

Capacity Factors From the Baseline Studies and the North, East, and West Alternatives 7-26-04

Note: Includes the upgrade of the North Madison to Blount 69 kV line to 138 kV and the addition of four 345 kV line segments in Illinois to provide outlets for some of the new generation included in PROMOD.

Note: The capacity factors are a function of: (1) the input data from NewEnergy Associates' PowerBase database (including unit capacities, heat rates, fuel costs, etc.), (2) the PROMOD security constrained optimal dispatch (SCOD) and (3) the increased import capability predicted for 2012. As a result, unit dispatch may be somewhat different from historical patterns. For example, it appears that the capacity factors on the combustion turbines are somewhat lower than historical levels. This result is not unexpected given the higher import capability and the SCOD. NewEnergy Associates' (NEA) PROMOD License Agreement only allows unit input data to be reviewed by the owner/operator of the plant. NEA does not break out UPPCO as a separate control area in PROMOD so their units are listed under WEP.

Company	UnitTyp	UnitDescription	Base Case Capacity Factor: (%)	Base Case Plus Fixes Capacity Factor (%)	Byron - NMA Capacity Factor (%)	Salem - NMA Capacity Factors (%)	North to Canada Capacity Factors (%)	East Across Lake Capacity Factors (%)	West: Adams-Columbia Capacity Factors (%)
MGE	FOSSIL	Blount:1	11.7	11.4	12.1	11.8	11.9	11.5	12.0
MGE	FOSSIL	Blount:3	23.4	20.3	21.7	18.4	22.8	26.1	20.7
MGE	FOSSIL	Blount:4	29.1	27.1	25.4	24.8	28.7	31.9	28.0
MGE	FOSSIL	Blount:5	27.0	24.7	21.6	21.6	26.5	29.9	24.8
MGE	FOSSIL	Blount:6	36.8	35.9	32.5	32.5	38.0	41.7	34.2
MGE	FOSSIL	Blount:7	37.1	34.8	30.1	32.9	36.7	40.8	33.5
MGE	FOSSIL	Columbia (WPL):1	81.9	81.0	80.8	80.9	81.6	83.0	81.2
MGE	FOSSIL	Columbia (WPL):2	81.1	80.6	80.3	80.5	80.7	82.0	80.4
MGE	TURBINE	Fitchburg (MGE):1	2.9	2.3	1.6	1.8	2.7	2.6	2.9
MGE	TURBINE	Fitchburg (MGE):2	2.9	2.4	1.7	2.0	2.9	2.7	3.0
MGE	TURBINE	Nine Springs:GT1	3.2	2.6	2.0	2.2	3.1	3.0	3.2
MGE	TURBINE	Sycamore (MGE):1	0.3	0.2	0.1	0.1	0.4	0.4	0.4
MGE	TURBINE	Sycamore (MGE):2	0.7	0.6	0.3	0.4	0.7	0.7	0.8
MGE	TURBINE	University Of Wisconsin Plant:GT	2.6	1.5	1.0	1.0	2.2	1.6	2.7
MGE	TURBINE	West Marinette (Mge):34	0.5	0.4	0.6	0.5	0.5	0.4	0.5
MGE	WIND	Rosiere (MGE):WIOP1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
WEP	FOSSIL	Edgewater (WPL):5	74.4	74.6	73.4	74.2	75.3	78.8	73.6
WEP	FOSSIL	Escanaba:STCL2	30.9	29.5	27.8	31.2	28.3	31.8	29.5
WEP	FOSSIL	Oak Creek North:ST1	66.6	66.8	65.0	65.6	65.5	69.5	64.5
WEP	FOSSIL	Oak Creek North:ST2	68.1	68.0	67.5	67.2	68.3	72.2	67.4
WEP	FOSSIL	Oak Creek South:5	86.6	86.5	86.6	86.7	86.8	86.8	86.4
WEP	FOSSIL	Oak Creek South:6	86.6	86.4	86.6	86.5	86.6	86.7	86.5
WEP	FOSSIL	Oak Creek South:7	86.3	85.9	86.2	86.2	86.3	86.8	85.9
WEP	FOSSIL	Oak Creek South:8	82.4	81.9	81.9	82.2	81.9	82.8	81.8
WEP	FOSSIL	Pleasant Prairie:1	84.7	84.1	84.3	84.2	84.4	85.1	84.2
WEP	FOSSIL	Pleasant Prairie:2	83.7	82.7	83.3	83.4	82.9	84.6	82.9
WEP	FOSSIL	Port Washington (Wep):CC	12.3	10.9	10.6	9.9	11.8	12.5	10.9
WEP	FOSSIL	Port Washington (Wep):CC2	9.7	8.9	9.0	8.5	9.9	10.8	9.0
WEP	FOSSIL	Presque Isle:1	12.7	12.4	13.8	14.1	12.6	14.4	13.3
WEP	FOSSIL	Presque Isle:2	15.7	16.5	16.7	16.7	17.1	18.0	16.8
WEP	FOSSIL	Presque Isle:3	62.2	63.1	61.1	61.6	63.7	65.1	61.2
WEP	FOSSIL	Presque Isle:4	65.2	63.7	63.5	66.0	66.5	68.3	63.0
WEP	FOSSIL	Presque Isle:5	62.1	60.4	61.0	61.2	63.4	65.7	60.7
WEP	FOSSIL	Presque Isle:6	59.9	59.5	59.3	60.4	61.6	63.3	59.3
WEP	FOSSIL	Presque Isle:7	58.8	56.6	56.3	57.3	58.2	61.4	57.1
WEP	FOSSIL	Presque Isle:8	58.4	57.1	54.0	55.2	60.3	62.9	55.9
WEP	FOSSIL	Presque Isle:9	50.4	51.9	48.2	48.9	52.4	54.5	51.6
WEP	FOSSIL	Shiras:1	35.8	32.4	34.2	34.3	35.4	37.8	32.4
WEP	FOSSIL	Shiras:3	52.7	49.3	49.1	49.9	52.0	54.0	49.1
WEP	FOSSIL	Valley (WEP):1	44.5	42.9	42.4	42.5	44.9	49.3	42.2
WEP	FOSSIL	Valley (WEP):2	45.5	45.3	43.4	44.1	46.7	50.3	43.8
WEP	FOSSIL	Whitewater Cogeneration Facility:CC	16.3	16.5	14.3	16.1	17.8	18.5	15.2
WEP	HYDRO	Autrain:HYOP2	56.5	56.5	56.5	56.5	56.5	56.5	56.5
WEP	HYDRO	Big Quinnesec 61:HYOP2	42.5	42.5	42.5	42.5	42.5	42.5	42.5
WEP	HYDRO	Big Quinnesec 92:HYOP2	80.8	80.8	80.8	80.8	80.8	80.8	80.8
WEP	HYDRO	Brule:HYOP3	44.1	44.1	44.1	44.1	44.1	44.1	44.1
WEP	HYDRO	Cataract (UPP):HYOP1	29.8	29.8	29.8	29.8	29.8	29.8	29.8
WEP	HYDRO	Chalk Hill:HYOP3	67.6	67.6	67.6	67.6	67.6	67.6	67.6
WEP	HYDRO	Edison Sault:HYOP73	87.1	87.1	87.1	87.1	87.1	87.1	87.1
WEP	HYDRO	Hemlock Falls:HYOP1	79.0	79.0	79.0	79.0	79.0	79.0	79.0
WEP	HYDRO	Hoist:HYOP3	35.5	35.5	35.5	35.5	35.5	35.5	35.5
WEP	HYDRO	Kingsford:HYOP3	57.7	57.7	57.7	57.7	57.7	57.7	57.7
WEP	HYDRO	McClure (UPP):HYOP2	54.8	54.8	54.8	54.8	54.8	54.8	54.8
WEP	HYDRO	Michigamme Falls:HYOP2	51.9	51.9	51.9	51.9	51.9	51.9	51.9
WEP	HYDRO	Peavy Falls:HYOP2	49.4	49.4	49.4	49.4	49.4	49.4	49.4
WEP	HYDRO	Pine:HYOP2	63.1	63.1	63.1	63.1	63.1	63.1	63.1
WEP	HYDRO	Plant Two:HYOP2	49.9	49.9	49.9	49.9	49.9	49.9	49.9
WEP	HYDRO	Prickett:HYOP2	47.8	47.8	47.8	47.8	47.8	47.8	47.8
WEP	HYDRO	Saint Marys Falls:HYOP5	86.3	86.3	86.3	86.3	86.3	86.3	86.3
WEP	HYDRO	Twin Falls (WEP):HYOP5	65.5	65.5	65.5	65.5	65.5	65.5	65.5
WEP	HYDRO	Victoria (UPP):HYOP2	65.4	65.4	65.4	65.4	65.4	65.4	65.4
WEP	HYDRO	Way:HYOP1	48.9	48.9	48.9	48.9	48.9	48.9	48.9
WEP	HYDRO	WEP Small Hydros:HYOP4	51.7	51.7	51.7	51.7	51.7	51.7	51.7
WEP	HYDRO	White Rapids:HYOP3	56.1	56.1	56.1	56.1	56.1	56.1	56.1
WEP	NUCLEAR	Point Beach:1	94.0	94.0	94.0	94.0	94.0	94.0	94.0
WEP	NUCLEAR	Point Beach:2	84.7	84.7	84.7	84.7	84.7	84.7	84.7
WEP	TURBINE	Concord:1	1.3	1.2	1.1	0.9	1.2	1.1	1.2
WEP	TURBINE	Concord:2	0.9	0.9	0.8	0.7	1.1	0.7	0.9
WEP	TURBINE	Concord:3	1.3	1.2	1.0	0.9	1.2	1.1	1.2
WEP	TURBINE	Concord:4	1.3	1.4	1.2	1.2	1.5	1.3	1.3
WEP	TURBINE	Dafer:GTOL5	4.1	4.4	4.7	4.2	3.3	3.8	3.9
WEP	TURBINE	Detour:GTOL2	5.2	5.4	5.8	5.1	4.3	4.5	4.8
WEP	TURBINE	Germantown:1	0.3	1.3	1.3	1.0	1.3	1.4	1.2
WEP	TURBINE	Germantown:2	1.4	0.4	0.4	0.3	0.5	0.6	0.2
WEP	TURBINE	Germantown:3	0.4	0.1	0.1	0.1	0.2	0.1	0.1
WEP	TURBINE	Germantown:4	0.0	0.1	0.0	0.0	0.1	0.1	0.5
WEP	TURBINE	Germantown:5	0.5	0.5	0.5	0.5	0.6	0.5	0.6
WEP	TURBINE	Gladstone - UPP:1	0.1	0.3	0.3	0.2	0.0	0.1	0.2
WEP	TURBINE	Manistique:GTOL2	2.1	2.0	2.3	2.2	1.1	1.9	2.1
WEP	TURBINE	Neenah:GT1	0.8	1.0	0.9	0.7	1.0	0.6	0.9
WEP	TURBINE	Neenah:GT2	1.3	1.2	1.3	1.2	1.2	0.9	1.5
WEP	TURBINE	Oak Creek South:9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEP	TURBINE	Paris (WEP):1	0.4	0.5	0.2	0.4	0.7	0.6	0.5
WEP	TURBINE	Paris (WEP):2	0.3	0.3	0.2	0.2	0.5	0.4	0.4
WEP	TURBINE	Paris (WEP):3	0.1	0.1	0.1	0.2	0.2	0.2	0.3
WEP	TURBINE	Paris (WEP):4	0.5	0.5	0.3	0.4	0.5	0.4	0.5
WEP	TURBINE	Plant Four:GT1	0.1	0.2	0.3	0.1	0.0	0.0	0.2
WEP	TURBINE	Point Beach:5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WEP	TURBINE	Portage - UPP:1	0.2	0.4	0.5	0.4	0.0	0.2	0.2
WEP	TURBINE	Valley (WEP):3	0.4	0.4	0.2	0.1	0.4	0.4	0.5
WEP	WIND	Byron (WEP):WIOP2	33.1	33.1	33.1	33.1	33.1	33.1	33.1
WEP	WIND	Montfort Wind Farm:WIOP1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
WPL	FOSSIL	Blackhawk:3	7.3	6.4	8.1	7.3	7.3	7.3	7.6
WPL	FOSSIL	Blackhawk:4	6.8	6.1	7.5	6.9	6.8	7.0	7.1
WPL	FOSSIL	Columbia (WPL):1	81.9	81.0	80.8	80.9	81.6	83.0	81.2
WPL	FOSSIL	Columbia (WPL):2	81.1	80.6	80.3	80.5	80.7	82.0	80.4
WPL	FOSSIL	Dewey:1	62.0	59.0	59.1	60.2	61.8	65.2	63.1
WPL	FOSSIL	Dewey:2	63.2	60.5	60.1	61.2	62.4	66.1	63.0
WPL	FOSSIL	Edgewater (WPL):3	61.0	60.6	59.3	59.6	61.3	65.0	59.9
WPL	FOSSIL	Edgewater (WPL):4	83.1	83.0	82.9	82.8	83.1	83.5	82.9
WPL	FOSSIL	Edgewater (WPL):5	74.4	74.6	73.4	74.2	75.3	78.8	73.6
WPL	FOSSIL	Riverside Energy Center:CC	16.6	16.0	10.2	12.1	15.4	17.6	14.5
WPL	FOSSIL	Rock River:1	5.8	4.6	5.7	5.1	5.9	5.8	6.0
WPL	FOSSIL	Rock River:2	4.5	3.7	4.5	4.0	4.4	4.2	4.8
WPL	HYDRO	Castle Rock:HYOP5	65.8	65.8	65.8	65.8	65.8	65.8	65.8
WPL	HYDRO	Kilbourn:HYOP4	74.4	74.4	74.4	74.4	74.4	74.4	74.4
WPL	HYDRO	Prairie Du Sac:HYOP8	56.0	56.0	56.0	56.0	56.0	56.0	56.0
WPL	HYDRO	WPL Small Hydros:HYOP10	55.0	55.0	55.0	55.0	55.0	55.0	55.0
WPL	NUCLEAR	Kewaunee:1	85.2	85.2	85.2	85.2	85.2	85.2	85.2
WPL	TURBINE	Rock River:3	0.2	0.2	0.2	0.1	0.2	0.3	0.2
WPL	TURBINE	Rock River:4	0.0	0.1	0.0	0.0	0.0	0.1	0.1
WPL	TURBINE	Rock River:5	0.3	0.2	0.1	0.1	0.3	0.4	0.5
WPL	TURBINE	Rock River:6	0.4	0.3	0.3	0.7	0.9	1.0	0.5
WPL	TURBINE	Rockgen Energy Center:1	1.3	0.8	0.7	0.8	1.4	1.2	1.2
WPL	TURBINE	Rockgen Energy Center:2	1.3	0.9	0.7	0.8	1.3	1.1	1.7
WPL	TURBINE	Rockgen Energy Center:3	1.4	1.0	0.7	0.8	1.4	1.2	1.8
WPL	TURBINE	Sheepskin:1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WPL	TURBINE	South Fond Du Lac:GT1	0.2	0.1	0.1	0.1	0.2	0.2	0.3
WPL	TURBINE	South Fond Du Lac:GT2	0.3	0.3	0.2	0.3	0.4	0.5	0.6
WPL	TURBINE	South Fond Du Lac:GT3	0.6	0.5	0.5	0.5	0.6	0.6	0.8
WPL	TURBINE	South Fond Du Lac:GT4	0.2	0.0	0.1	0.1	0.2	0.3	0.4
WPPI	FOSSIL	Kaukauna (MIDAMH):CC	16.2	13.5	13.5	13.1	14.5	17.3	14.2
WPPI	FOSSIL	Menasha:STCL2	22.1	18.9	18.1	17.7	20.0	24.4	18.7
WPPI	HYDRO	Combined Locks:HYOP2	79.0	79.0	79.0	79.0	79.0	79.0	79.0
WPPI	HYDRO	Kaukauna Hy:HYOP2	83.2	83.2	83.2	83.2	83.2	83.2	83.2
WPPI	HYDRO	Little Chute:HYOP3	71.7	71.7	71.7	71.7	71.7	71.7	71.7
WPPI	HYDRO	New Badger:HYOP2	69.7	69.7	69.7	69.7	69.7	69.7	69.7
WPPI	HYDRO	Old Badger:HYOP2	67.7	67.7	67.7	67.7	67.7	67.7	67.7
WPPI	HYDRO	Rapide Croche:HYOP4	65.5	65.5	65.5	65.5	65.5	65.5	65.5
WPPI	TURBINE	Black River Falls:GTOL4	2.1	1.9	2.0	1.7	1.4	1.2	

Company	UnitTyp	UnitDescription	Base Case Capacity Factor: (%)	Base Case Plus Fixes Capacity Factor (%)	Byron - NMA Capacity Factor (%)	Salem - NMA Capacity Factors (%)	North to Canada Capacity Factors (%)	East Across Lake Capacity Factors (%)	West: Adams-Columbia Capacity Factors (%)
WPPI	TURBINE	Menasha:IC1	1.4	0.9	0.9	0.9	1.5	0.4	2.1
WPPI	TURBINE	River Falls (Junction):GTGS6	0.7	0.8	0.9	0.8	0.4	0.4	0.8
WPS	FOSSIL	Columbia (WPL):1	81.9	81.0	80.8	80.9	81.6	83.0	81.2
WPS	FOSSIL	Columbia (WPL):2	81.1	80.6	80.3	80.5	80.7	82.0	80.4
WPS	FOSSIL	Edgewater (WPL):4	83.1	83.0	82.9	82.8	83.1	83.5	82.9
WPS	FOSSIL	Manitowoc:5	33.8	30.0	28.4	30.3	33.3	37.0	31.4
WPS	FOSSIL	Manitowoc:6	32.7	31.9	31.7	33.2	33.6	37.0	31.9
WPS	FOSSIL	Manitowoc:New Coal Unit	46.0	44.6	44.5	44.7	45.8	49.4	44.5
WPS	FOSSIL	Manitowoc:STCL3	29.0	29.8	27.5	27.5	28.9	33.8	27.8
WPS	FOSSIL	Pulliam:3	52.3	50.2	50.0	51.4	51.9	56.7	49.3
WPS	FOSSIL	Pulliam:4	51.3	48.8	48.0	48.4	50.3	55.2	48.4
WPS	FOSSIL	Pulliam:5	54.3	51.9	51.5	52.1	54.8	59.5	52.7
WPS	FOSSIL	Pulliam:6	55.7	54.1	54.4	54.7	55.0	60.0	54.3
WPS	FOSSIL	Pulliam:7	70.2	70.2	69.6	69.9	69.9	72.1	70.0
WPS	FOSSIL	Pulliam:8	70.0	69.9	69.3	69.0	70.7	75.0	69.7
WPS	FOSSIL	Weston (WPS):1	70.5	69.7	69.7	69.3	70.6	72.6	70.1
WPS	FOSSIL	Weston (WPS):2	85.3	84.2	84.6	84.3	84.6	85.5	84.9
WPS	FOSSIL	Weston (WPS):3	79.9	79.0	79.5	78.7	79.7	81.8	79.4
WPS	FOSSIL	Weston (WPS):4	73.4	72.7	72.0	72.1	73.6	76.9	72.9
WPS	FOSSIL	Wisconsin Rapids Pulp Mill:BIRON PM	34.5*	34.5*	34.5*	34.5*	34.5*	34.5*	34.5*
WPS	FOSSIL	Wisconsin Rapids Paper Mill:HOT POND	48.2*	48.2*	48.2*	48.2*	48.2*	48.2*	48.2*
WPS	FOSSIL	Wisconsin Rapids Pulp Mill:KRAFT	23.5*	23.5*	23.5*	23.5*	23.5*	23.5*	23.5*
WPS	HYDRO	Alexander (WPS):HYOP3	86.8	86.8	86.8	86.8	86.8	86.8	86.8
WPS	HYDRO	Biron:HYOP4	45.0	45.0	45.0	45.0	45.0	45.0	45.0
WPS	HYDRO	Caldron Falls:HYOP2	29.4	29.4	29.4	29.4	29.4	29.4	29.4
WPS	HYDRO	Du Bay:HYOP4	71.6	71.6	71.6	71.6	71.6	71.6	71.6
WPS	HYDRO	Grand Rapids (WPS):HYOP5	82.7	82.7	82.7	82.7	82.7	82.7	82.7
WPS	HYDRO	Grandfather Falls:HYOP2	65.8	65.8	65.8	65.8	65.8	65.8	65.8
WPS	HYDRO	High Falls (WPS):HYOP5	28.8	28.8	28.8	28.8	28.8	28.8	28.8
WPS	HYDRO	Johnson Falls:HYOP2	32.4	32.4	32.4	32.4	32.4	32.4	32.4
WPS	HYDRO	Merrill:HYOP3	61.9	61.9	61.9	61.9	61.9	61.9	61.9
WPS	HYDRO	Petenwell:HYOP4	61.4	61.4	61.4	61.4	61.4	61.4	61.4
WPS	HYDRO	Sandstone Rapids:HYOP2	36.5	36.5	36.5	36.5	36.5	36.5	36.5
WPS	HYDRO	Stevens Point:HYOP6	64.4	64.4	64.4	64.4	64.4	64.4	64.4
WPS	HYDRO	Tomahawk:HYOP2	64.6	64.6	64.6	64.6	64.6	64.6	64.6
WPS	HYDRO	Wausau:HYOP3	81.4	81.4	81.4	81.4	81.4	81.4	81.4
WPS	HYDRO	Wisconsin Rapids Division:HYOP3	39.6	39.6	39.6	39.6	39.6	39.6	39.6
WPS	HYDRO	Wisconsin River Div:HYOP2	17.1	17.1	17.1	17.1	17.1	17.1	17.1
WPS	NUCLEAR	Kewaunee:1	85.2	85.2	85.2	85.2	85.2	85.2	85.2
WPS	TURBINE	BIG POND:New CT	4.1	3.2	0.6	3.1	4.2	4.1	2.6
WPS	TURBINE	Combined Locks Energy Center:WPS Power Development Inc	4.7	3.9	3.9	3.7	4.2	4.6	4.4
WPS	TURBINE	Custer Energy Center:1	0.8	0.7	0.7	0.6	0.7	0.6	0.7
WPS	TURBINE	De Pere Energy Center:GT	1.2	1.7	1.6	1.5	1.7	1.7	2.2
WPS	TURBINE	Eagle River:GTOL2	3.6	2.9	1.9	2.8	3.6	3.8	3.2
WPS	TURBINE	ESC STM:New CT	0.7	0.9	3.1	0.8	0.0	0.5	0.7
WPS	TURBINE	Kewaunee:IC	0.6	0.2	0.6	1.0	0.5	0.2	1.1
WPS	TURBINE	Manitowoc:GTGS2	5.6	5.5	5.1	4.9	5.5	5.5	5.4
WPS	TURBINE	Pulliam:GT	1.5	1.3	1.3	1.1	1.3	1.6	1.5
WPS	TURBINE	West Marinette:31	4.2	4.0	4.0	4.1	4.3	4.5	4.2
WPS	TURBINE	West Marinette:32	5.5	5.2	5.1	5.2	5.3	5.7	5.7
WPS	TURBINE	West Marinette:33	2.8	2.3	2.7	2.5	2.5	2.5	2.6
WPS	TURBINE	Weston (WPS):31	0.1	0.2	0.4	0.2	0.0	0.2	0.7
WPS	TURBINE	Weston (WPS):32	3.4	3.4	3.3	2.9	3.6	4.1	3.4

* The output of the CWP/Stora Enso plants, BIRON, HOT POND and KRAFT were incorrectly modeled as energy limited, which has been fixed in subsequent runs.