

PV Capacity Testing:

Sensitivity of technical choices

PVPMC MAY 2025

Comparing technical choices of analysis at a single project

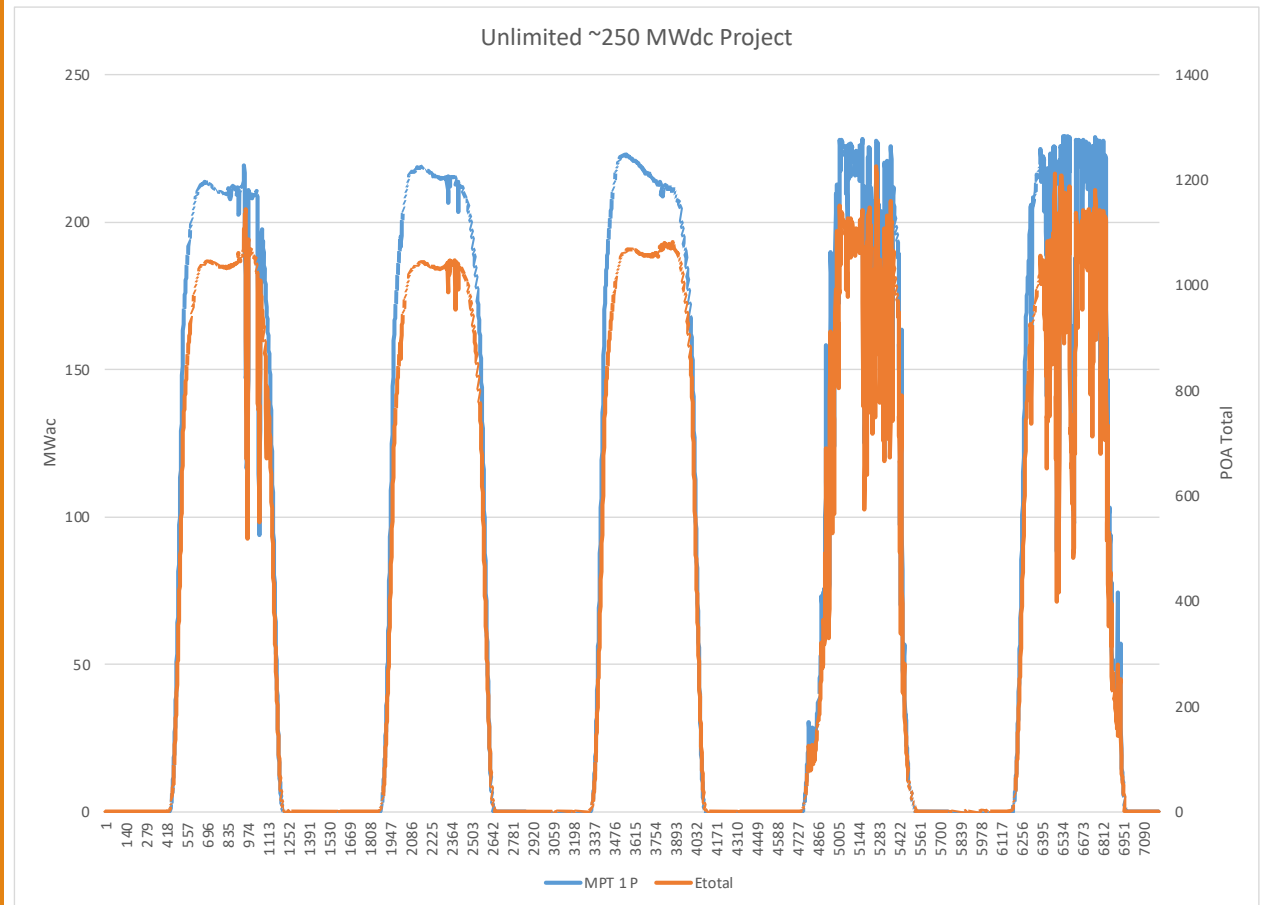
1.06 DCAC at inverters

1.24 DCAC at POI (200 MW)

Minimal shading

3 reasonably clear days out of 5

1 afternoon excluded due to inverter and tracker outages



SUNSHINE ANALYTICS LLC

Reviewing sensitivity of technical choices

ASTM or power adjusted by temperature?

Possible regression equations:

ASTM e2848-13

$$P = E(a_1 + a_2E + a_3T_a + a_4v)$$

P = Power
E = POA (Total)
T_a = Ambient Temp
v = Wind Speed

ASTM e2848-13 (alternative)

$$\frac{P}{1 + \beta(T_{cell} - T_{RC})} = a_1 * E_{total} + a_2$$

P = Power
E_{total} = POA (Total)
T_{cell} = Module Cell Temp
β = power temperature coefficient

ASTM e2848-13 (2nd alternative)

$$\frac{P}{1 + \beta(T_{cell} - T_{RC})} = a_1 * E_{front} + a_2 * E_{rear} + const$$

P = Power
E_{front} = Front POA
E_{rear} = Rear POA
T_{cell} = Module Cell Temp
β = power temperature coefficient

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RCs from model or measured data?

DCAC ratio impact?

Daily variation?

PVsyst matching measured albedo

Grid Limit?	Regression	RCs	Irr	PVsyst	Valid Points	Meas Pt Spread	Capacity Ratio	Std Error	Range of Daily Cap Ratio
Unlimited	ASTM	Model	Ettotal	alb 20	1,150	21%/79%	102.5%	2.4%	4.9%
	Tadj		POA, RPOA				99.7%		3.8%
	ASTM		Ettotal				101.5%		7.2%
	Tadj		POA, RPOA				102.6%		4.9%
	ASTM	Meas	Ettotal	meas alb (22)		44%/56%	99.8%		3.7%
	Tadj		POA, RPOA				102.9%		6.5%
	ASTM		Ettotal				100.4%		10.4%
	Tadj		POA, RPOA				98.9%		2.7%
							102.1%		5.1%
Limited to 200 MW	ASTM	Model	Ettotal	alb 20	300	32%/68%	101.4%	3.3%	7.5%
	Tadj		POA, RPOA				100.5%		4.7%
	ASTM		Ettotal				102.7%		13.9%
	Tadj		POA, RPOA				101.3%		8.2%
	ASTM	Meas	Ettotal	meas alb (22)		45%/55%	100.6%		4.8%
	Tadj		POA, RPOA				103.4%		17.6%
	ASTM		Ettotal				100.6%		16.7%
	Tadj		POA, RPOA				100.3%		4.5%
							100.2%		8.6%

Reviewing sensitivity of technical choices

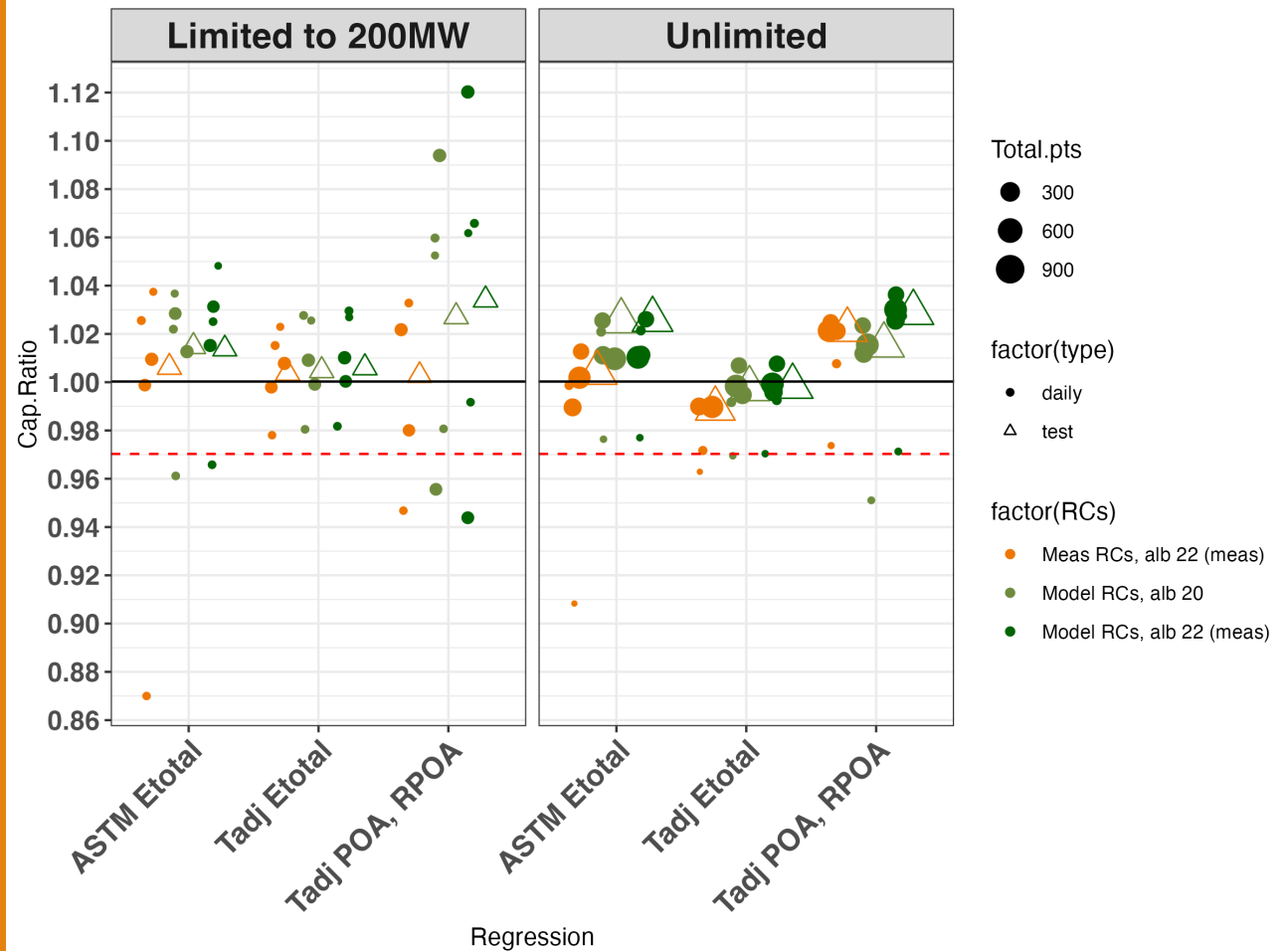
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RCs from model or measured data

DCAC ratio impact

Daily variation

PVsyst matching measured albedo



Conclusions

1. The ASTM alternative (temperature-adjusted Power vs Total POA) is more stable on a daily basis, though it may report a lower Capacity Ratio than the standard ASTM.
2. It is more important to focus on quality data than quantity
3. Pray for stable skies