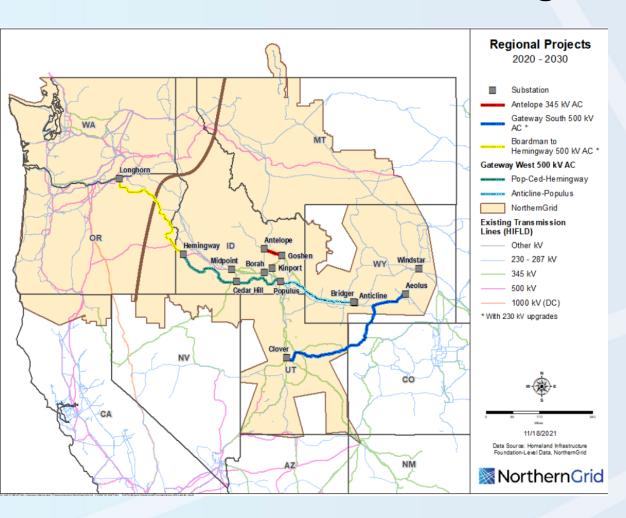






What has changed from the last cycle?



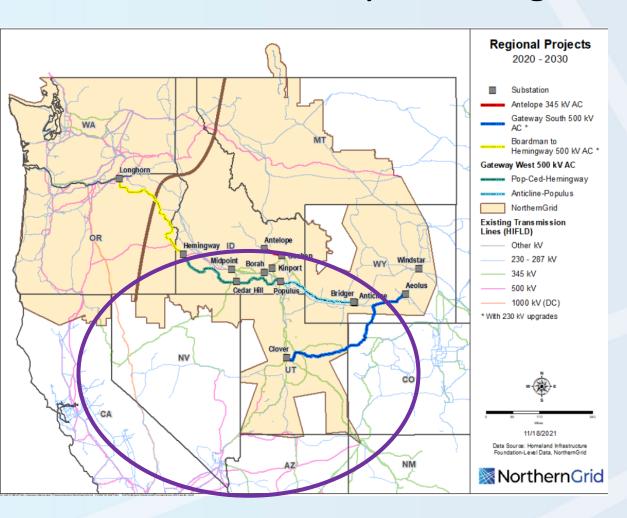
Regional Projects 2032 Boardman to Hemingway 500 Greenlink North 500 kv AC Montana-Alberta Tie Line 230 One Nevada (ON) #2 500 kV Midpoint-Cedar Hill Anticline-Populus Cascade Crossing 320 kV AC Clover - Robinson Cross-Tie Loco Falls 230 kV AC SWIP-North 500 kV AC Cedar Hill Substation Anticline 345 kV 500 kV 1000 kV (DC) * With 230 kV upgrades 9/14/2022 Data Source: Homeland Infrastructure Foundation-Level Data, NorthernGrid NorthernGrid

Final 2030 Regional Transmission Plan

Projects under consideration for 2032 Regional Transmission Plan



Inter-Cycle Change: Addition of NV Energy



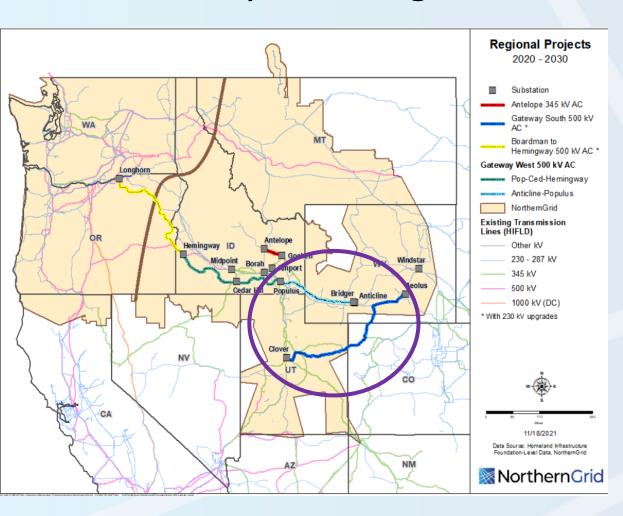
Regional Projects 2032 Boardman to Hemingway 500 Greenlink North 500 kv AC Montana-Alberta Tie Line 230 One Nevada (ON) #2 500 kV Midpoint-Cedar Hill Anticline-Populus Cascade Crossing 320 kV AC Clover - Robinson Cross-Tie Loco Falls 230 kV AC SWIP-North 500 kV AC Cedar Hill Substation Anticline 345 kV 500 kV 1000 kV (DC) * With 230 kV upgrades 9/14/2022 Data Source: Homeland Infrastructure Foundation-Level Data, NorthernGrid NorthernGrid

Final 2030 Regional Transmission Plan

Projects under consideration for 2032 Regional Transmission Plan



Inter-Cycle Change: Clover-Aeolus under construction



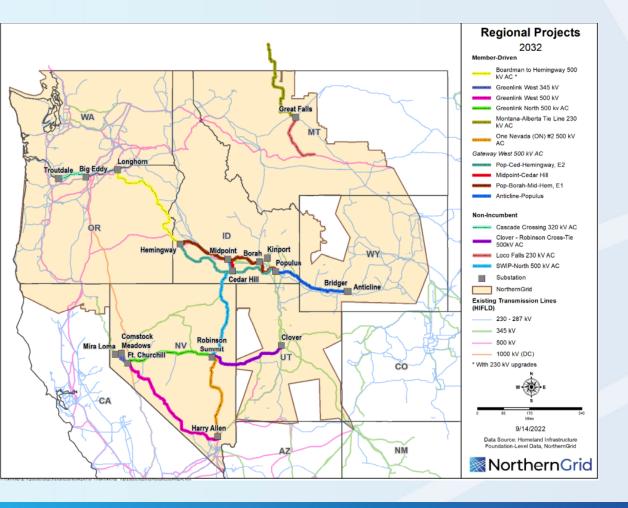
Regional Projects 2032 Boardman to Hemingway 500 Greenlink North 500 kv AC Montana-Alberta Tie Line 230 Midpoint-Cedar Hill Anticline-Populus Cascade Crossing 320 kV AC Clover - Robinson Cross-Tie Loco Falls 230 kV AC SWIP-North 500 kV AC Cedar Hill Substation Anticline NorthernGrid 230 - 287 kV 345 kV Robinson 500 kV 1000 kV (DC) * With 230 kV upgrades 9/14/2022 Data Source: Homeland Infrastructure Foundation-Level Data, NorthernGrid NorthernGrid

Final 2030 Regional Transmission Plan

Projects under consideration for 2032 Regional Transmission Plan



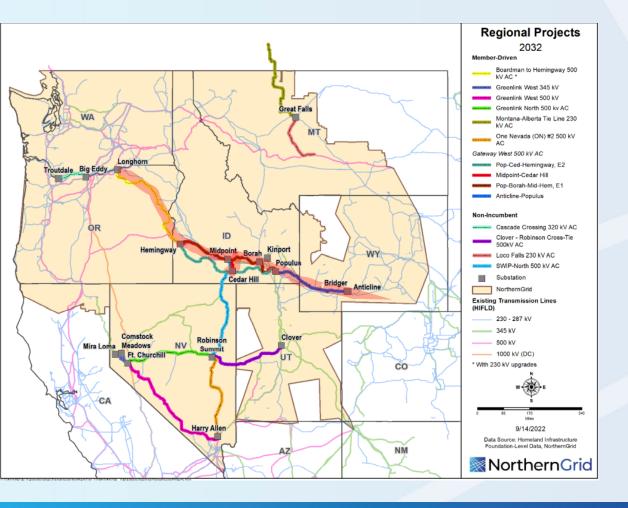
Regional Transmission Plan



201			-				9 (
RC Name			GWW: Windstar -Shirley	_	-						
		em	-Š	GWW E1: Pop-Bor	GWW E2: Pop-Ced		3		_	100	
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	Cascade	mai	spi	=	-	ON#2	=	-SS	Z	O F	MATL
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		Bog	ä	§	3		5		S		
			5	0	9						
BLMP – Baseline Member Projects		X	X	х	X	Х	Х				х
BLNP – Baseline No Projects							1			1	
RC1	х										
RC2		х									
RC3		,,	х								
RC4			1	1	х		1				
RC5						х					
RC6							х				
RC7								х			
RC8									x		
RC9			1 1				i i			1	х
RC10 ("Bugatti")	х	х	x	х	х	х	х	х	х	x	х
RC11		х	х		х		1				
RC12	х	х	x		x						
RC13		х	x		х		1		х		
RC14	х	X	X		x				x		
RC15		X	X	х							
RC16		X	X		X						X
RC17						X	X	Х	х		
RC18							X	X	х		
RC19						Х		Х	х		
RC20						x	X		х		
RC21						X	х	X			
RC22							х	Х			
RC23							Х		Х		
RC24						х	X				
RC25	Х	X					Į.				
RC26										X	X

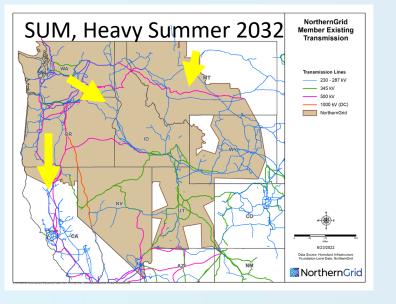


Regional Transmission Plan



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RC Name			ley			۵.	30		-		
West and the		Ε	GWW: Windstar -Shirley	GWW E1: Pop-Bor	GWW E2: Pop-Ced		_				
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	Cascade	튣	ju		E2:	ON#2	Ë	Cross-tie	SWIP-North	Loco Falls	MATL
	٥	Boardman-Hem	3	₹	≥	122	Greenlink N,W	0	S	3	
		m	Ž	8	8		0				
			8								
BLMP – Baseline Member Projects		х	х	х	х	х	х				x
BLNP – Baseline No Projects											
RC1	х										
RC2		X									
RC3			x								
RC4					х						
RC5						х					
RC6							X				
RC7								X			
RC8									X		
RC9										1 1	X
RC10 ("Bugatti")	X	X	X	х	х	X	X	X	X	X	x
RC11		X	x		х						
RC12	х	X	x		х						
RC13		Х	х		х	Č.			х		
RC14	X	X	x		x				X		
RC15		X	х	х							
RC16		X	X		х						X
RC17						X	X	х	X		
RC18							X	X	X		
RC19						х		X	X		
RC20						х	X		X		
RC21						х	X	X			
RC22							X	х			
RC23							X		х		
RC24						X	X				
RC25	Х	X									
RC26										X	x







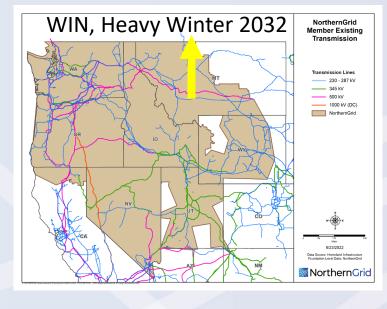
SUM, Heavy Summer 2032

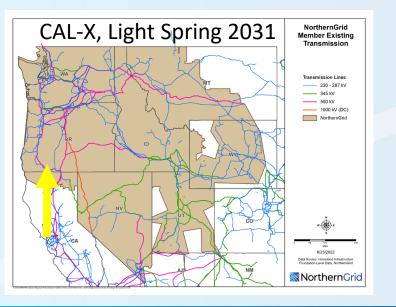
- Southbound Northwest to California
- Eastbound Northwest to Idaho
- Southbound MATL



WIN, Heavy Winter 2032

- Typical seasonal dispatch
- Northbound MATL







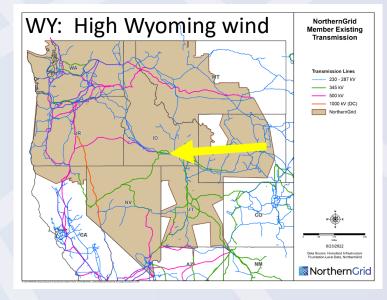
CAL-X, Light Spring 2031

- Northbound California to Northwest
- 2032 loading



WY: High Wyoming wind export case

Export hour from Production Cost Modeling

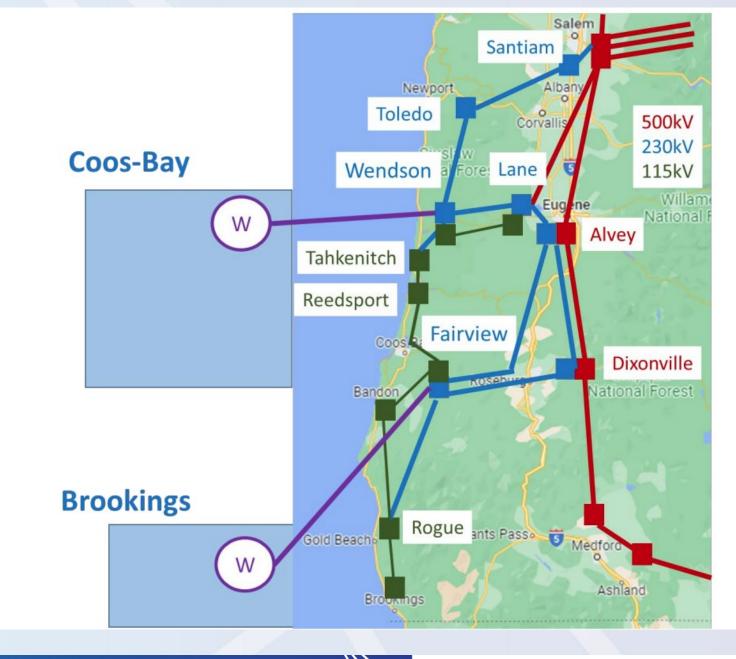




ESR: Offshore Wind

1.2 GW, Wendson 230 kV

1.8 GW, Fairview 230 kV





Offshore Wind: Power Flow

2032 Heavy Summer base case "Stock" Account for NorthernGrid Data submittals

Model in Offshore Wind at maximum output

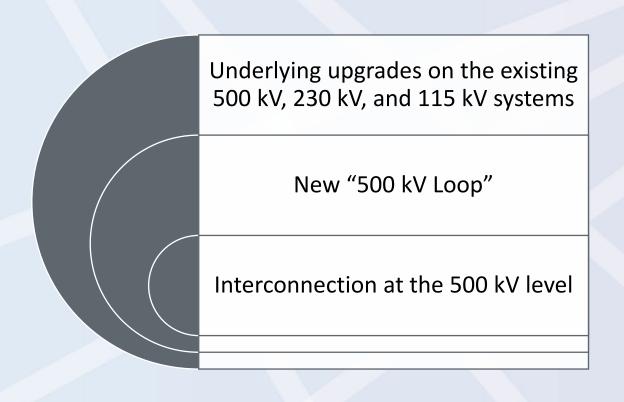
Perform reliability analysis





ESR: Offshore Wind, Initial Findings







Offshore Wind: Production Cost

1. Anchor Data Set

Account for NorthernGrid Data Submittals

Run Production Cost, establish "baseline"

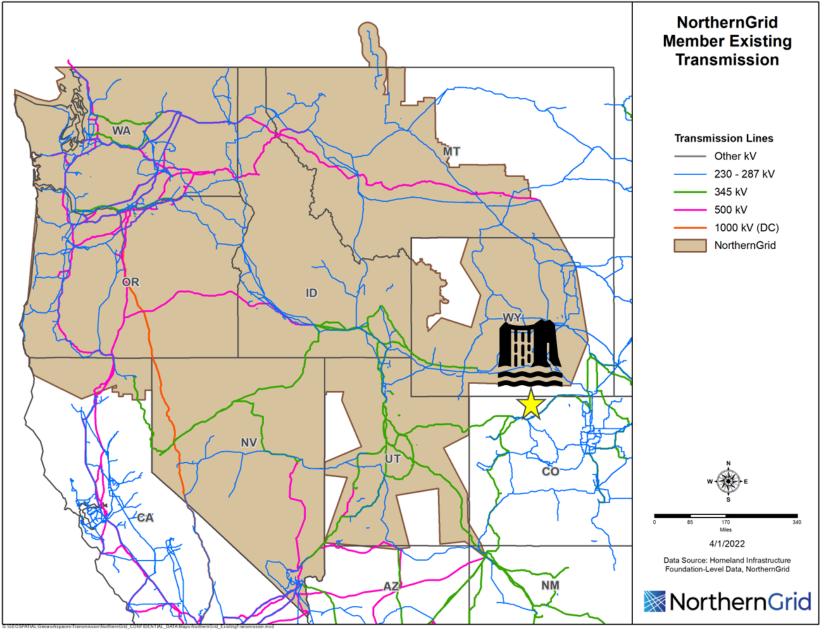
Add in offshore wind and "Transmission Solution"

Run Production Cost, establish changes



Economic Study Request: Pumped Storage Hydro

±900 MW 500 kV Aeolus Substation





Pumped Storage Analysis Approach

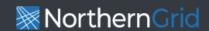
Production Cost Modeling

2032 Anchor Data Set

NorthernGrid Transmission additions



Improved NorthernGrid.net: Subscription Feature



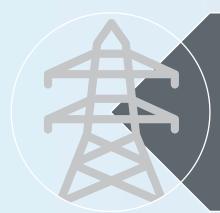
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Quarter 5: Data Submittal Window Open



Updated Loads and Resources



New Request window for 2023 Economic Study Request

