



Combined Cycle Generation Resources



2026_07 CCGRs



Greetings
and
Introductions

Attendance

Questions

Presentation materials

Recording for internal purposes



PROTOCOL DISCLAIMER

This presentation provides a general overview of the Texas Nodal Market and is not intended to be a substitute for the ERCOT Protocols, as amended from time to time. If any conflict exists between this presentation and the ERCOT Protocols, the ERCOT Protocols shall control in all respects.

For more information, please visit:

<http://www.ercot.com/mktrules/nprotocols/>

Purpose	Format	Title
Pre-requisite	WBT	✓ Resources in ERCOT
		✓ Resource Responsibilities in ERCOT
Core Courses	ILT	✓ Resources in ERCOT Market Operations
		✓ Energy Storage Resources
		✓ Intermittent Renewable Resources
		✓ Combined Cycle Generation Resources
Post-requisite	WBT	✓ IRR Forecasting
		✓ Quick Start Generation Resources

Topics in this module include:

1

CCGR Operational Requirements

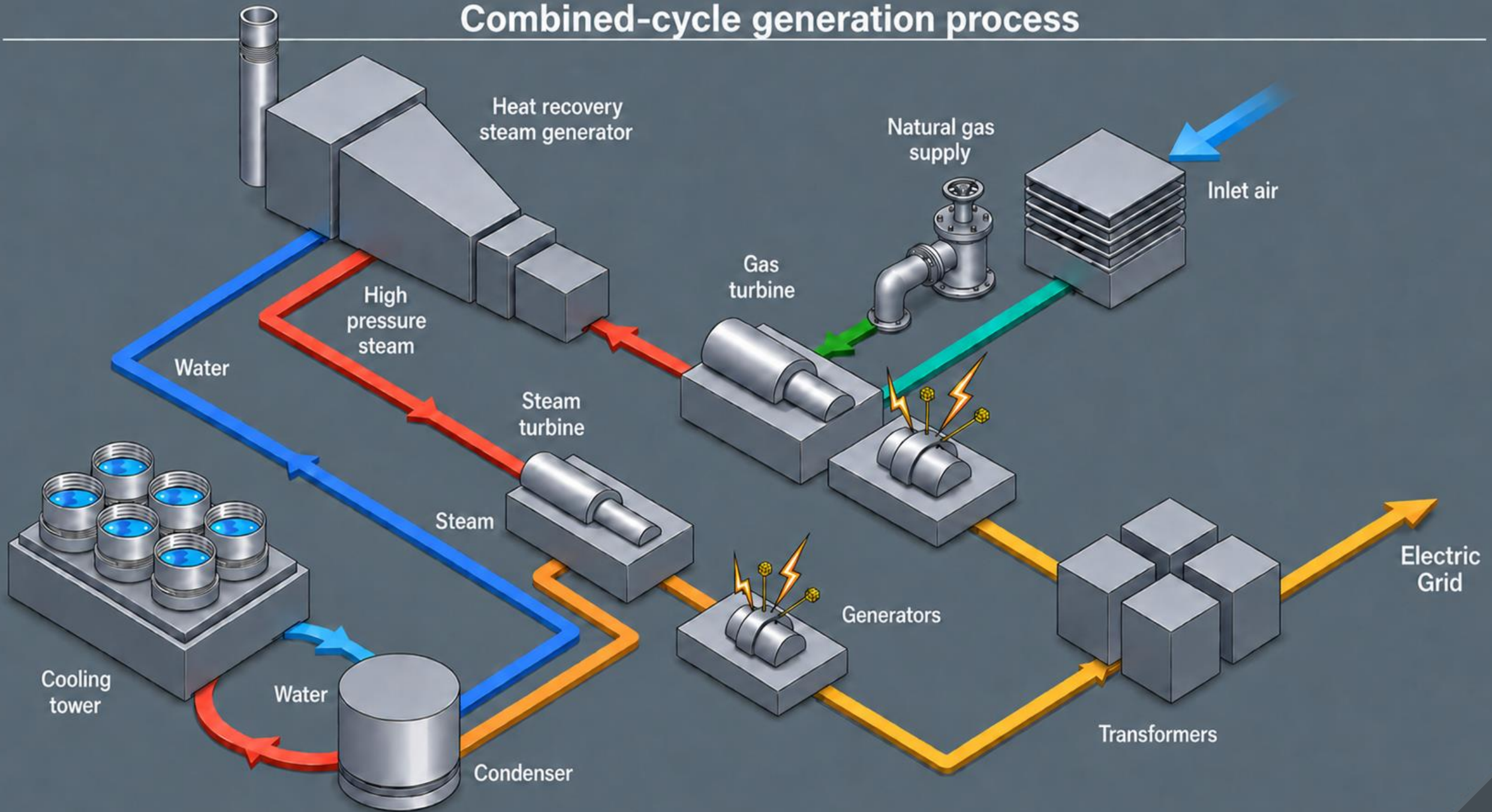
2

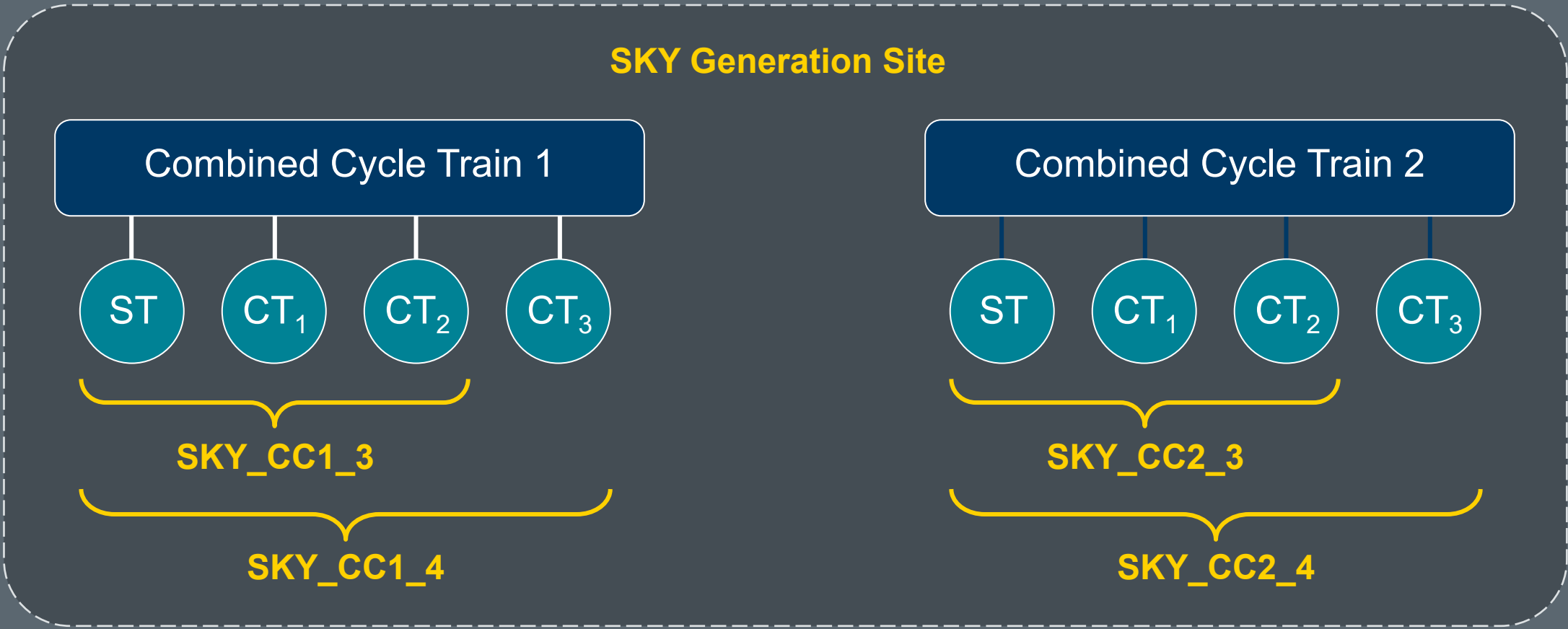
CCGRs in the ERCOT Markets

3

Financial Impacts

Combined-cycle generation process

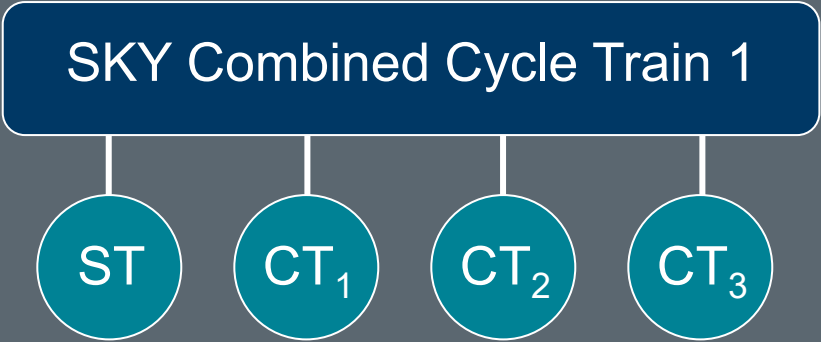




A Combined Cycle Generation Resource
is a registered configuration of a Combined Cycle Train

Resource Entity registers all desired configurations

Configurations		Configuration Codes			
		SKY_CC1_1	SKY_CC1_2	SKY_CC1_3	SKY_CC1_4
Units Included	CT ₁	X	X	X	X
	CT ₂	Alt	Alt	X	X
	CT ₃	Alt	Alt	Alt	X
	ST		X	X	X



Resource Entity must also provide Transition Matrix

Allowable Transitions		To Configuration				
		Offline	SKY_CC1_1	SKY_CC1_2	SKY_CC1_3	SKY_CC1_4
From Configuration	Offline		X	X		
	SKY_CC1_1	X		X	X	
	SKY_CC1_2	X	X		X	X
	SKY_CC1_3		X	X		X
	SKY_CC1_4			X	X	

ERCOT is only allowed to use one configuration per hour



QSE submits COP for each registered CCGR

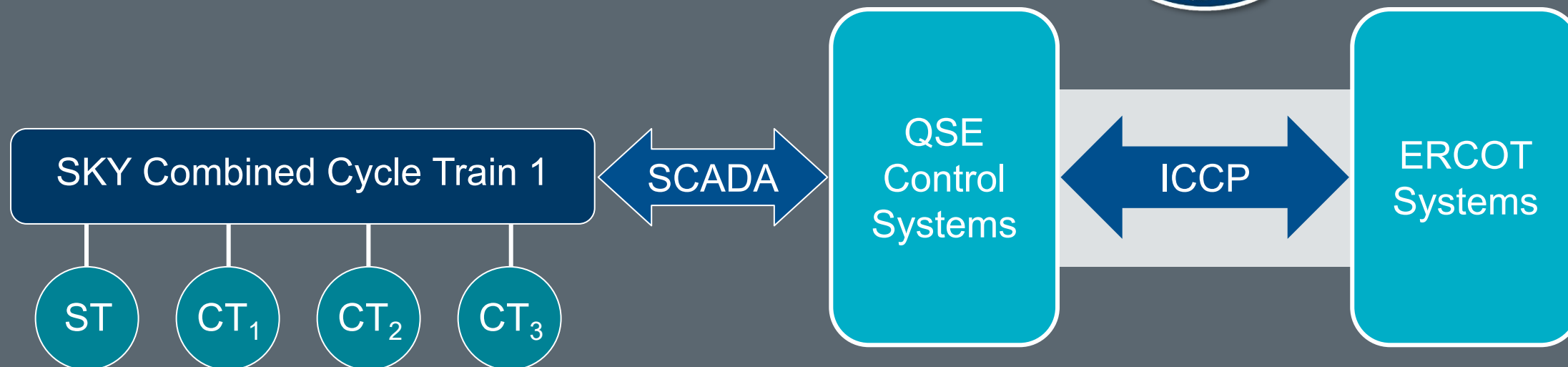
Current Operating Plan												
Resource Name	Resource Status	Resource Limits				Ancillary Service Capabilities						
		HEL	HSL	LSL	LEL	Reg-Up	Reg-Dn	RRSPF	RRSFF	RRSUF	ECRS	NSRS
SKY_CC1_1	OFF	110	100	50	50	0	0	20	0	0	20	0
SKY_CC1_2	ON	165	150	75	75	0	0	30	0	0	30	0
SKY_CC1_3	OFF	330	300	150	150	0	0	60	0	0	60	0
SKY_CC1_4	OFF	495	450	225	225	0	0	90	0	0	90	0

Only one CCGR from a Combined Cycle Train may be shown as on-line during a given hour



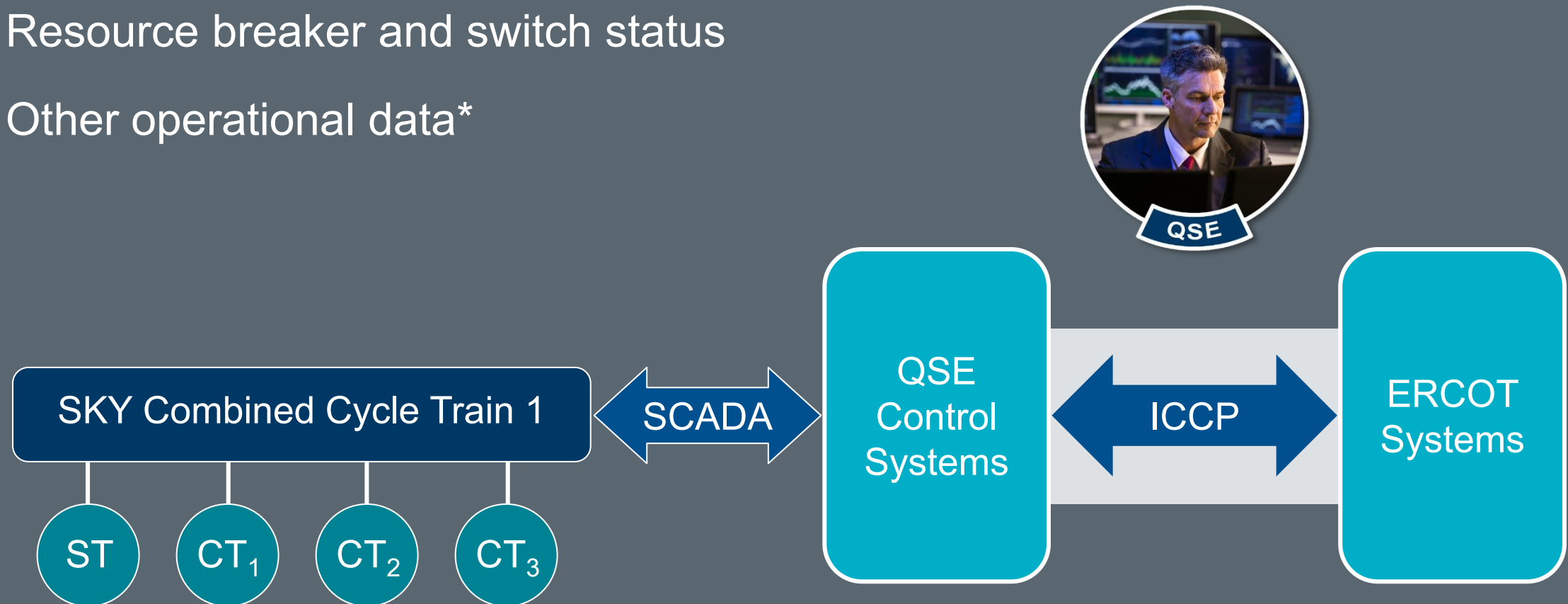
QSE provides telemetry at the train level

- Configuration Number (1, 2, 3, 4, etc)
- Resource Limits for configuration
- Ramp Rates for configuration
- Ancillary Service Capabilities



... and also at the individual turbine level

- Power output (MW and MVAR)
- Resource breaker and switch status
- Other operational data*



* See ICCP Handbook for details

Topics in this module include:

1

CCGR Operational Requirements

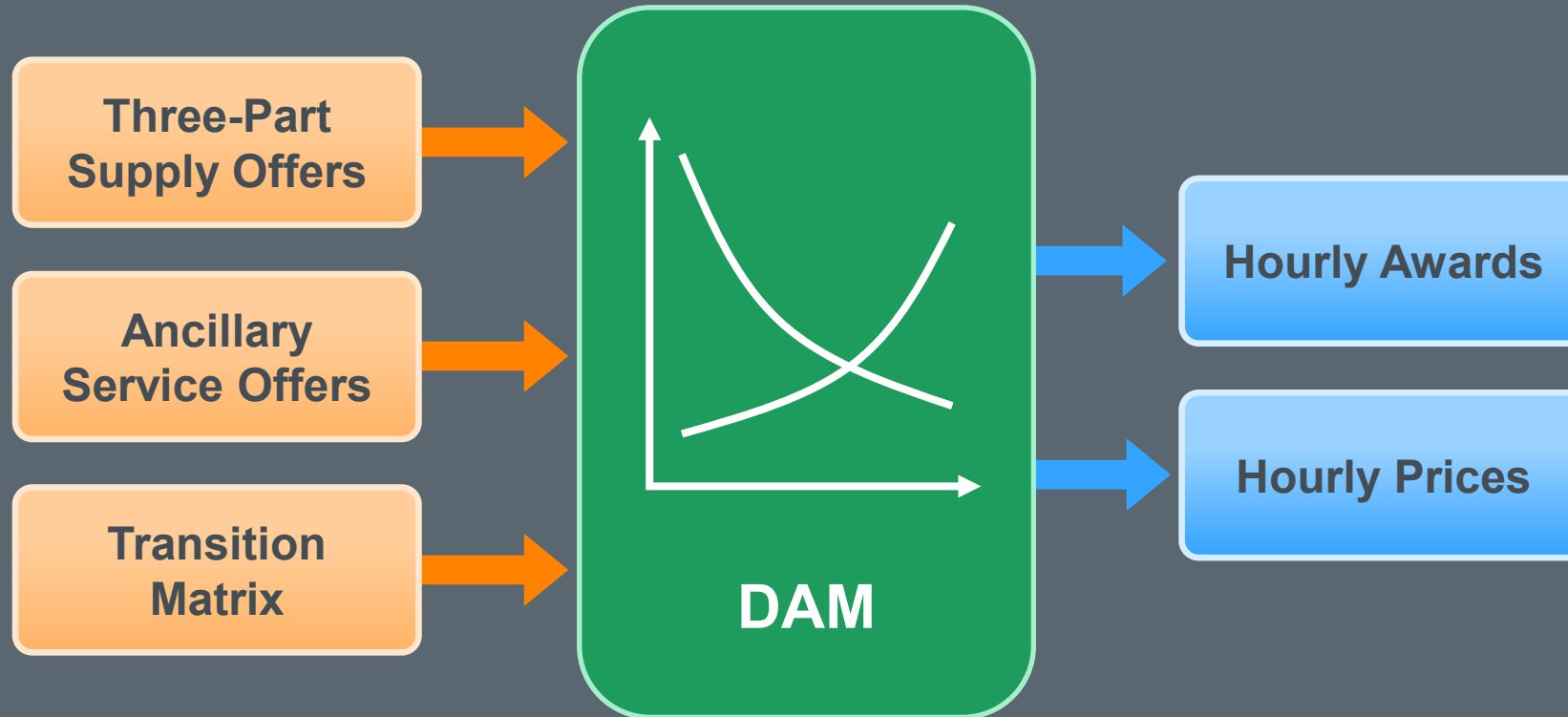
2

CCGRs in the ERCOT Markets

3

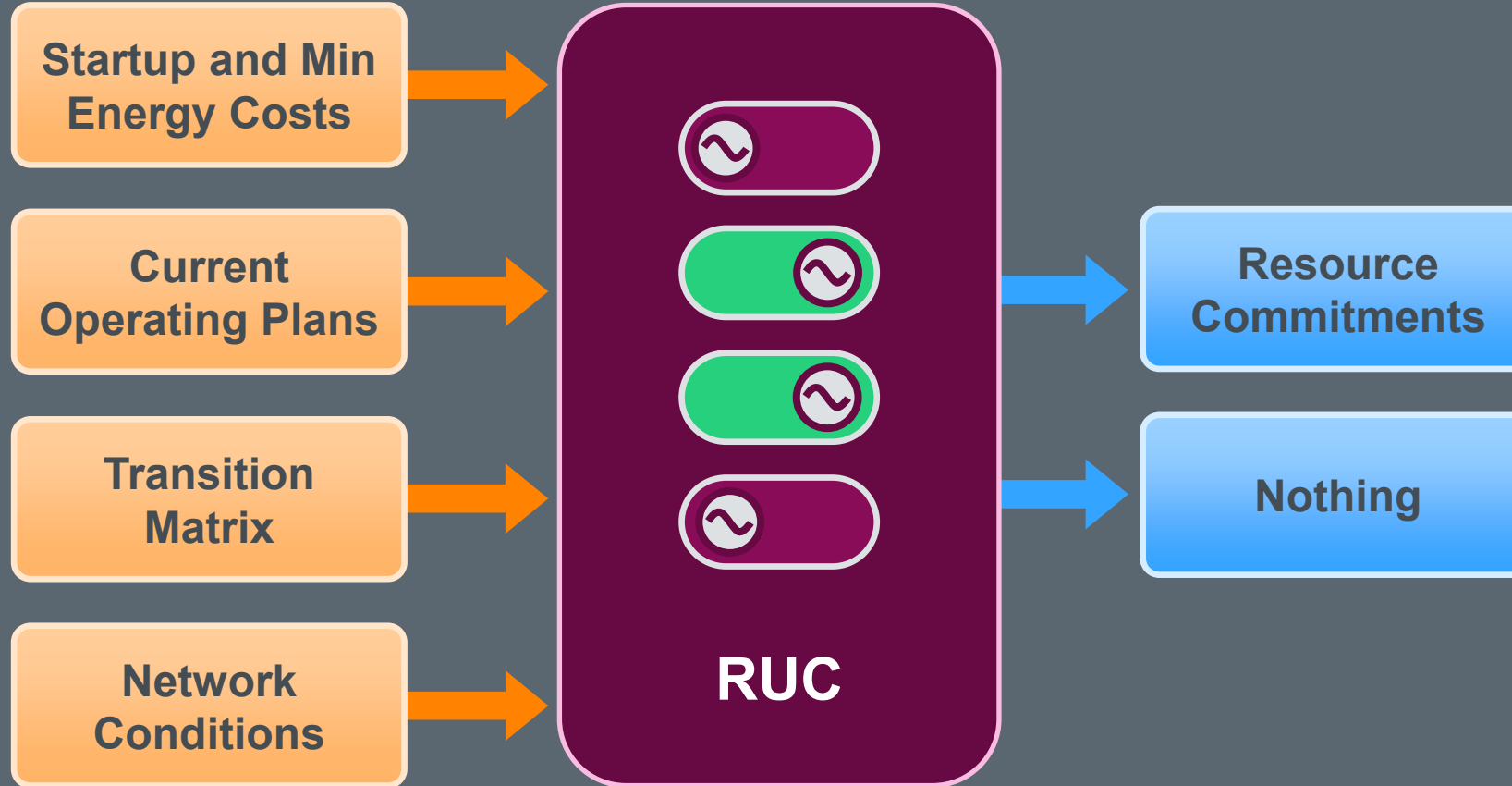
Financial Impacts

QSE may offer all configurations



DAM may start and transition by hour

RUC sees all configurations



May start or transition for uncommitted hours

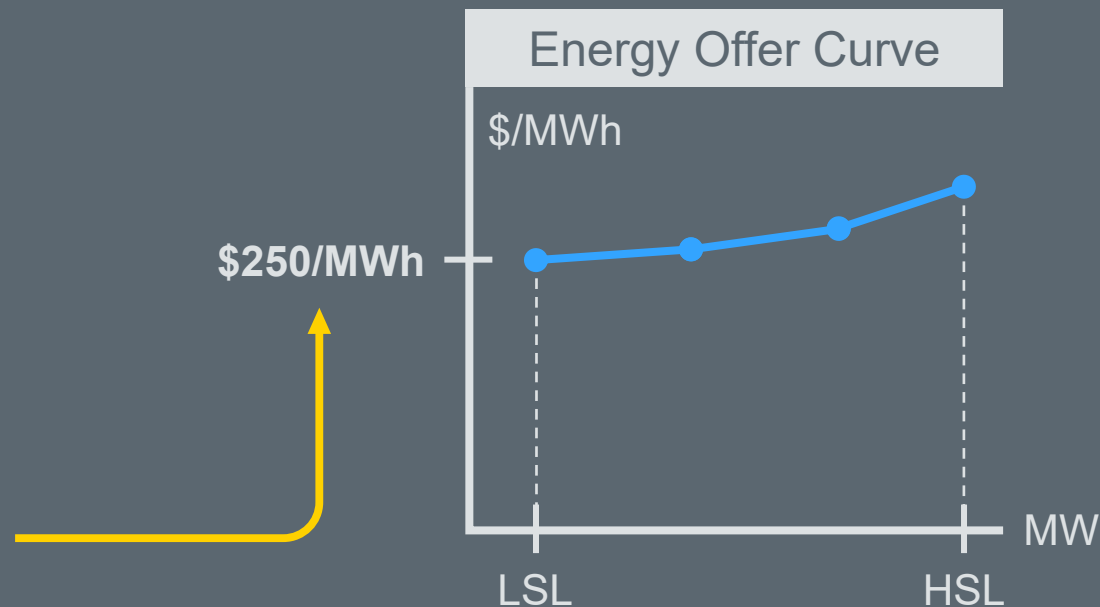
QSE must update COP within 60 minutes

Current Operating Plan												
Resource Name	Resource Status	Resource Limits				Ancillary Service Capabilities						
		HEL	HSL	LSL	LEL	Reg-Up	Reg-Dn	RRSPF	RRSFF	RRSUF	ECRS	NSRS
SKY_CC1_1	OFF	110	100	50	50	0	0	20	0	0	20	0
SKY_CC1_2	OFF	165	150	75	75	0	0	30	0	0	30	0
SKY_CC1_3	OFF	330	300	150	150	0	0	60	0	0	60	0
SKY_CC1_4	OFF	495	450	225	225	0	0	90	0	0	90	0
ONRUC ONOPTOUT												

Resource Financial Impacts

- Floor price
- RUC Settlement
 - Make-Whole
 - Clawback

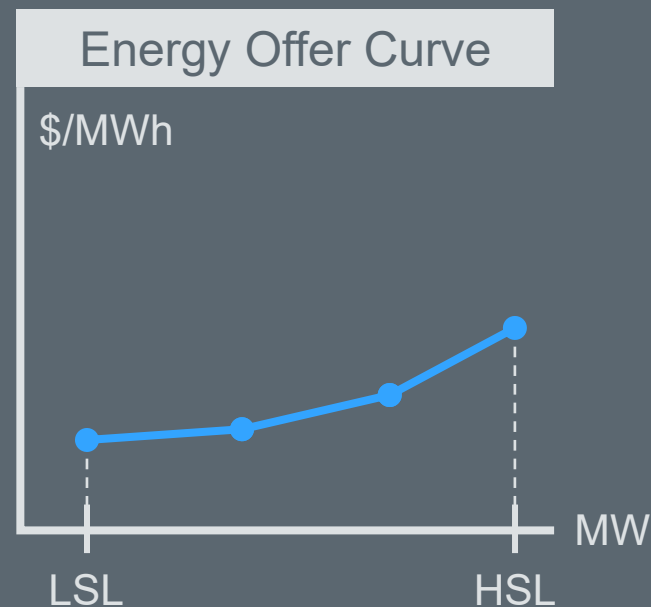
ERCOT adjusts
if QSE does not



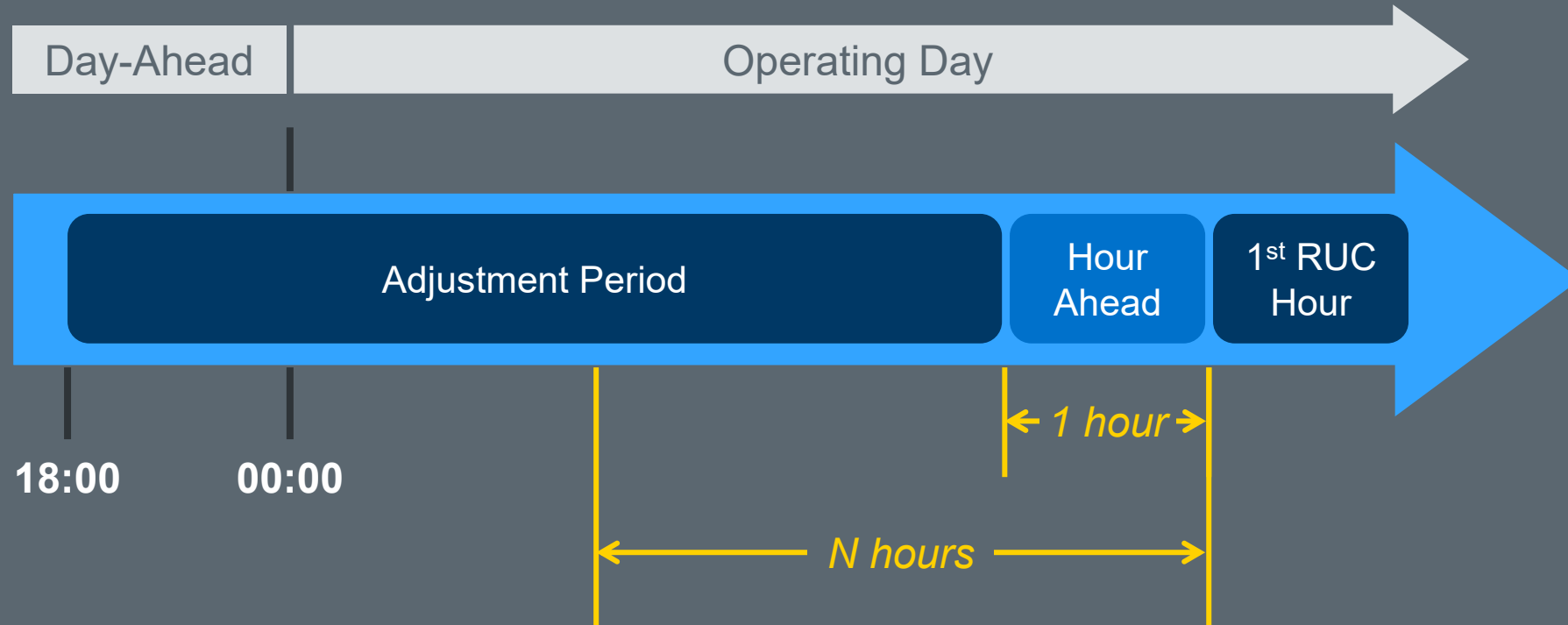
Resource Financial Impacts

- No floor price
- No RUC Settlement

QSE must update COP prior to
Opt Out Snapshot



Taken at the earlier of:

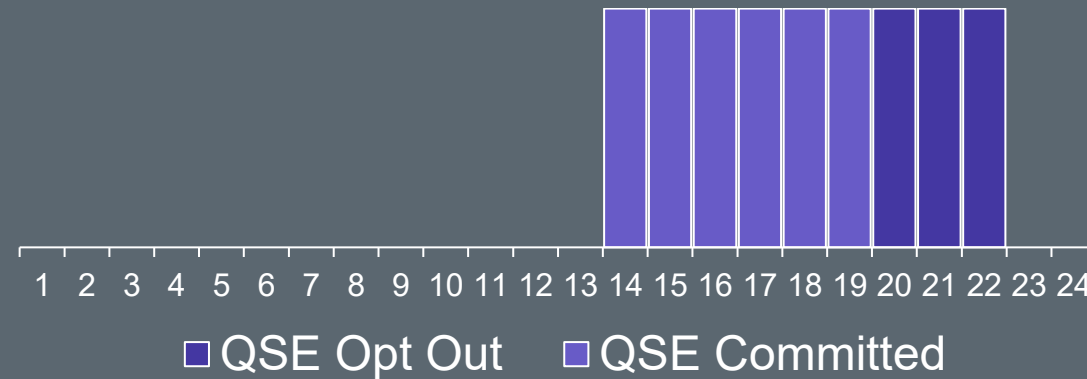


**Where N is Start Time of
RUC-Committed configuration**

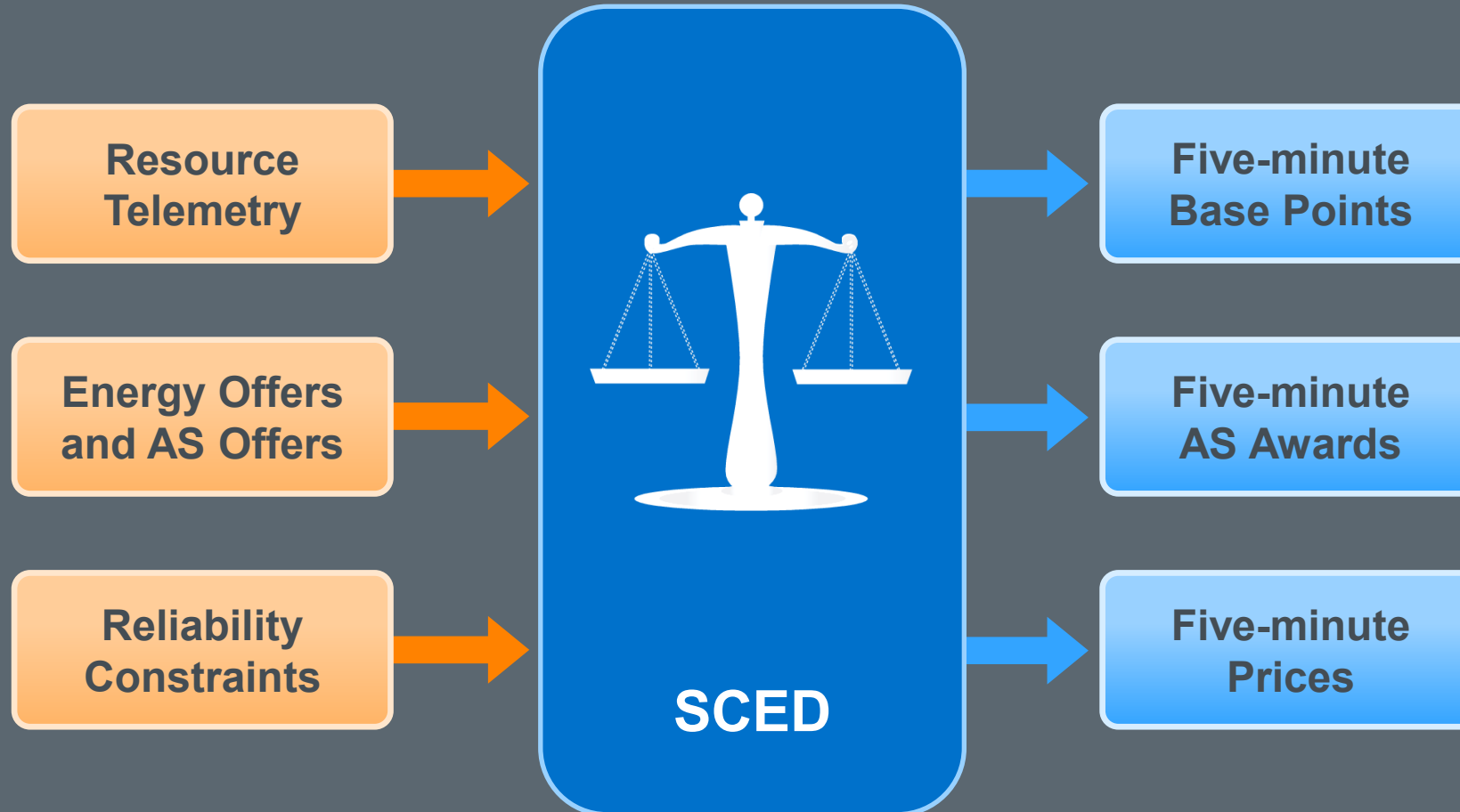


QSE opts out at the train level

- QSE initially commits SKY_CC1_2
- RUC extends commitment by transition to SKY_CC1_1
- QSE Opts Out with SKY_CC1_2



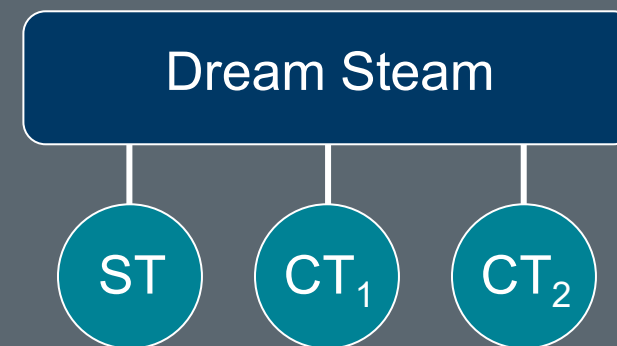
Dispatches / awards only current configuration





“Dream Steam” is a registered Combined Cycle Train

Configurations		Configuration Codes		
		DS_CC1_1	DS_CC1_2	DS_CC1_3
Units Included	CT ₁	X	X	X
	CT ₂	Alt	Alt	X
	ST		X	X



Allowable Transitions		To Configuration			
		Offline	DS_CC1_1	DS_CC1_2	DS_CC1_3
From Configuration	Offline		X		
	DS_CC1_1	X		X	
	DS_CC1_2		X		X
	DS_CC1_3			X	

Can DAM start CT₁ for Hours 5-8 and then start the CT₂ and ST units in Hour 9?

If all configurations are planned to be OFF during Hours 18-24, can RUC start the CT₁, CT₂ and ST units in Hour 18?

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1

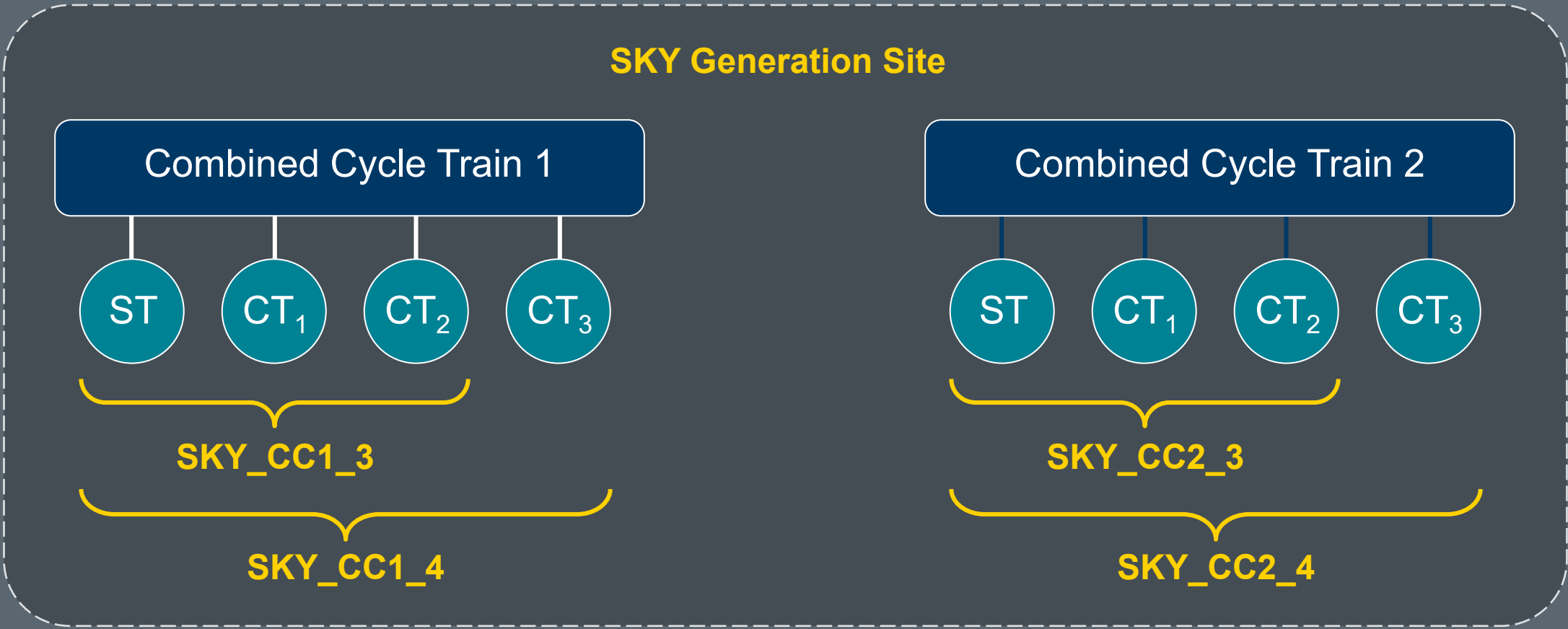
CCGR Operational Requirements

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CCGRs in the ERCOT Markets

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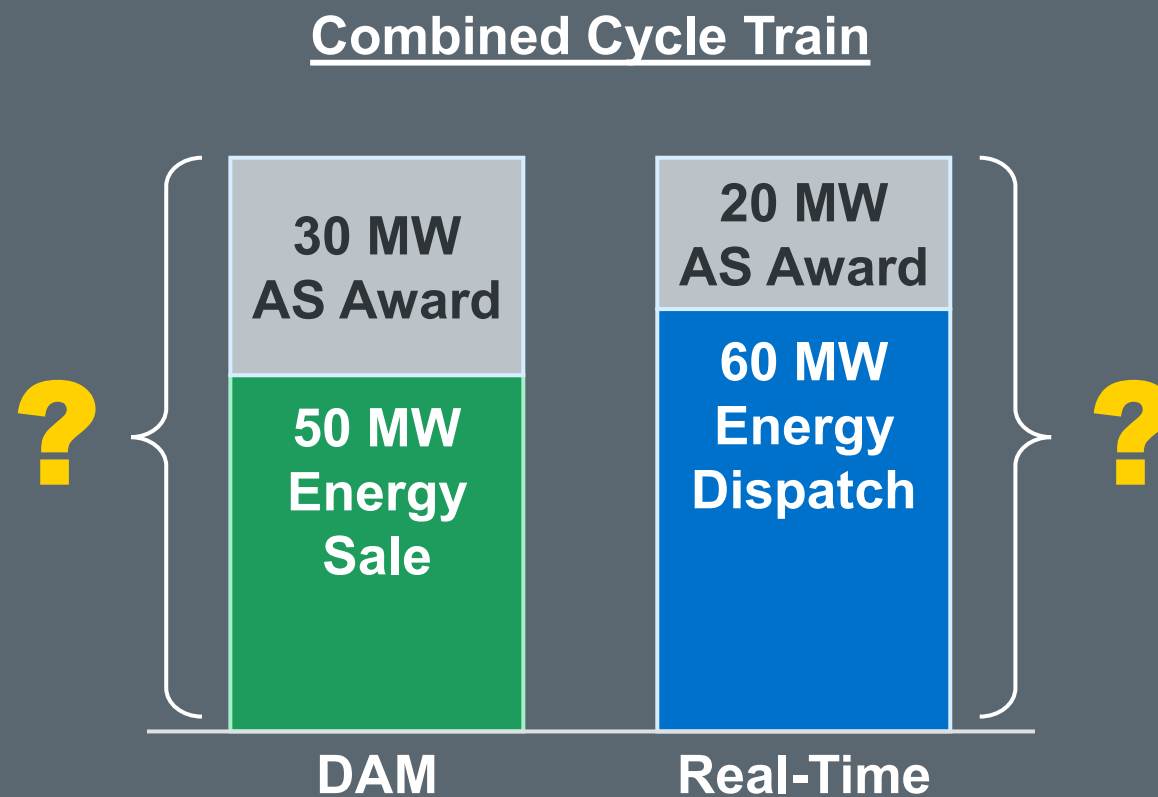
Financial Impacts



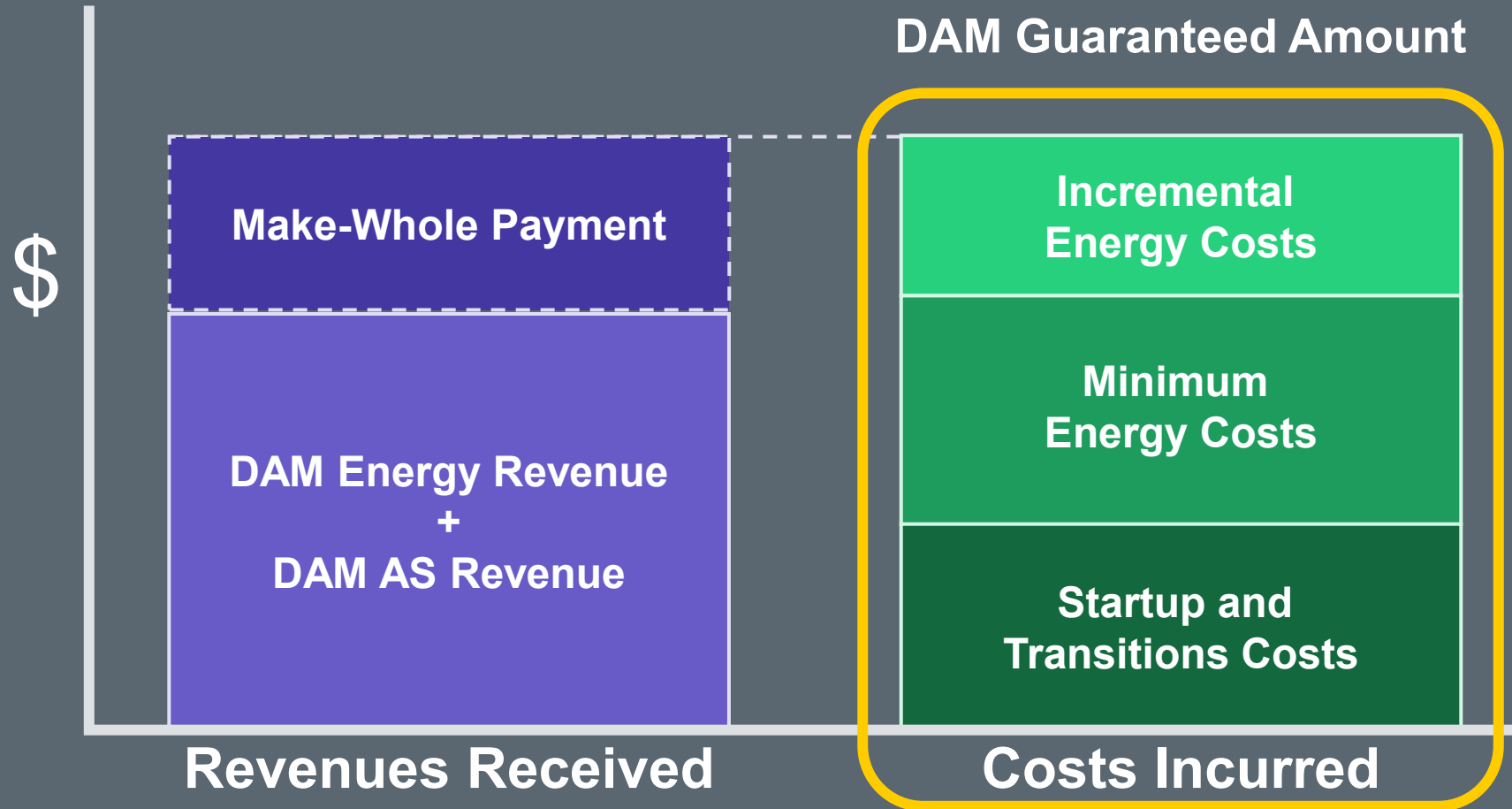
All Combined Cycle Generation Resources
are settled at the train level



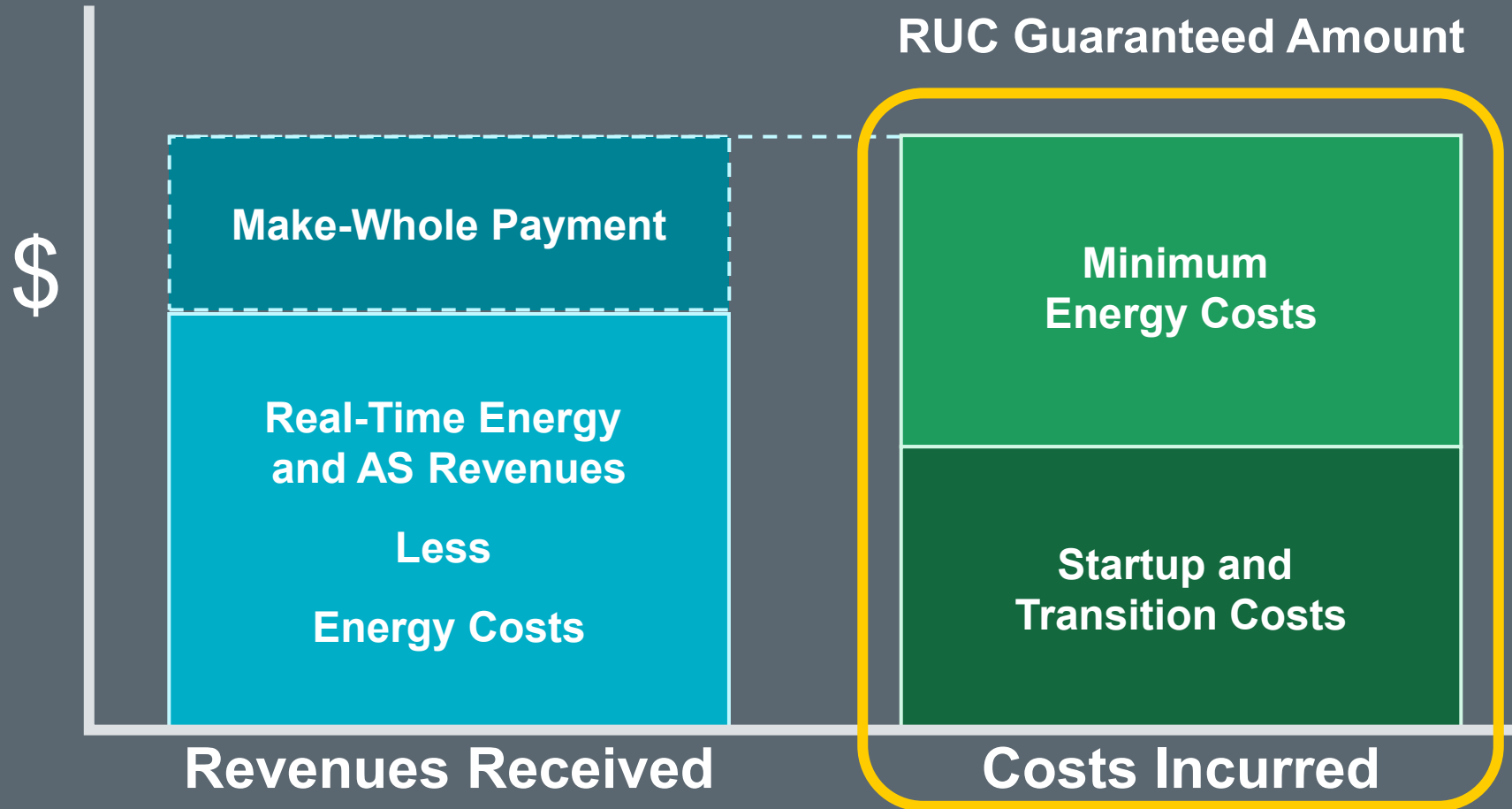
QSE has transactions for their Resource



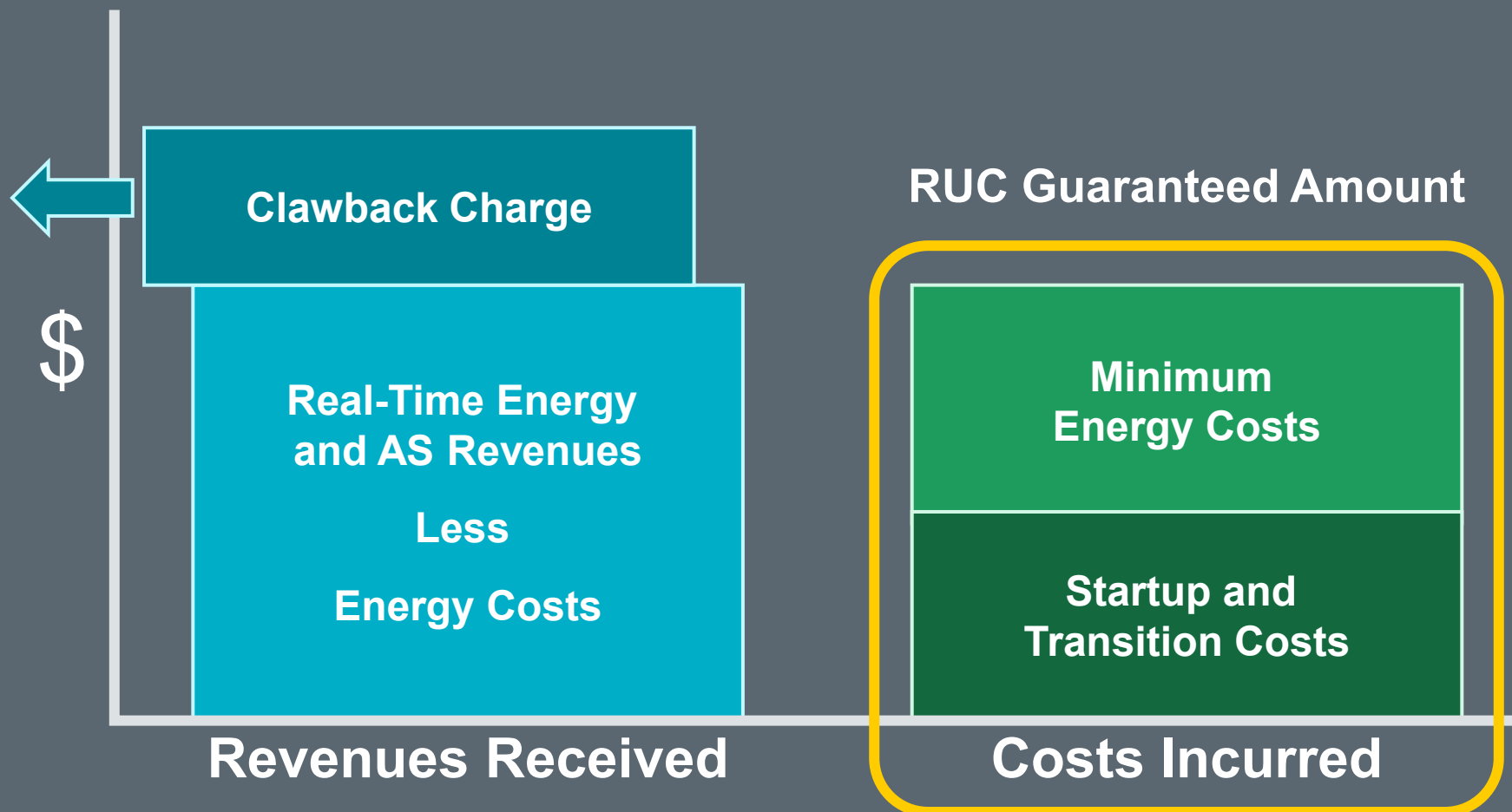
If revenues are less than costs



When revenues are less than costs



When revenues are greater than costs



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