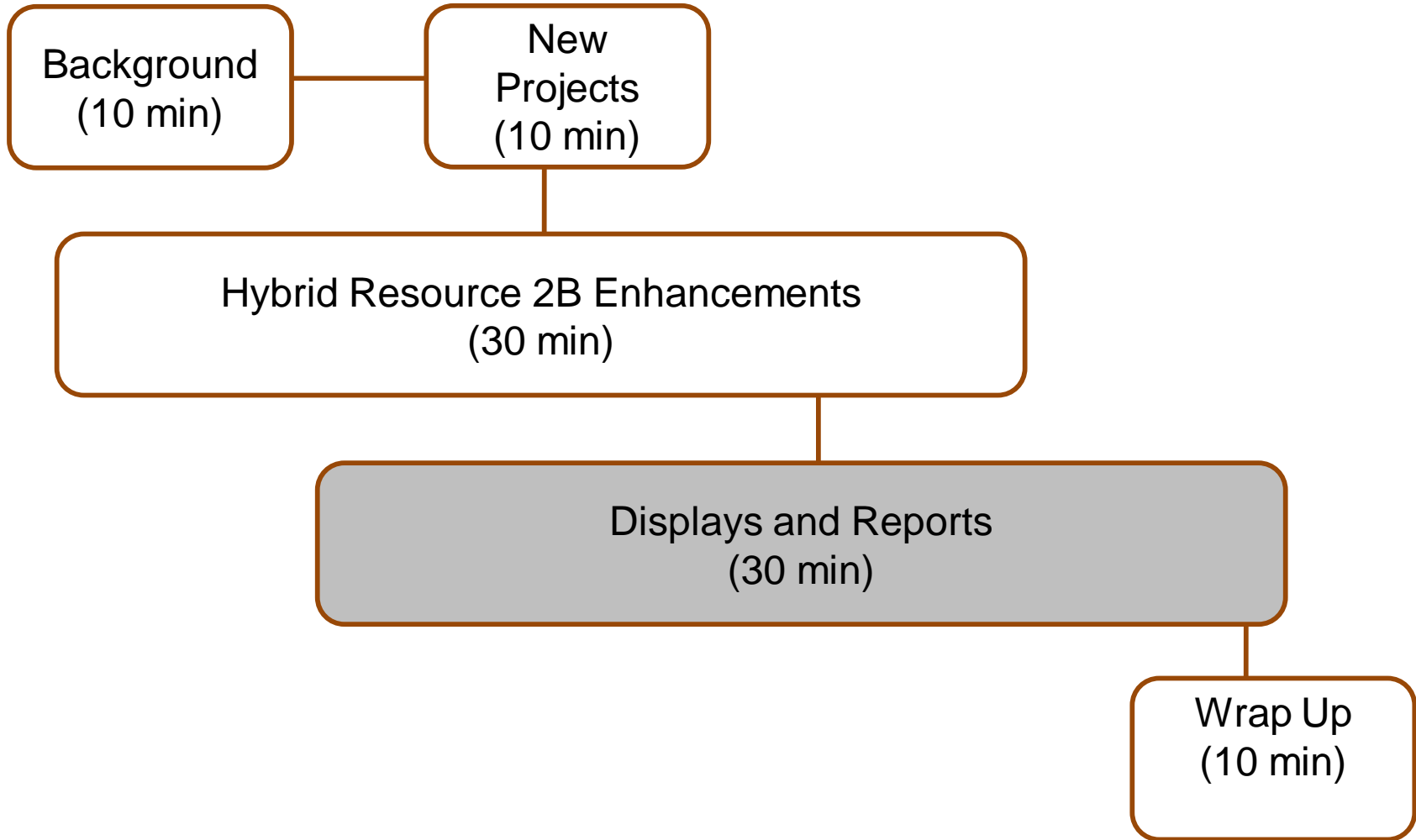
- Energy/ancillary services
- Good quality forecasting

Reporting
requirements

- CPUC, CEC
- WREGIS, WECC
- Today's Outlook/ISO Today

Q&A

In today's session we'll cover:



What is it? An application used to communicate real-time dispatch instructions to Scheduling Coordinators.

Is there a new display? No, the displays did not change.

What is changing? The rules associated with the FOLLOW DOT flag have been expanded to include situations where VER resources have AS awards.

ADS Clarification – FOLLOW DOT flag is “Y” if:

Existing Criteria

- There is an operating instruction in place
- SUPP < 0

Additional Criteria

- A VER associated with a co-located or hybrid resource has an AS award
- A VER associated with a co-located resource within a standalone ACC has an AS award
- All VERs in a subordinate ACC if any resource has an AS award

NEW
MATERIAL

Balancing Authority Area Operations Portal (BAAOP) - WEIM Application

What is it? Used by the WEIM operators to monitor market operations.

Is there a new display? Yes, Dynamic Limits.

Is anything else changing? Yes, We are adding some new columns to the ACC Schedules and ACC Constraints displays.

BAAOP – Coming Soon – Hybrid Resources Phase 2B

The screenshot displays the California ISO software interface. At the top left is the California ISO logo with the tagline "Shaping a Renewed Future". To the right is a blue navigation bar with the "SIEMENS" logo. Below the navigation bar is a breadcrumb trail: "EIM | Transmission | Input | System | NA | Coming Soon – Live Data". The main content area is titled "RTD > Interval > Dispatch Execution Control". Under "Case Definition", there are input fields for "Trading Period Start" (08/09/2022 20:10), "Trading Period End" (08/09/2022 21:00), "Trading Interval [mins]" (5), and "No of Intervals" (10). A dropdown menu is open under "Coming Soon – Live Data", showing options: "EIM 2020", "BPA", "Hybrid Resources - Phase 2B" (selected), "ACC Constraints", "ACC Schedules", and "Dynamic Limits". A sub-menu for "Dynamic Limits" is also open, showing options: "RTD", "RTPD", "STUC", and "RTBS".

BAAOP – Dynamic Limits Display

The screenshot displays the California ISO EIM interface. The top navigation bar includes 'Transmission', 'Input', 'Schedules', 'System', 'NA', and 'Coming Soon - Live Data'. The main breadcrumb trail is 'EIM > Coming Soon - Live Data > Hybrid Resources - Phase 2B > Dynamic Limits > RTD'. Filter settings are set to 'BAA: [ALL]', 'Resource Name: [ALL]', 'Interval End: [ALL]', and 'Pass: RTD'.

The 'Dynamic Limits' table shows the following data:

BAA	Resource	Interval End	Upper	Lower
CISO		08/09/2022 19:50	163.00	12.35
CISO		08/09/2022 19:55	163.00	12.35
CISO		08/09/2022 20:00	163.00	12.35
CISO		08/09/2022 20:05	163.00	12.35
CISO		08/09/2022 20:10	160.00	0.00
CISO		08/09/2022 20:15	160.00	0.00
CISO		08/09/2022 20:20	160.00	0.00
CISO		08/09/2022 20:25	160.00	0.00
CISO		08/09/2022 20:30	160.00	0.00
CISO		08/09/2022 20:35	160.00	0.00
CISO		08/09/2022 20:40	160.00	0.00
CISO		08/09/2022 20:45	160.00	0.00
CISO		08/09/2022 20:50	160.00	0.00
CISO		08/09/2022 20:55	160.00	0.00
CISO		08/09/2022 21:00	160.00	0.00
CISO		08/09/2022 21:05	160.00	0.00
CISO		08/09/2022 21:10	160.00	0.00
CISO		08/09/2022 21:15	160.00	0.00
CISO		08/09/2022 21:20	160.00	0.00
CISO		08/09/2022 21:25	160.00	0.00
CISO		08/09/2022 21:30	160.00	0.00
CISO		08/09/2022 21:35	160.00	0.00
CISO		08/09/2022 21:40	160.00	0.00
CISO		08/09/2022 21:45	160.00	0.00
CISO		08/09/2022 21:50	160.00	0.00

The 'Resource' table shows the following data:

BAA	SC ID	Resource	Interval End	Pmin	Pmax	Status	RJ	RD	SPIN	NSPIN	DOT	Market Override
CISO			08/10/2022 10:00	-36	166	On-Line Production	0	0	0	0	0	
CISO			08/10/2022 10:05	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:10	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:15	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:20	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:25	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:30	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:35	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:40	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:45	-36	166	On-Line Production	0	0	0	0	166	
CISO			08/10/2022 10:50	-36	166	On-Line Production	0	0	0	0	166	

BAAOP – ACC Constraints

The screenshot displays the California ISO web application interface for managing ACC Constraints. The main navigation bar shows 'California ISO' and 'Coming Soon - Live Data'. The breadcrumb trail indicates the current view is 'ACC Constraints' under 'Hybrid Resources - Phase 2B'.

ACC Constraints Table:

ACC ID	BAA	ACC Name	Type	Injection Limit [MW]	Withdrawal Limit [MW]	Override Limit [MW]
225	CISO		Sub	70.00	-150.00	
777	CISO		Master	100.00	-25.00	
181	CISO		Sub	2.50	-1.00	

Sub-ACC Constraints Table:

ACC ID	BAA	ACC Name
225		
181		

ACC Resources Table (ACC Name: MASTER_ACC):

BAA	SC ID	Resource	Price Node	Resource Type	Unit	Type	Pmin	Pmax	Ramp Up	Ramp Dn	Min Up Time	Min Down Time	Max Starts	Daily
CISO				G	LES		-35.00	35.00			0	0		300
CISO				G	IP		0.00	70.00	35.00	35.00	0	0		100
CISO				G	LES		-0.65	0.70			0	0		300
CISO				G	VER		0.00	2.50	0.40	0.40	0	25		8

Generator Detail Table (Resource: 1):

Quantity [MW]	Lower Ramp Rate [MW/min]	Raise Ramp Rate [MW/min]
-35.00	999.00	999.00
0.00	999.00	999.00
35.00	999.00	999.00

Ramp Rates Graph:

Summary Table (Bottom):

CISO	BLST			G	LES		-43.00	43.00	999.00	999.00	0	0		98
CISO	BCE1			G	LES		-115.00	115.00	999.00	999.00	0	0		100
CISO	BCE1			G	LES		-115.00	115.00	999.00	999.00	0	0		1
CISO	BLST			G	VER		0.00	110.00	20.00	20.00	0	18		10
CISO	BCE1			G	VER		0.00	125.00	12.00	12.00	0	18		5

BAAOP - ACC Schedules

UPDATED MATERIAL

EIM > Coming Soon – Live Data > Hybrid Resources - Phase 2B > ACC Schedules > RTPD

BAA [ALL] Resource [ALL] Trade Date 11/20/2022 Apply Reset Pass RTPD

Live data, any edits will be implemented. You are responsible for any operational or market impacts resulting from performed actions.

▼ ACC Constraint Schedules

Rows 1 - 25 of 52 Time stamps/Data points

		11/20/2022 17:30								11/20/2022 17:45							
ACC ID	BAA	ACC Name	Direction	Type	EN Sched	EN & AS	Eff Lim Inj	Eff Lim With	Viol	SPrice	EN Sched	EN & AS	Eff Lim Inj	Eff Lim With	Viol	SPrice	
			DN	Standalone		50.00	500.00	-50.00	0.00	0.00		50.00	500.00	-50.00	0.00	0.00	
			UP	Standalone		50.00	500.00	-50.00	0.00	0.00		50.00	500.00	-50.00	0.00	0.00	
			DN	Standalone		102.00	400.00	-242.00	0.00	0.00		102.00	400.00	-242.00	1.10	0.00	
			UP	Standalone		102.00	400.00	-242.00	0.00	0.00		102.00	400.00	-242.00	1.10	0.00	
			DN	Standalone		0.00	17.00	0.00	0.00	0.00		0.00	17.00	0.00	0.00	0.00	
			UP	Standalone		0.00	17.00	0.00	0.00	0.00		0.00	17.00	0.00	0.00	0.00	
			DN	Standalone		0.00	10.00	0.00	0.00	0.00		0.00	10.00	0.00	0.00	0.00	
			UP	Standalone		0.00	10.00	0.00	0.00	0.00		0.00	10.00	0.00	0.00	0.00	
			DN	Standalone		0.00	18.00	0.00	0.00	0.00		0.00	18.00	0.00	0.00	0.00	
			UP	Standalone		0.00	18.00	0.00	0.00	0.00		0.00	18.00	0.00	0.00	0.00	
			DN	Standalone		0.00	18.00	0.00	0.00	0.00		0.00	18.00	0.00	0.00	0.00	
			UP	Standalone		0.00	18.00	0.00	0.00	0.00		0.00	18.00	0.00	0.00	0.00	
			DN	Standalone		0.00	16.00	0.00	0.00	0.00		0.00	16.00	0.00	0.00	0.00	
			UP	Standalone		0.00	16.00	0.00	0.00	0.00		0.00	16.00	0.00	0.00	0.00	
			DN	Standalone		0.00	14.00	0.00	0.00	0.00		0.00	14.00	0.00	0.00	0.00	
			UP	Standalone		0.00	14.00	0.00	0.00	0.00		0.00	14.00	0.00	0.00	0.00	
			DN	Sub		0.00	17.00	0.00	0.00	0.00		0.00	17.00	0.00	0.00	0.00	
			UP	Sub		0.00	17.00	0.00	2.30	0.00		0.00	17.00	0.00	0.00	0.00	
			DN	Standalone		20.00	280.00	-60.00	0.00	0.00		35.00	280.00	-60.00	0.00	0.00	
			UP	Standalone		20.00	280.00	-60.00	0.00	0.00		35.00	280.00	-60.00	0.00	0.00	

Open Access Same-time Information System (OASIS) Reports

What does it contain? Market and operations data that is available to the public via caiso.com.

Which existing reports are impacted?

None

Are there new reports?

Aggregate Capability Constraint Shadow Prices

Aggregate Capability Constraint Shadow Prices



California ISO

OASIS



ATLAS REFERENCE REPORT DEFINITION PRICES TRANSMISSION SYSTEM DEMAND ENERGY ANCILLARY SE

Date : 12/30/2022 Market: DAM Constraint Name [ALL]

Download XML

Download CSV

Aggregate Capability Constraint Shadow Prices

0 - 0 of ???

Market	Opr Date	Constraint Name	¹ Direction	² Interval	³ HE01	HE02	HE03	HE04	HE05	HE06	HE07
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No Data found

Report Generated: 12/30/2022 17:49:27

Market Participant Portal (MPP) Reports

What does it contain? It provides links to reports and applications used by market participants.

Which existing reports are impacted?

Transmission Limits

Are there new reports?

No

[MPP Home](#)[Market Modeling Data](#)[System Integration Discussions](#)[RC Working Groups](#)[HANA](#)

Market Modeling Data

This data is protected under ISO tariff and can only be viewed by or shared with persons that have fully executed the applicable Non-Disclosure Agreement.

PLEASE NOTE THAT THIS DATA IS AVAILABLE FOR A LIMITED TIME PERIOD (90-DAY ROLLING LOOK BACK), AFTER WHICH IT WILL NOT BE ACCESSIBLE. PLEASE ACCESS AND DOWNLOAD ACCORDINGLY.

To the best of CAISO's knowledge, the information contained herein is true and accurate as of the date published and is provided for informational purposes only. CAISO does not assume any liability whatsoever for the accuracy and completeness of the published information.

Load Distribution Factors (LDF)

Displays the load distribution factors by node used in the Day-Ahead Market. To protect confidential data the load distribution factors for single customer nodes are aggregated and reported by DLAP.

Shift Factors (SF)

Displays the complete list of shift factors for all binding constraints. In the IFM, HASP, and RTD markets.

Transmission Limits (TL)

Displays the transmission limits for all critical constraints in the IFM, HASP, FMM (RTUC), and RTD markets. The term "critical" refers to being close to or at the limit.

Current View ...

Name	Modified
Transmission Limits	December 12, 2012
Shift Factors	December 12, 2012
Load Distribution Factors	December 12, 2012

Customer Market Results Interface (CMRI) Reports

What does it contain? CMRI reports contain customer-specific market results and information.

Which existing reports are impacted?

Interval Variable Energy Resource Forecast Report

Variable Energy Resource Forecast Report

Are there new reports?

ACC Definition

Trade Date: Entity: Resource: Forecast Type:

Interval Variable Energy Resource Forecast

Forecast Type Trade Date SC ID Resource Component ID Interval HE01 [MW] HE02 [MW] HE03 [MW] HE04 [MW] HE05 [MW] HE [M]

Forecast Type	Trade Date	SC ID	Resource	Component ID	Interval	HE01 [MW]	HE02 [MW]	HE03 [MW]	HE04 [MW]	HE05 [MW]	HE [M]
Rolling 5MIN	01/20/2023				1	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				2	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				3	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				4	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				5	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				6	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				7	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				8	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				9	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				10	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				11	0.00	0.00	0.00	0.00	0.00	
Rolling 5MIN	01/20/2023				12	0.00	0.00	0.00	0.00	0.00	

Displays 5 minute forecast for VER components
Includes Component ID

UPDATED MATERIAL

Day-Ahead Real-Time Post-Market Default Bids Convergence Bidding Forecast

Trade Date: Entity:

Variable Energy Resource Forecast

Forecast Type Trade Date SC ID Resource

Forecast Type	Trade Date	SC ID	Resource
Day-Ahead	07/29/2022		
Day-Ahead	07/30/2022		
Day-Ahead	07/31/2022		
Day-Ahead	08/01/2022		
Day-Ahead	08/02/2022		
Day-Ahead	08/03/2022		
Day-Ahead	08/04/2022		


Forecast Type:




- Day-Ahead
- Locked Hour-Ahead
- Rolling Hour-Ahead

HE11 [MW]	HE12 [MW]	HE13 [MW]	HE14 [MW]	HE15 [MW]	HE16 [MW]	HE17 [MW]
61.47	62.54	62.93	62.72	62.49	62.26	62.05
62.13	62.22	62.37	61.99	61.47	60.80	60.13
60.05	60.13	59.84	59.05	58.78	58.70	58.62
58.93	61.02	61.60	61.22	60.15	58.88	58.59
60.59	60.95	61.30	61.01	59.93	58.53	58.24
62.26	62.73	63.00	63.00	62.55	61.74	61.45
62.78	62.97	62.98	62.99	62.76	62.25	61.96

Displays forecasts for VER components in various time frames
Includes Component ID column (not shown)

CMRI – ACC Definition

Trade Date: 

Aggregate Capability Constraint Definitions			
  1 - 20 of 84 <input type="text"/> 			
Effective Start Date	Effective End Date	Constraint Name	Resource
06/01/2021	12/31/2030		
06/01/2021	12/31/2030		
06/15/2021	12/31/2030		
06/15/2021	12/31/2030		
07/30/2021	12/31/2030		
08/03/2021	12/31/2030		
08/03/2021	12/31/2030		
08/05/2021	12/31/2030		
08/09/2021	12/31/2030		
08/09/2021	12/31/2030		
08/09/2021	12/31/2030		
08/09/2021	12/31/2030		
08/26/2021	12/31/2030		
08/26/2021	12/31/2030		
08/26/2021	12/31/2030		
08/26/2021	12/31/2030		
08/26/2021	12/31/2030		
08/26/2021	12/31/2030		
08/26/2021	12/31/2030		
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08/26/2021	12/31/2030		
08/26/2021	12/31/2030		

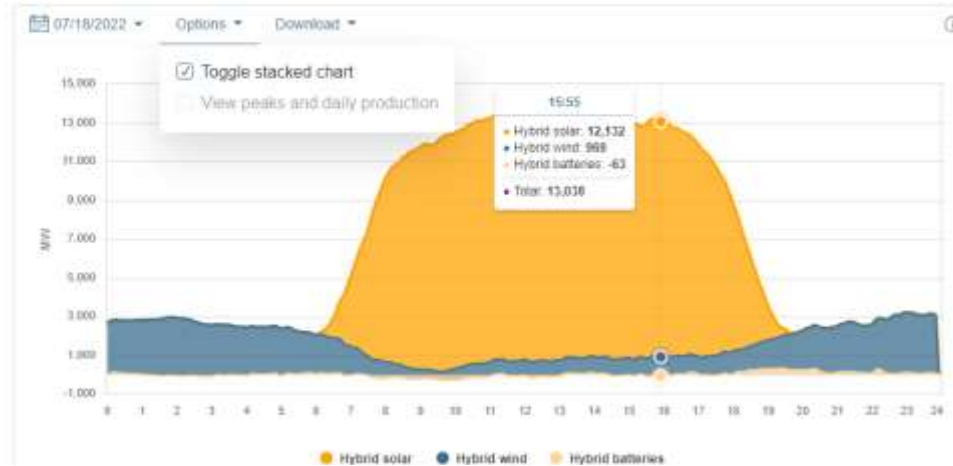
Report Generated: 12/30/2022 10:09:36

There will be new hybrid charts in Today's Outlook & ISO Today

NEW MATERIAL

Hybrids trend

Energy in megawatts broken down by hybrid resource in 5-minute increments.



Current hybrids

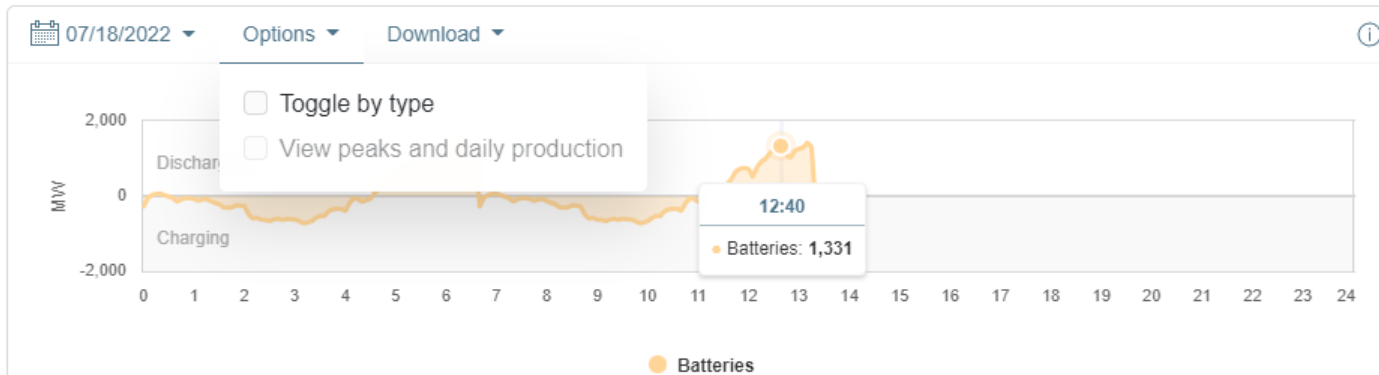


The batteries trend chart also includes the batteries associated with hybrid resources.

NEW MATERIAL

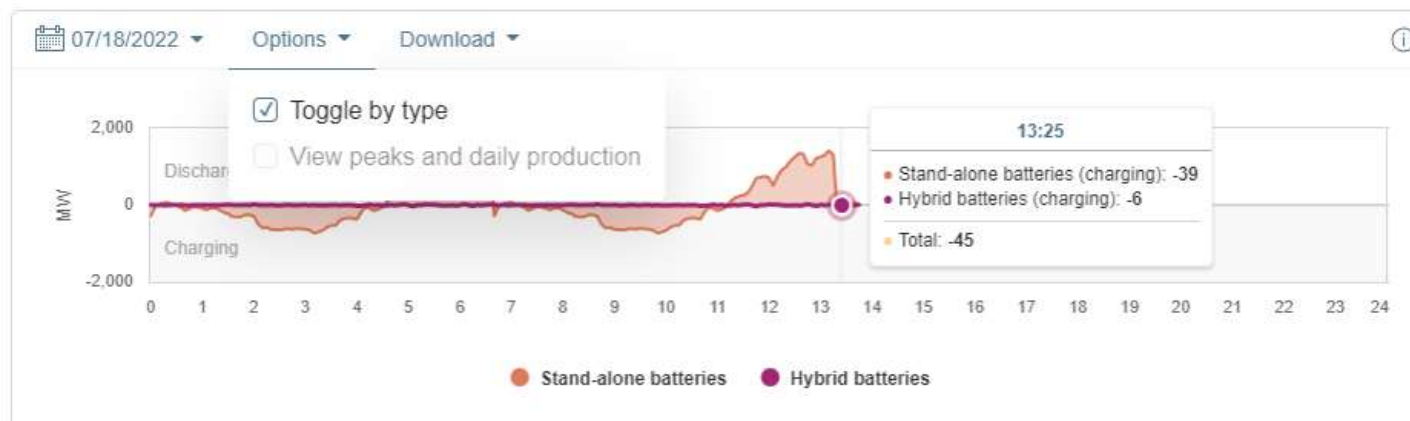
Batteries trend

Energy in megawatts in 5-minute increments. Displays stand-alone storage and some hybrid resources, which includes non-storage resources.



Batteries trend

Energy in megawatts in 5-minute increments. Displays stand-alone storage and some hybrid resources, which includes non-storage resources.



The battery chart may not provide comprehensive battery data when comparing pre- and post- Feb 2023 data.



Pre Feb 1, 2023 chart includes:

- Stand-alone batteries (includes co-located)
- All components of hybrid resources (includes wind, solar, battery or any type of generation)

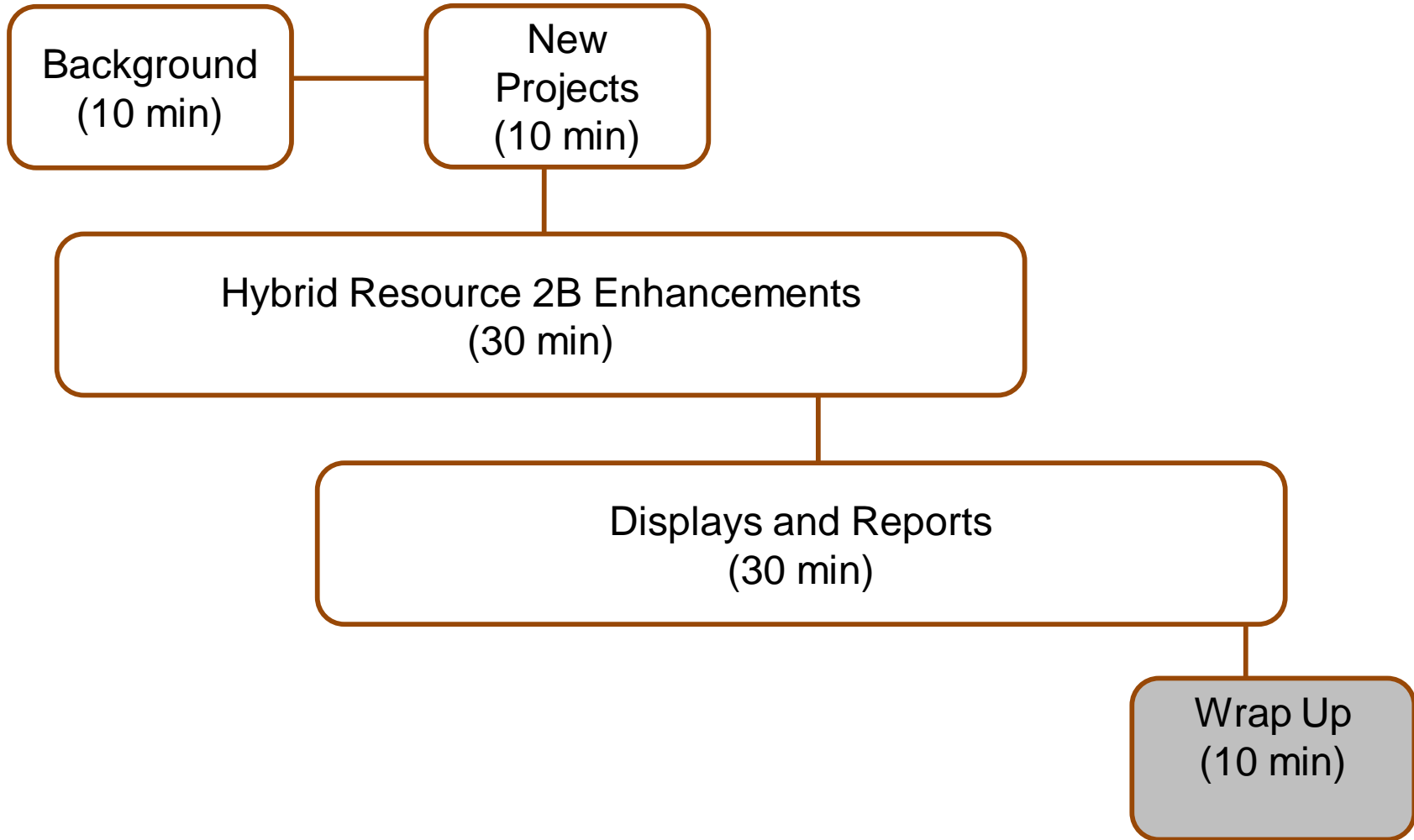
Post Feb 1, 2023 chart includes:

- Stand-alone batteries (includes co-located)
- All components of hybrid resources (includes wind, solar, battery or any type of generation) that are not providing component level telemetry yet

NEW
MATERIAL

Q&A

In today's session we'll cover:



Summary of Hybrid Resource 2B changes

- Interconnection
 - Interconnection Request
 - Project Details Form
 - Generator Resource Data Template
- New Master and Sub-ACC Configuration
- SC Forecast Option
- Submit Dynamic Limits
- BAAOP Displays
- New and Updated Reports
 - OASIS
 - CMRI
 - Transmission Limits
 - ISO Today/Today's Outlook

Coming Soon!
BRS Version 1.7

Final Q&A



Thank you for your participation!

For more detailed information on anything presented, please
visit our website at:

www.caiso.com

Or send an email to:
CustomerTraining@caiso.com