

WESTERN SOLUTIONS

Solar Thermal for Wade King Recreation Center

Brian Maskal · Stephen Harvey · Courtney Rondel

Proposal



+



= reducing CO₂ and meeting campus sustainability goals

- Climate Action Plan
 - WWU's goal of climate neutrality by 2050
- Dependent on fossil fuels
- 25% energy loss from natural gas/steam

Domestic Hot Water Consumption:

993 gallons a day:

- Natural Gas used: **1,235 therms/year**
- Cost of Natural Gas (\$0.46/therm): **\$568 per year**
- CO2 emissions: **14,452.8 lbs/year**

Example of Schüco Flat Plate Collectors

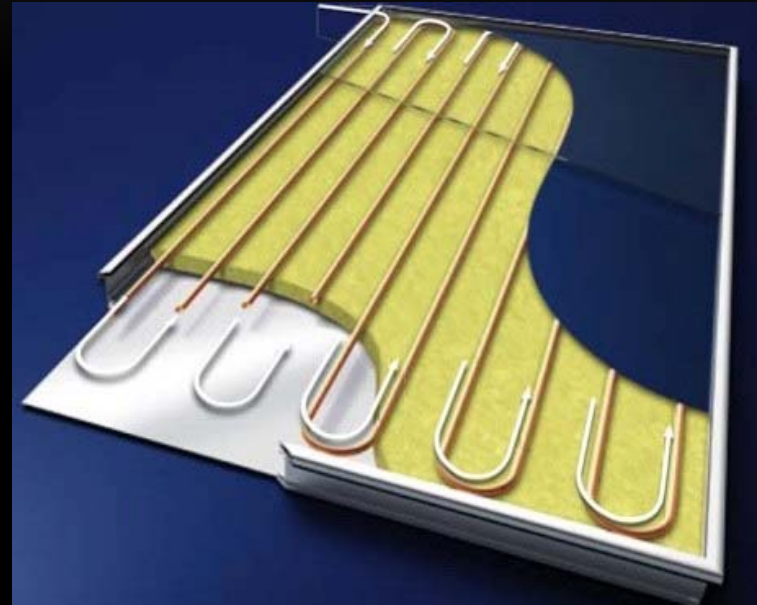


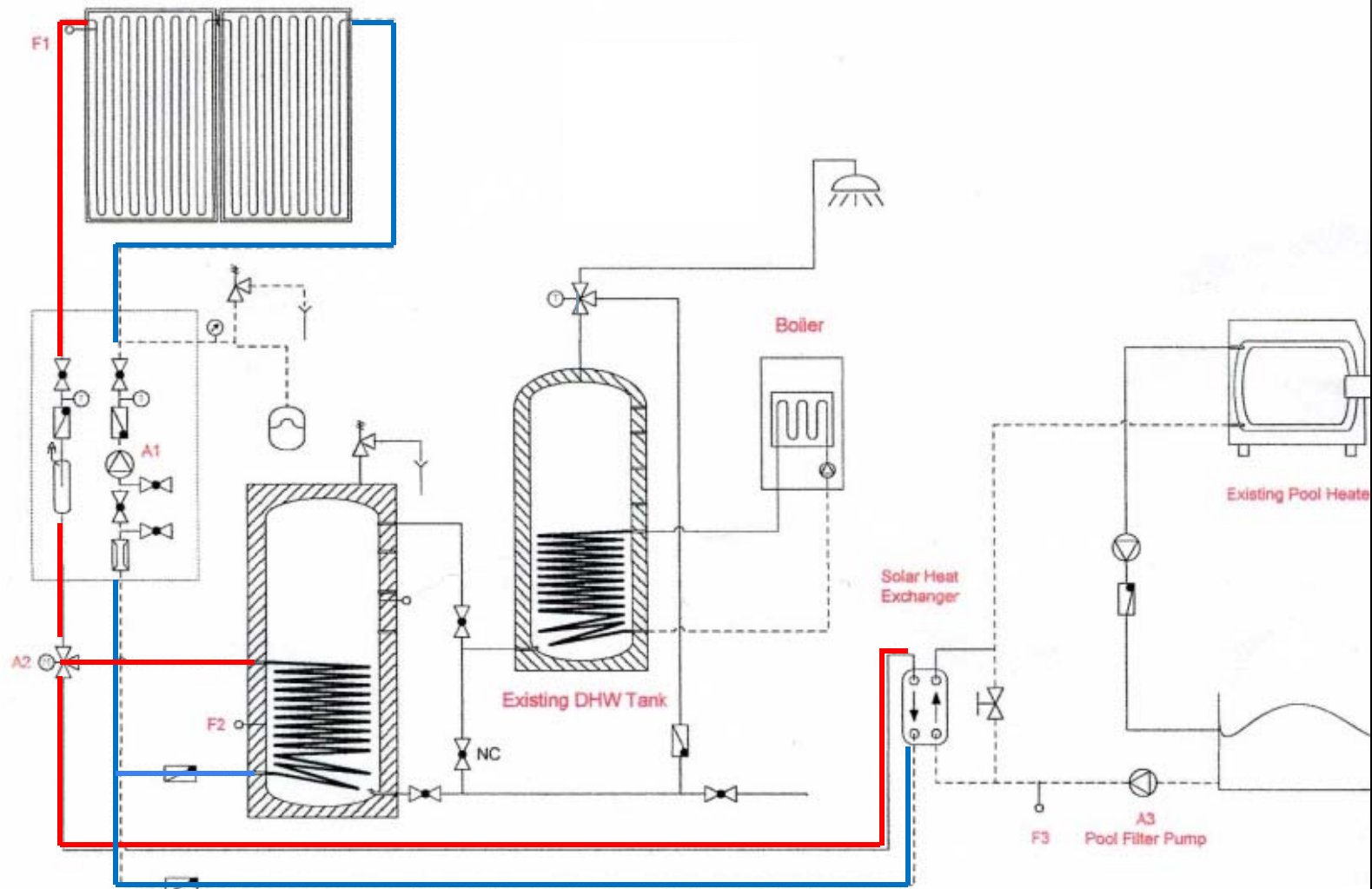
- Low maintenance
- Durable
- Avg. output of 16,666 btu/day/collector

Difference Between Panels



VS.

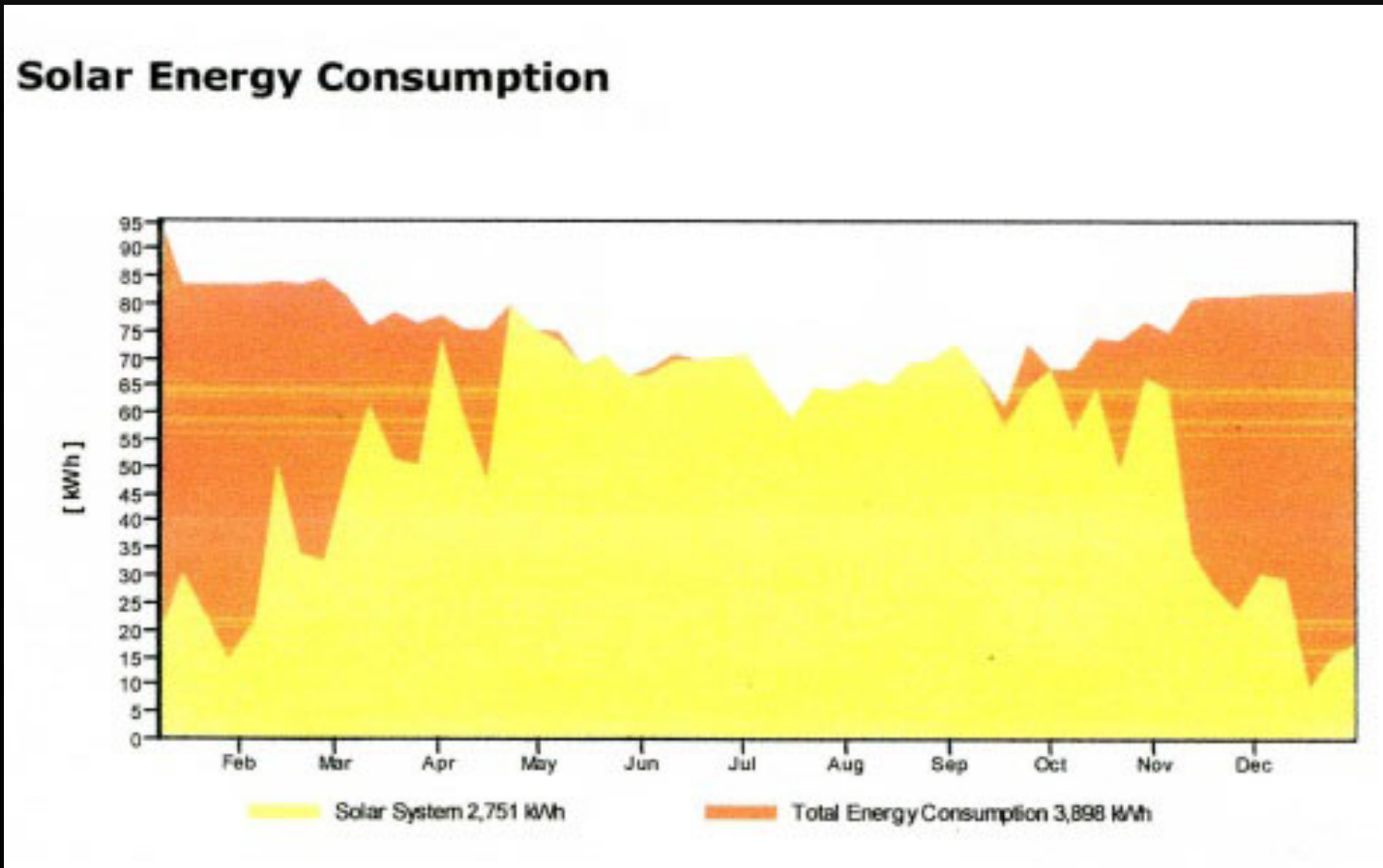




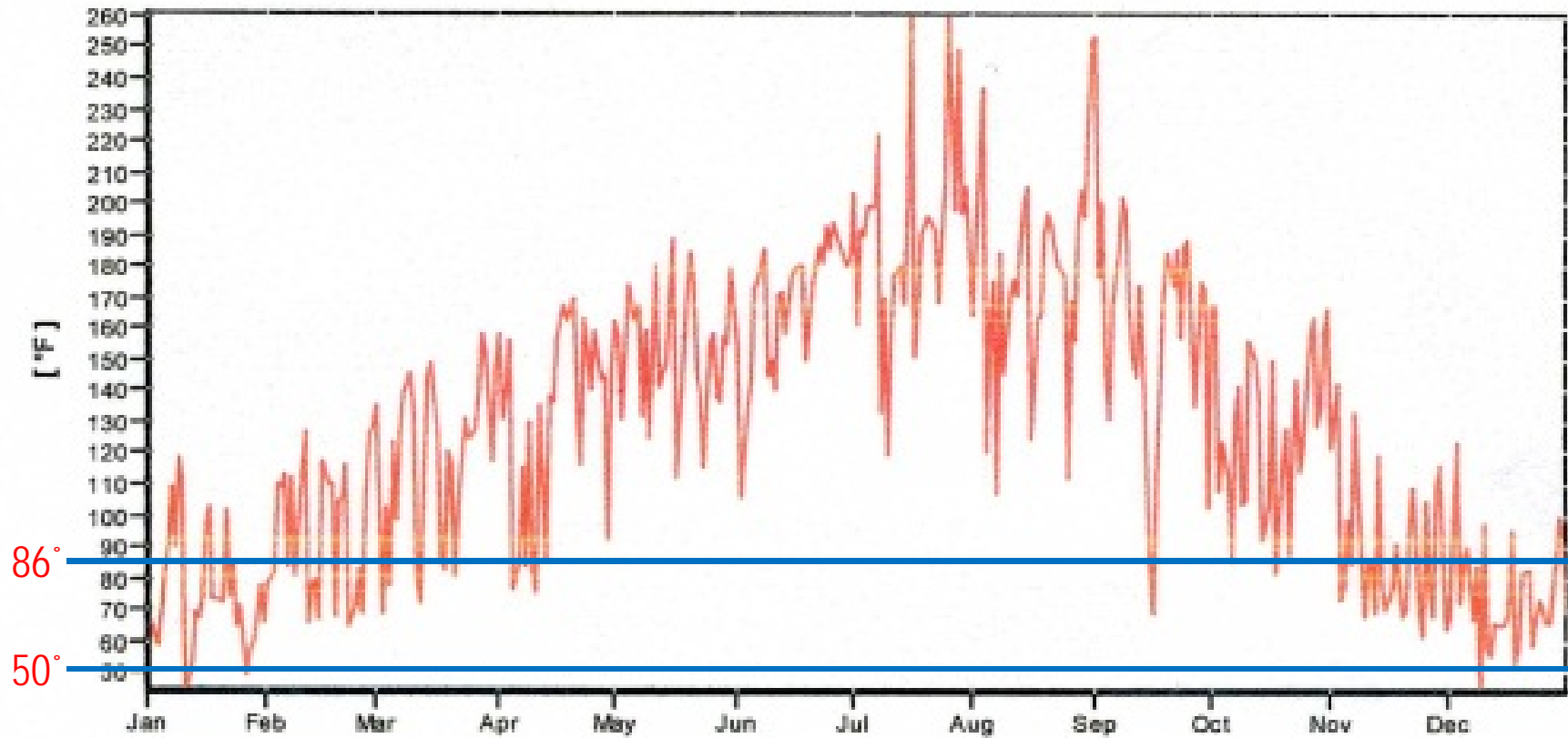
PROBLEM. **SOLUTION.** BUDGET. CONCLUSION.

Typical System Production in Seattle

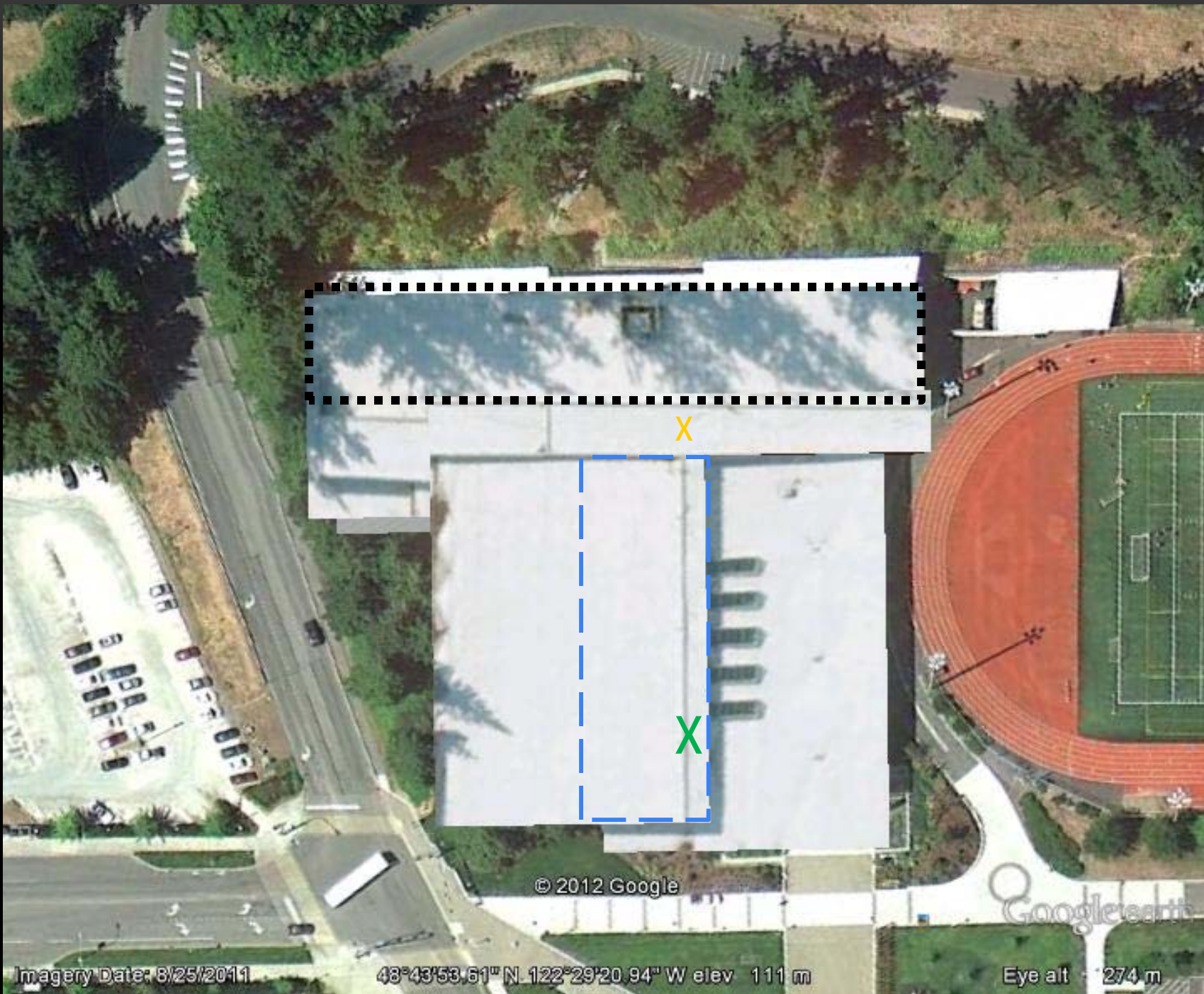
- Close to 100% solar thermal daytime energy production during Apr-Oct
- Around 35% annual dependency on natural gas



Daily Maximum Collector Temperature



PROBLEM. **SOLUTION.** BUDGET. CONCLUSION.



© 2012 Google

Google Earth

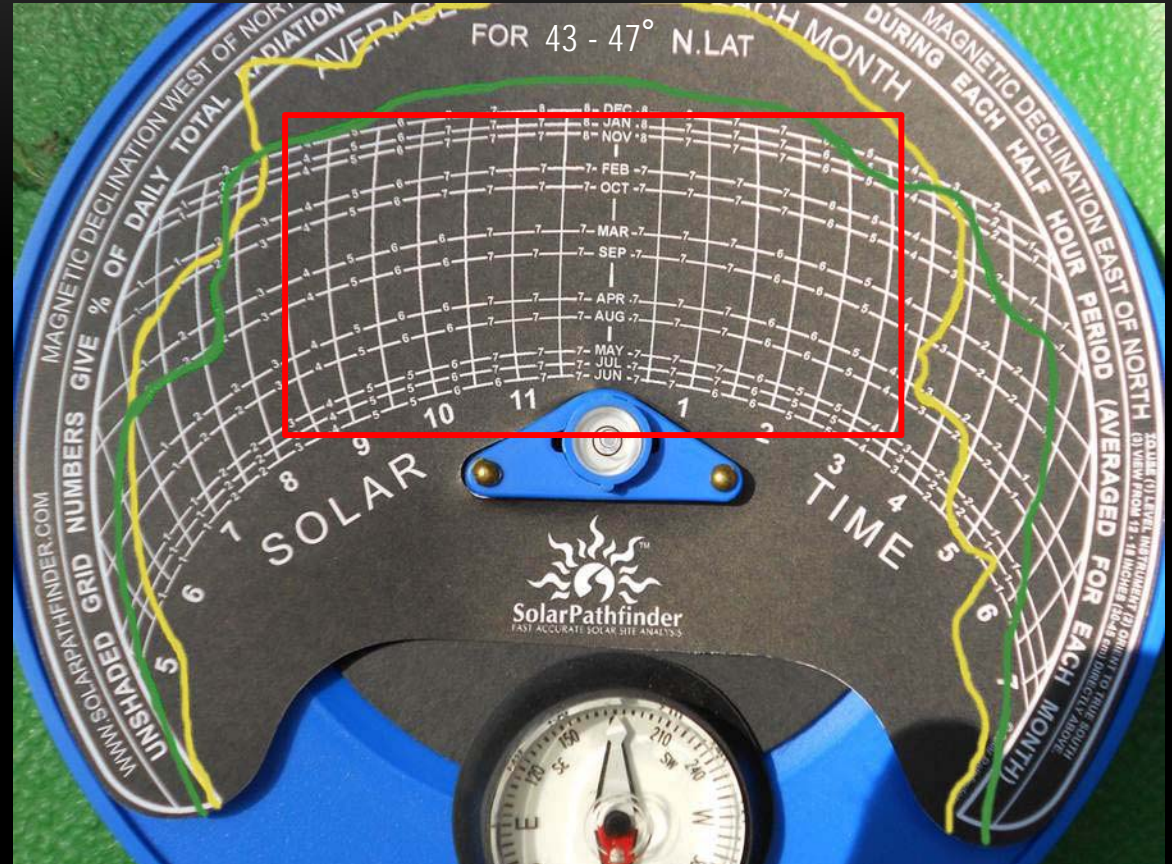
Imagery Date: 8/25/2011

48°43'53.61" N 122°29'20.94" W elev 111 m

Eye alt : 274 m

Solar Pathfinder

- Yellow line = West side of roof
- Green line = East side of roof



Educational Plan

- 91% of students use the recreation center
- Stopping point for campus tours
- Learning example for several majors
 - Energy, Materials Science, Engineering, Environmental Studies and Science
- Interior informational signage on how the system works and carbon savings.

Budget

45 collectors at \$3500 per collector (package purchased at commercial rate includes installation, engineering, permits, and plumbing.)

- ref. Western Solar

Estimated investment: \$157,500

	1 yr. with Natural Gas	1 yr. with Solar Thermal	10 yr. Savings with Solar Thermal
Cost of Gas	\$39,266	\$36,640	\$26,260
CO2 emitted	987,348lbs	893,363lbs	939,850lbs

Funding Options

- Wade King Recreation Center: 5 to 8 yr. payback period investment of
- Student Green Energy Fee Program
- Future grants: Washington Solar, others ?

Future Works/Research

- Number of collectors still to be determined

Overall Benefits

- Reduce carbon emissions
- Summer months can produce almost 100% daytime energy
- Moving toward WWU sustainability goals
- Influencing on renewable energy

Special thanks to:

Western Solar

Chris Hadley

Dale Zimbelman

Greg Hough

Adam Leonard

Sandy Fugami

Steve Morrow

Jason Sprinkle

Brad Johnson

Kathryn Freeman

The Sun

QUESTIONS OR COMMENTS?

