

Solar Decathlon 2005 - PV System Strategies and Results

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The Ground Rules

- Collegiate Teams
- Solar energy *only!*
- 10 Contests: decathlon
- Home, car, home office
- Lot size: 5500 sq.ft.
- 800 sq.ft. footprint
- 450 sq.ft. home min.
- 18 ft. height limit
- Cannot shade neighbors
- Must comply with codes
- NPS regulations
- Public tours required
- ADA route for tours
- Transport to/from DC
- 21 day schedule

Solar Decathlon 2005 Schedule

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	Sept 26	Sept 27	Sept 28 Registration Staff Mtg. All Team Mtg.	Sept 29	Sept 30	Oct 1
				Team & Village Assembly		
Oct 2	Oct 3	Oct 4	Oct 5	Oct 6	Oct 7	Oct 8
Team & Village Assembly		Instrument Houses & Web Connect		Opening Ceremony (AM)	Day One	Day Two
					Building Industry Day	Judging Begins
Oct 9	Oct 10	Oct 11	Oct 12	Oct 13	Oct 14	Oct 15
Day Three	Day Four	Day Five	Day Six (no tours)	Day Seven	Day Eight	Tours All Day
	Objective evaluations begin	School Day			Finish 2:00 PM	
Oct 16	Oct 17	Oct 18	Oct 19	Tour Hours: 9 a.m – 6p.m. Weekends 11 a.m. – 4 p.m. Weekdays Workshops: 10:30 a.m., 12:30, 2:30 & 4:30 p.m. Weekends 11:30 a.m., 1:30 p.m., Weekdays		
Tours & Workshops		Disassembly				

Tours /Workshops

Tours /Workshops

Tours /Workshops

Tours /Workshops

Tours /Workshops

Tours /Workshops

2005 Solar Decathlon Collegiate Teams

California Polytechnic Institute – San Luis Obispo

Carnegie Mellon University

Concordia University - Montréal (Canada)

Cornell University

Crowder College

Florida International University

New York Institute of Technology

Rhode Island School of Design

Universidad Politécnica de Madrid (Spain)

University of Colorado – Boulder

University of Maryland

University of Massachusetts – Dartmouth

University of Michigan

University of Missouri – Rolla and Rolla Technical Institute

University of Puerto Rico – Mayagüez

University of Texas at Austin

Virginia Polytechnic Institute and State University

Washington State University







2012 NATIONAL
DEFENDING
CHAMPIONS

6

United
Rentals

6036





101
California
Polytechnic
State University
101

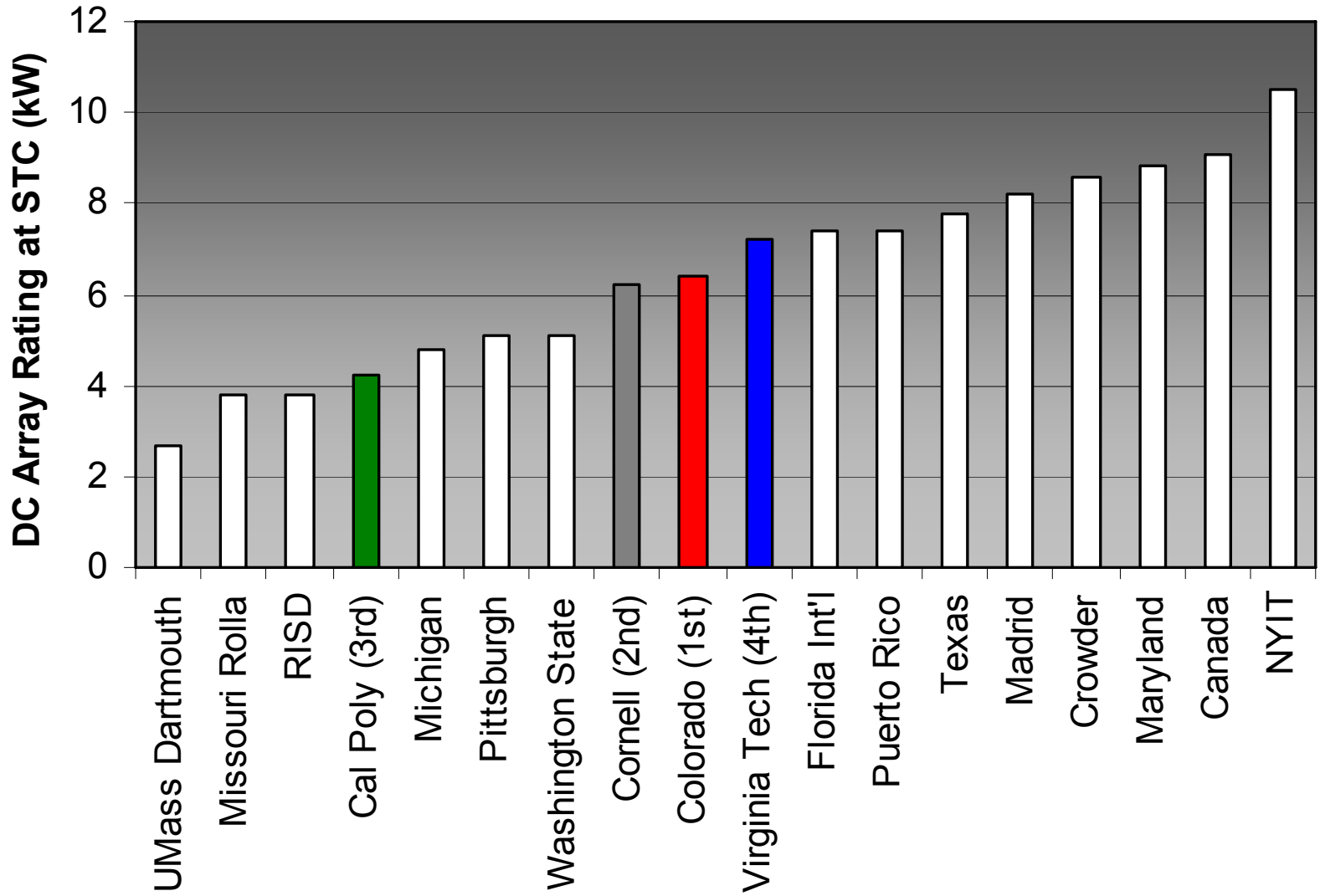


The 10 Decathlon Contests

1. **Architecture** 200 pts
2. **Dwelling** 100 pts
3. **Documentation** 100 pts
4. **Communications** 100 pts
5. **Comfort Zone** 100 pts
6. **Appliances** 100 pts
7. **Hot Water** 100 pts
8. **Lighting** 100 pts
9. **Energy Balance** 100 pts
10. **Getting Around** 100 pts



PV Array Sizes



Virginia Tech
SunPower 7.2 kW



Virginia Tech
SunPower 7.2 kW







CalPoly SLO
BP 4.9 kW



CalPoly SLO
BP 4.9 kW







NYIT
Sanyo 10.8 kW





Cornell
GE 6.2 kW



Cornell
GE 6.2 kW



FIU
BP 7.2 kW



FIU
BP 7.2 kW





FIU
MSK 0.17 kW

FIU
MSK 0.17 kW



Texas
BP 7.9 kW



Texas

BP Romag 0.5 kW

BP 7.9 kW




OPCATHEDON
University of
Texas at Austin
104

UMR-RTI
Unisolar 3.8 kW



UMR-RTI
Unisolar 3.8 kW



The image shows an outdoor setup of photovoltaic equipment. In the foreground, there are two large, rectangular solar panels with a grid of cells. Behind them, a stack of inverters is visible, with a black panel on top. The equipment is situated on a dirt and grass area. To the right, there is a white metal frame structure. The background includes wooden structures and more solar panels.

Crowder
Sanyo 8.6 kW



Crowder

Crowder
Sanyo 8.6 kW



Colorado
SunPower 6.8 kW
SBM 0.18 kW



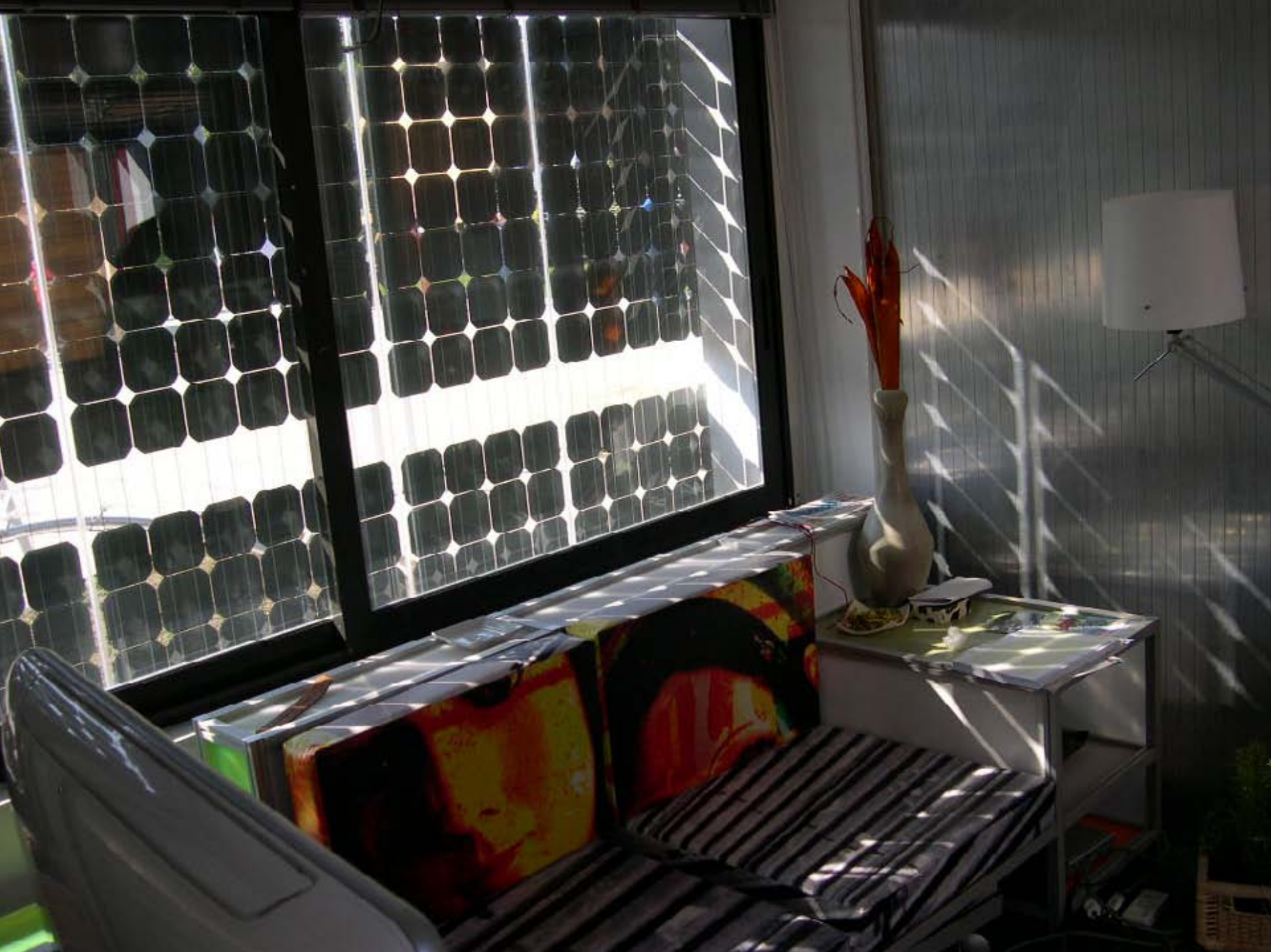


Madrid
Isofoton 8.1 kW

Madrid

Isofoton 8.1 kW





Michigan
Sanyo 6.1 kW





Michigan
Sanyo 6.1 kW

Michigan
Sanyo 6.1 kW



Scoring After Contests 1-4

Architecture, Dwelling, Documentation, and Communications

1. Virginia Tech	469
2. Cal Poly	445
3. NYIT	439
4. Colorado	437
5. Texas	434
6. Pittsburg	430
7. Cornell	419
8. RISD	394



111

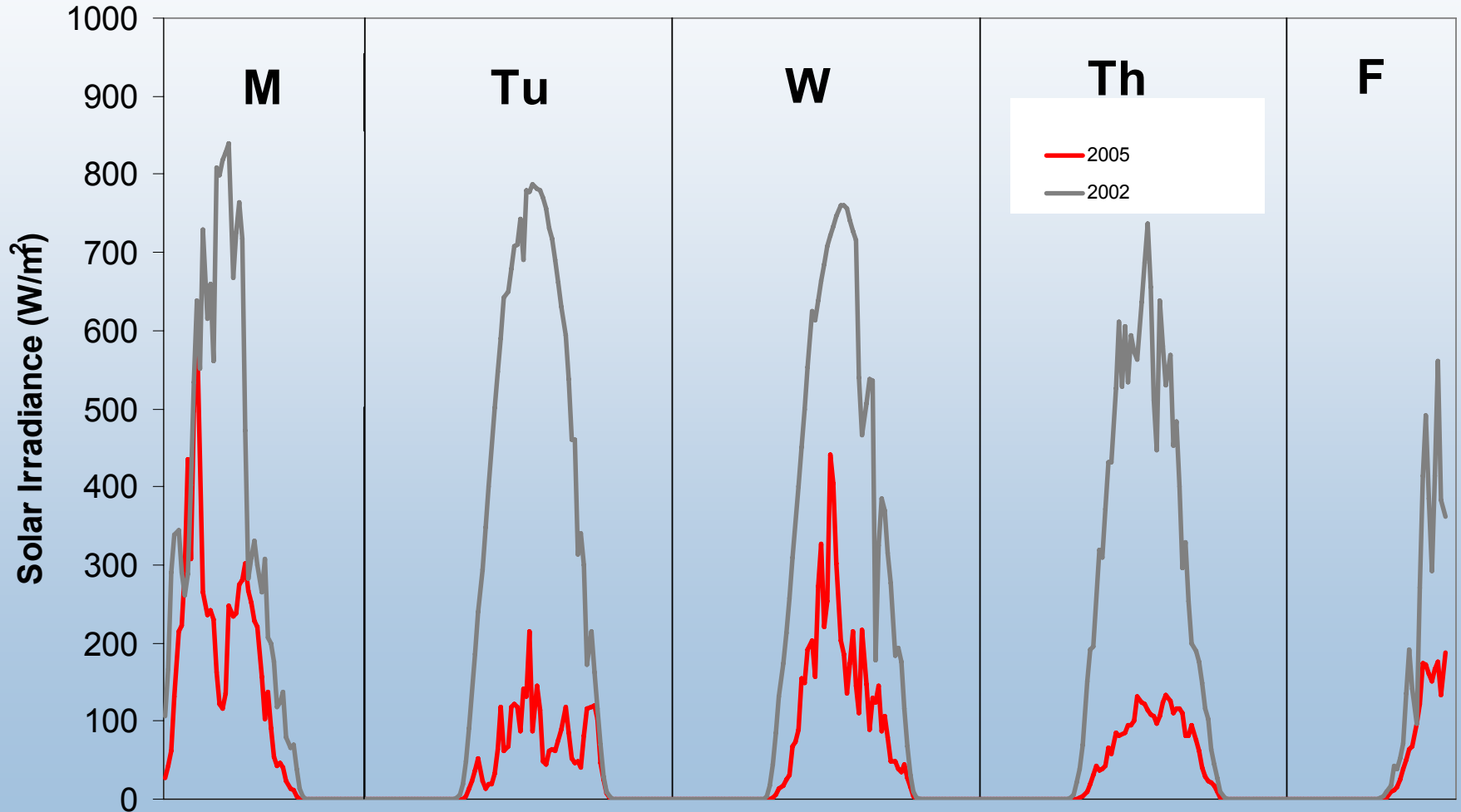
Informational sign with text and images.

Informational sign with text and images.

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Global Horizontal Solar Irradiance at the Solar Decathlon





Texas
Exide AGM 57 kWh

Cornell

C&D AGM 95 kWh



Puerto Rico
MK Gel 119 kWh





Virginia Tech
Concorde AGM 62 kWh
Sunny Boy/Sunny Island



CalPoly
Trojan AGM 66.2 kWh
Xantrex



UMR/RTI
Outback

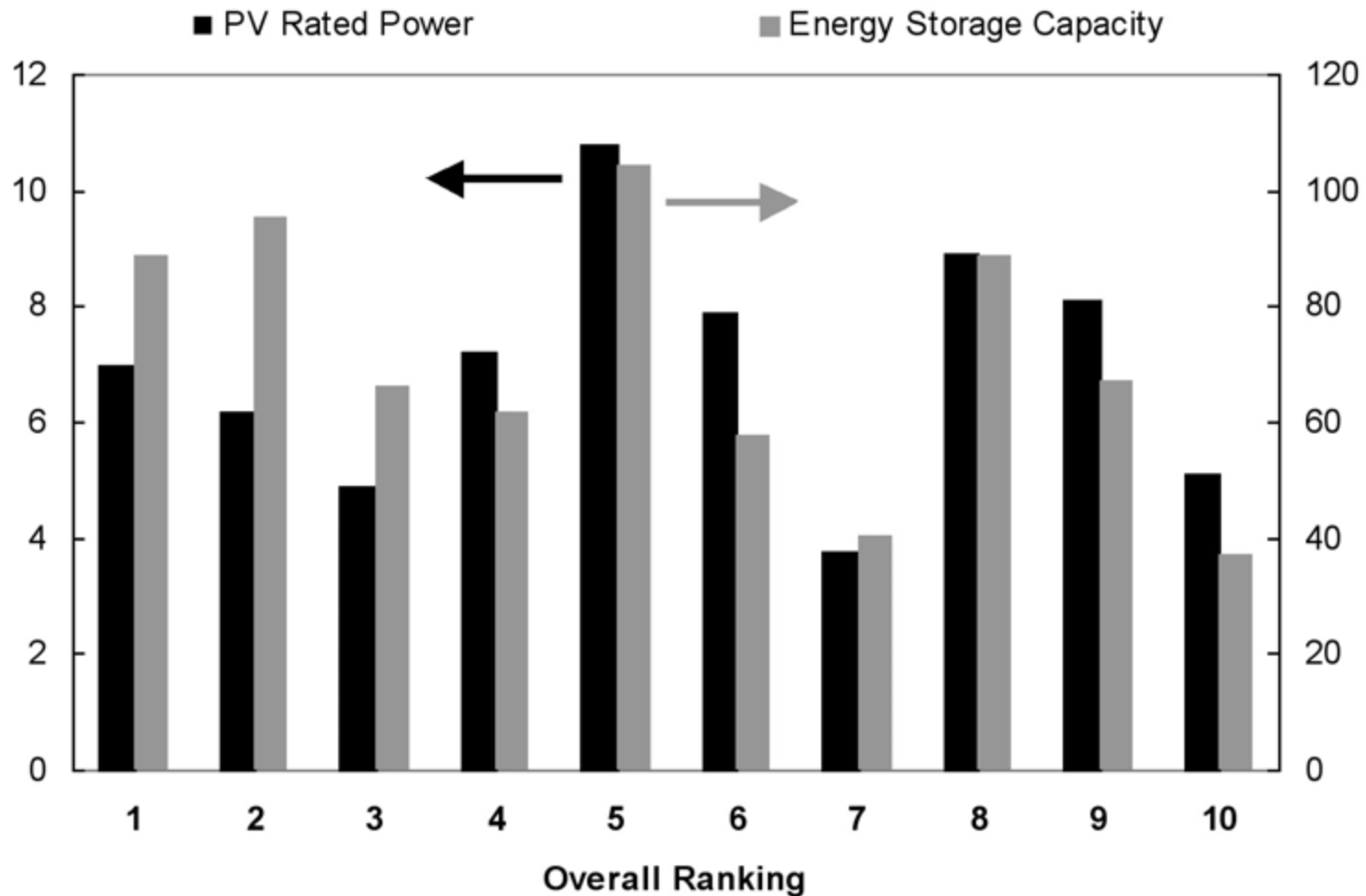
NYIT
High pres. Hydrogen
104.4 kWh

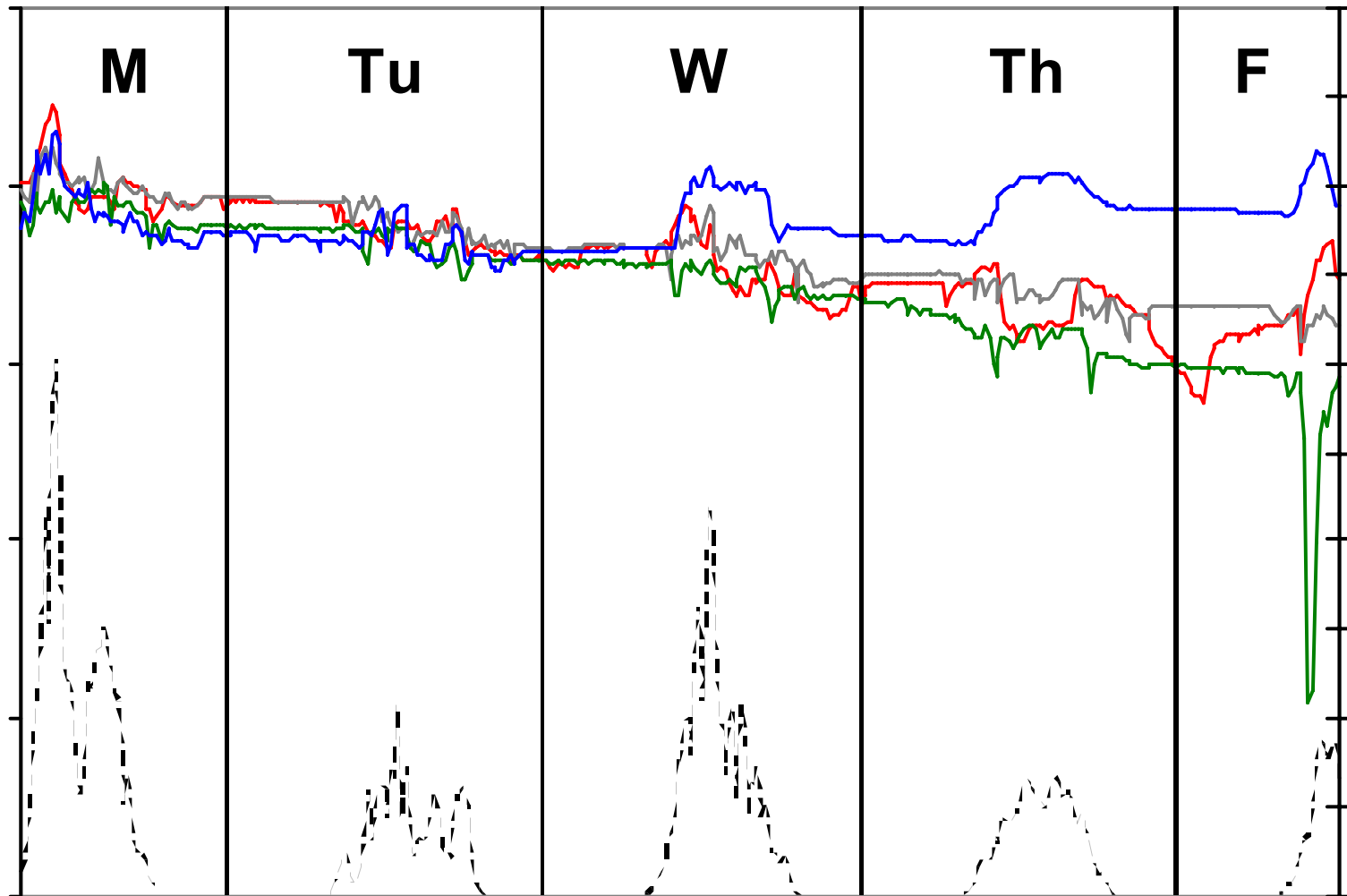


NYIT
Plug Power fuel cell
Proton H₂ gen.



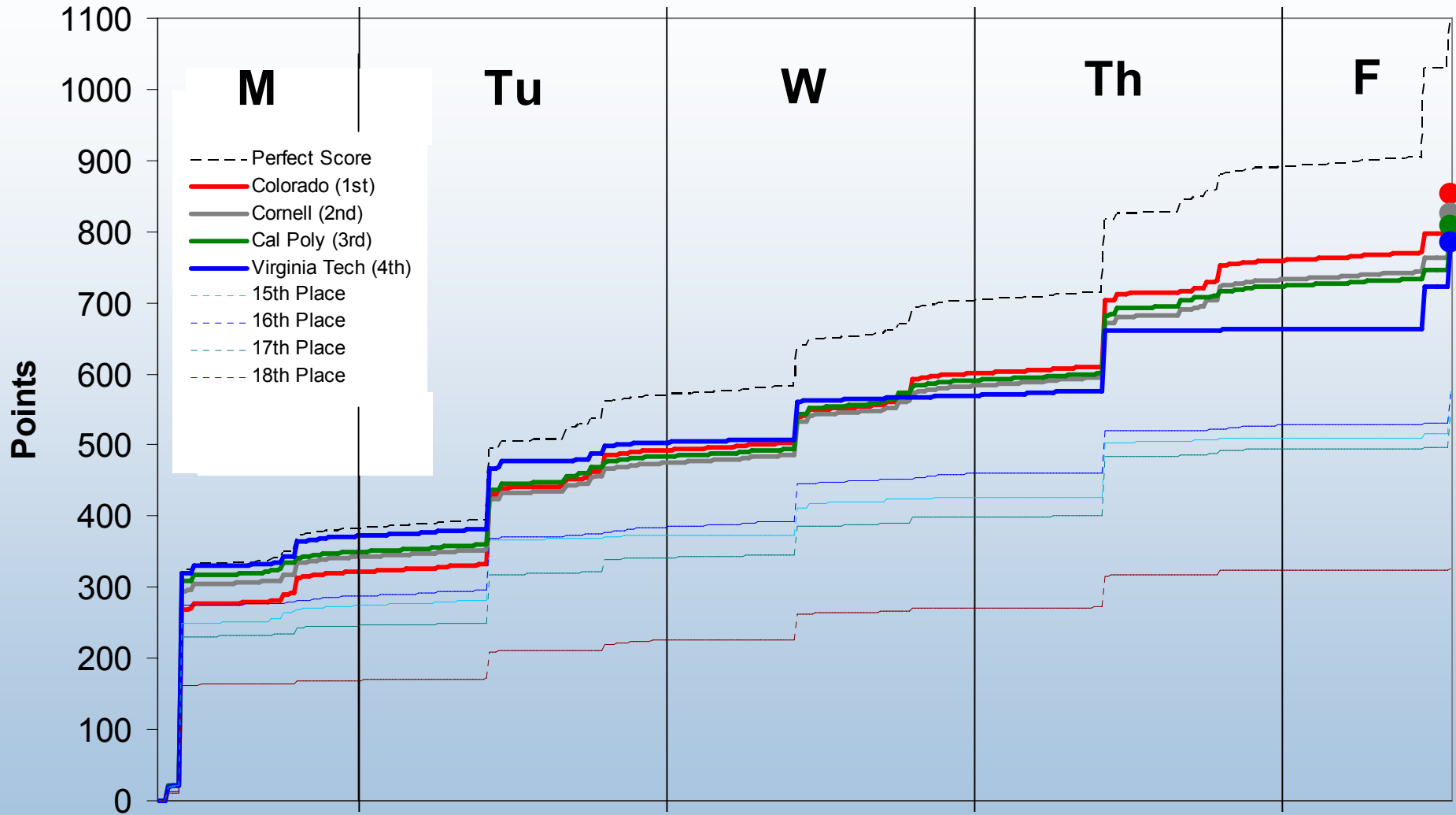
PV Capacity(kW) and Storage Size (kWh) vs. Overall Ranking





— Colorado (1st) — Cornell (2nd)
— Cal Poly (3rd) — Virginia Tech (4th)
- - - Solar Irradiance

2005 Solar Decathlon Scoring Chronology







Are the Solar Decathlon Rules and Measured Contests too Contrived or Unrealistic?

800 ft² maximum footprint

Grid-independent

Comfort Zone 100 pts

Appliances 100 pts

Hot Water 100 pts

Lighting 100 pts

Energy Balance 100 pts

Getting Around 100 pts







Independence Energy Homes



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IEH zero net-energy homes offer both grid-connected security and energy independence, all at a zero price premium.

IEH zero net-energy homes are designed to be grid-connected for two reasons. First, grid connectivity ensures that the home is supplied with electricity on severely cloudy days and at night. Second, grid connectivity