

Table UP-2: ATC Futures - ATC Energy Collaborative - Michigan
January 2, 2009 (ATC Internal Use Only Discussion) (Rev 4.0)

UP Micro-Drivers	Load Assumptions												Generation Assumptions												New Generation in Northern Michigan		
	Demand Growth Within UP (Demand MWs)			Energy Growth Within UP (Energy MWHrs)			Total Point Loads MW added in the UP (2018/2024)			Total UP Growth (2018)	Total UP Growth (2024)	Demand Growth Outside UP (MWs)	Existing UP Generation Profile (Note: U.P. generation on-line only if dictated by merit order dispatch, or unless noted below)			UP Generation Additions			UP Generation retirements			Wind Generation					
	West	Central	East	West	Central	East	West	Central	East	U.P.	U.P.		West	Central	East	West	Central	East	West	Central	East	West	Central	East			
Lower	-0.10%	0.08%	0.10%	-0.10%	0.08%	0.10%	-6 MW	-111 MW	-2 MW	-1.44%	-0.86%	0.5%	Fossil (-69MW Total) 'WP Mine1-2-3 (40) + SM-ST (11) + Warden (18)	Fossil (-151MW Total) 'PI5-6 Derate (40) + ESC1-2 (26) + Neenah-MUN (5)+NP7 Plus (55) + MBLP (25)	9.4MW Diesel Available	5 MW	116 MW	None	None	5MW Diesel	None	PI3-4 (116)	None	Zero	Zero	Zero	Zero
Mid-Lower	0.36%	0.48%	0.40%	0.36%	0.48%	0.40%	No Change	-40 MW	No Change	-0.24%	-0.05%	1.0%	(-51MW Total) 'WP Mine1-2-3 (40) + SM-ST (11)	Fossil (-134MW Total) PI5-6 Derate (40) + ESC 1-2 (26) + Neenah-MUN (5) + MBLP (25) + NP7 (38)		None		None									
Mid	0.73%	0.84%	0.75%	0.73%	0.84%	0.75%	+5 MW	+29 MW	+33 MW	1.14%	0.84%	1.75%	(-40MW Total) 'WP Mine1-2-3 (40)	Fossil (-65MW Total) PI5-6 Derate (40) + MBLP (25)	11.4MW Diesel Available	10MW	29 MW	None	None	5MW Diesel + 24MW Bio Mass	None	None	25MW	50MW	50MW	100MW	
Mid-Upper	1.23%	1.25%	1.25%	1.23%	1.25%	1.25%	+16 / +3	+79 / +20	+35 / +5	2.00%	1.60%	2.0%	Fossil all available	Fossil (-40MW Total) PI 5-6 (40)	11.4MW diesel Available	35MW	93MW	None	None	24MW Bio Mass + 9MW Hydro + 60 MW Mascoma	None	None	50MW	100MW	100MW		
Upper	1.93%	2.00%	2.00%	1.93%	2.00%	2.00%	+19 / +22	+134 / +50	+46 / +10	3.00%	2.58%	3.0%	Fossil all available	Fossil all available	16MW Diesel Available	50MW	101 MW	None	None	8MW Diesel + 24MW Bio Mass + 9MW Hydro + 60 MW Mascoma	None	PI3-4 (116) +GLAD (22)	100MW	200MW	200MW	600MW	

2018 Futures Descriptions

Robust Economy	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	-0MW	-0MW	20MW Hydro	(none)	35MW	(+101 MW)	(none)	(-116 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	(+ 600 MW)
High Retirements	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	-69MW	-151MW	32MW Hydro	(none)	(none)	(+29MW)	(none)	(-138 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	(+ 600 MW)
High Environmental	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	-51MW	-134MW	20MW Hydro	(none)	(none)	(+5 MW)	(none)	(-116 MW)	(none)	(+50 MW)	(+100 MW)	(+100 MW)	(none)
Slow Growth	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	-40MW	-65MW	44MW Hydro	(none)	10MW	(+5 MW)	(none)	(-116 MW)	(none)	(+100 MW)	(+200 MW)	(+200 MW)	(none)
DOE 20% Wind	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	-69MW	-151MW	20MW Hydro	(none)	(none)	(+93 MW)	(none)	(-138 MW)	(none)	(+100 MW)	(+200 MW)	(+200 MW)	(+ 100 MW) (Wind)
Fuel and Investment Limitations	Mid	Mid	Mid	Mid	Mid	Mid	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	-40MW	-65MW	0MW Hydro	(none)	10MW	(+5 MW)	(none)	(-116 MW)	(none)	(none)	(none)	(none)	(none)

2024 Futures Descriptions

Robust Economy	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	Upper	-0MW	-0MW	20MW Hydro	(none)	50MW	(+101 MW)	(none)	(-116 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	(+ 600 MW)
High Retirements	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	-69MW	-151MW	32MW Hydro	(none)	(none)	(+29MW)	(none)	(-138 MW)	(none)	(+25 MW)	(+50 MW)	(+50 MW)	(+ 600 MW)
High Environmental	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	-51MW	-134MW	20MW Hydro	(none)	(none)	(+5 MW)	(none)	(-116 MW)	(none)	(+50 MW)	(+100 MW)	(+100 MW)	(none)
Slow Growth	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	Lower	-40MW	-65MW	44MW Hydro	(none)	10MW	(+5 MW)	(none)	(-116 MW)	(none)	(+100 MW)	(+200 MW)	(+200 MW)	(none)
DOE 20% Wind	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	Mid-Upper	-69MW	-151MW	20MW Hydro	(none)	(none)	(+93 MW)	(none)	(-138 MW)	(none)	(+100 MW)	(+200 MW)	(+200 MW)	(+ 100 MW) (Wind)
Fuel and Investment Limitations	Mid	Mid	Mid	Mid	Mid	Mid	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	Mid-Lower	-40MW	-65MW	0MW Hydro	(none)	10MW	(+5 MW)	(none)	(-116 MW)	(none)	(none)	(none)	(none)	(none)

Table UP-3: U.P. Futures High Level Summary, Western/Central/Eastern U.P. Zones

MISO Future	Load Growth Outside ATC	Western U.P. Future	Scalable Load Growth	Point Load Changes	Generation Additions	Generation Retirements	Existing Generation	Wind Gen. Additions	Rogers City Generation	Western U.P. System Summary
Reference	Upper	Robust Economy	Upper	Upper	None	None	Upper	+25 MW	Upper	Large increase in western U.P. import
Environmental	Mid	High Retirements	Mid	Mid	None	None	Lower	+25 MW	Upper	Large increase in western U.P. import
Environmental	Mid-Lower	High Environmental	Mid-Lower	Mid-Lower	None	None	Mid-Lower	+50 MW	Lower	Modest generation/load balance issues
Reference	Lower	Slow Growth	Lower	Lower	None	None	Mid	+100 MW	Lower	Modest generation/load balance issues
20% Wind	Mid-Upper	DOE 20% Wind	Mid-Upper	Mid-Upper	None	None	Lower	+100 MW	Mid	Large increase in western U.P. import
Investment Limitation	Mid-Lower	Fuel & Inv. Limitations	Mid	Mid-Lower	None	None	Mid	None	Lower	Modest generation/load balance issues

MISO Future	Load Growth Outside ATC	Central U.P. Future	Scalable Load Growth	Point Load Changes	Generation Additions	Generation Retirements	Existing Generation	Wind Gen. Additions	Rogers City Generation	Central U.P. System Summary
Reference	Upper	Robust Economy	Upper	Upper	+60/110 MW	-116 MW	Upper	+50 MW	Upper	Large load increase, net generation reductions, Sawyer bio-mass
Environmental	Mid	High Retirements	Mid	Mid	None	-138 MW	Lower	+50 MW	Upper	Maximum Escanaba area import
Environmental	Mid-Lower	High Environmental	Mid-Lower	Mid-Lower	None	-116 MW	Mid-Lower	+100 MW	Lower	High Escanaba area import
Reference	Lower	Slow Growth	Lower	Lower	+10 MW	-116 MW	Mid	+200 MW	Lower	Modest generation/load balance issues
20% Wind	Mid-Upper	DOE 20% Wind	Mid-Upper	Mid-Upper	None	-138 MW	Lower	+200 MW	Mid	Maximum Escanaba area import
Investment Limitation	Mid-Lower	Fuel & Inv. Limitations	Mid	Mid-Lower	+10 MW	-116 MW	Mid	None	Lower	Modest generation/load balance issues

MISO Future	Load Growth Outside ATC	Eastern U.P. Future	Scalable Load Growth	Point Load Changes	Generation Additions	Generation Retirements	Existing Generation	Wind Gen. Additions	Rogers City Generation	Eastern U.P. System Summary
Reference	Upper	Robust Economy	Upper	Upper	+101 MW	None	Mid	+50 MW	Upper	Large load & generation increase, LP Gen. = high E-W flows
Environmental	Mid	High Retirements	Mid	Mid	+29 MW	None	Mid-Upper	+50 MW	Upper	LP Gen. = high E-W flows
Environmental	Mid-Lower	High Environmental	Mid-Lower	Mid-Lower	+5 MW	None	Mid	+100 MW	Lower	Modest generation/load balance issues
Reference	Lower	Slow Growth	Lower	Lower	+5 MW	None	Upper	+200 MW	Lower	Modest generation/load balance issues
20% Wind	Mid-Upper	DOE 20% Wind	Mid-Upper	Mid-Upper	+93 MW	None	Mid	+200 MW	Mid	Modest generation/load balance issues
Investment Limitation	Mid-Lower	Fuel & Inv. Limitations	Mid	Mid-Lower	+5 MW	None	Lower	None	Lower	Hydro off-line = high import + load-serving issues