Orange County Public Schools

WINNER

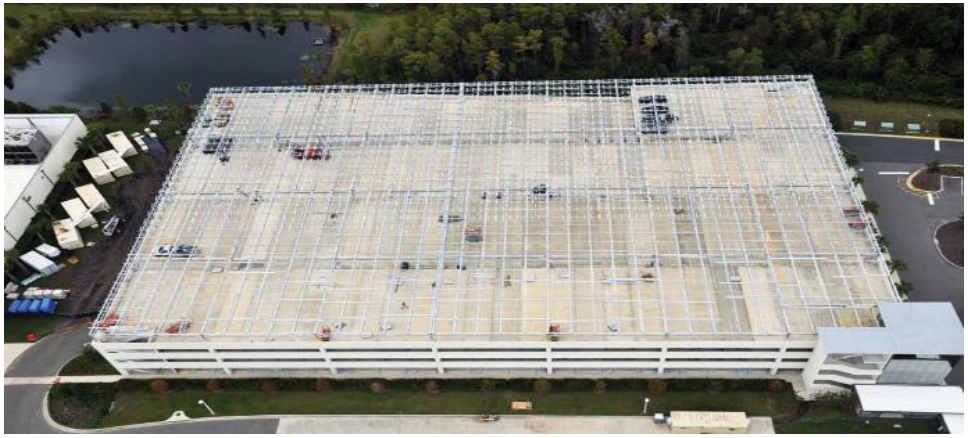
the broad prize for urban education

Solar Energy Presentation
May 12, 2016
Facilities Department

Going Solar

Why do organizations go solar?

- Save money
- STEM
- Triple Bottom Line
  - Environmental
  - Social
  - Economic



Structural Racking System

Darden Restaurant Headquarters - Orlando

Background

Solar Energy – Facilities Update on 12-15-14

- 10 active solar systems (7 Solar Electric & 3 Solar Thermal)
- Solar Leasing Agreements
- Solar Feed-in Tariffs

Solar Electric – Waterford ES

Solar Thermal – Westside Campus

Background

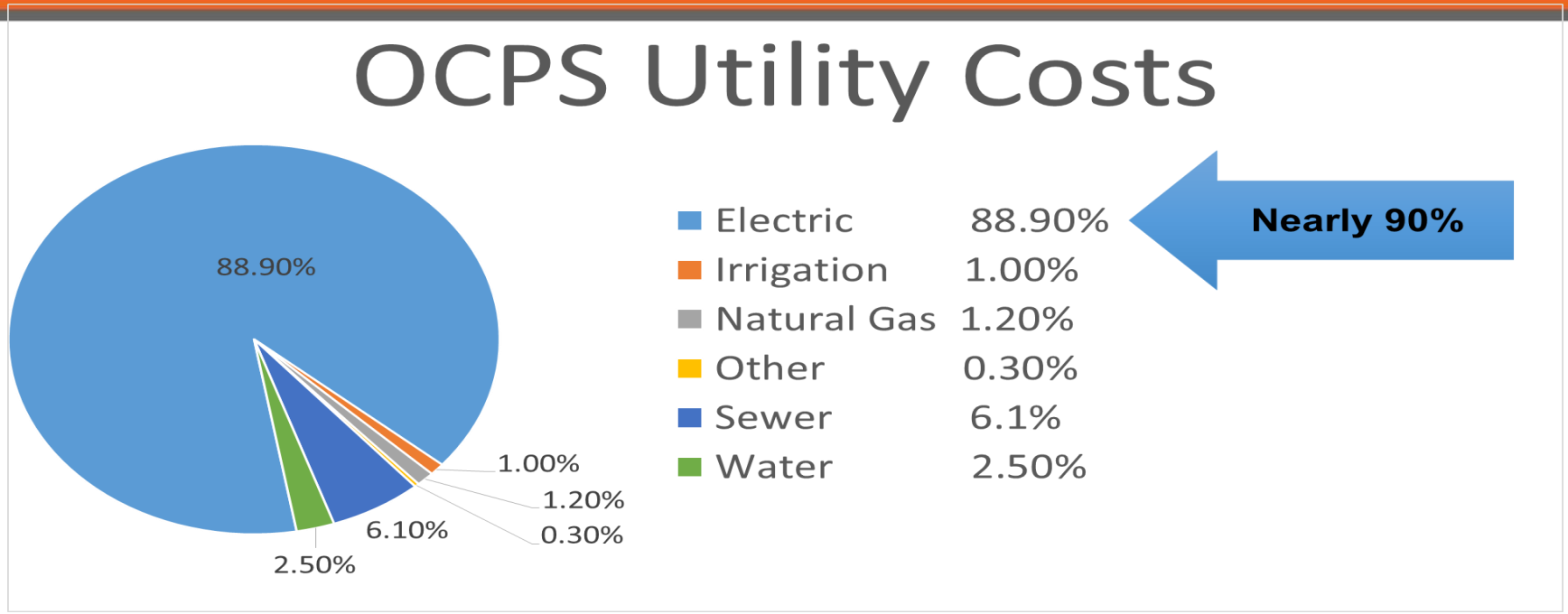
League of Women Voters

- Email sent to several Board Members on 1-20-16
  - Report called Brighter Future; A Study on Solar in Schools
  - Claims a Rise of Solar in K-12 Schools
  - Claims that Solar is underutilized
  - Provides STEM opportunities

- Public input received on 3-8-16
  - Florida ranks 16th as a Solar State
  - Prices for Solar have been plummeting
  - TECO – Tampa International Airport example
  - Encourage OCPS to consider a Solar Pilot

TECO – Tampa International Airport

Orange County Public Schools

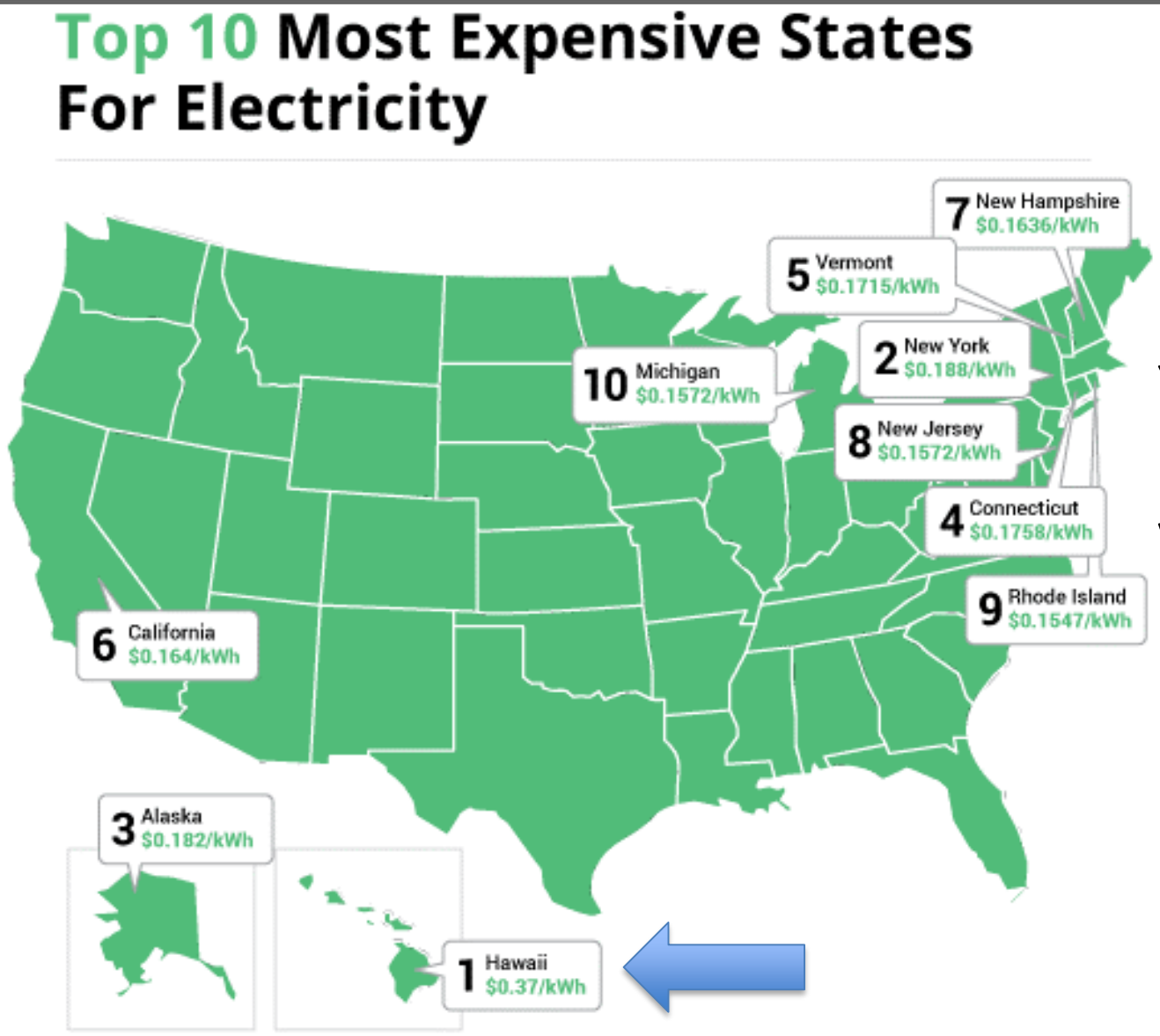


Current Power Rates:

- Duke Energy 11.0 cents per kWh
- OUC 10.0 cents per kWh

Average annual electrical costs for 2015

School Types	average annual KWh costs	average annual use
• Elementary Schools:	$135,795	1,224,764 kWh
• Middle Schools:	$ 273,776	2,538,173 kWh
• High Schools:	$ 623,441	5,594,133 kWh

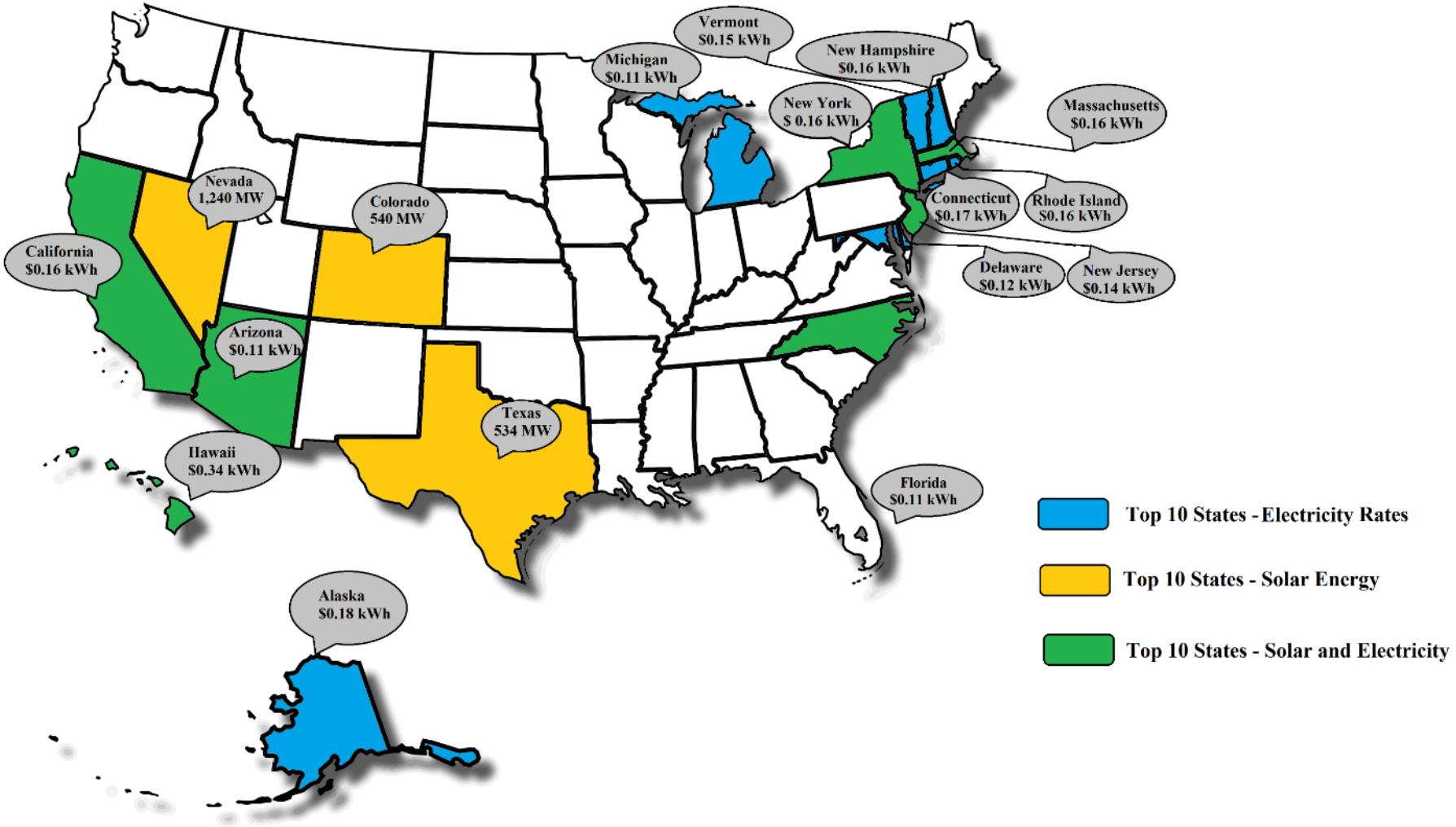


OCPS Electric rates for Fiscal Year 14/15 = $.105/kWh

Vs.

Hawaii at $.37/kWh

Top 10 – Electric Rates & Solar



Solar Energy Options

1. Roof-mounted vs. Ground-mounted Systems
2. Large PV Array
3. Smaller Demonstration Systems
4. Community Solar Arrays

Options

Roof-mounted Solar Electric Systems

- Roofing Warranties
- Roof integrity
- Roofing repairs
- Less expensive installation
- Less vulnerable to malicious mischief

Headquarter Honda – Clermont, FL

Roof-ballasted System

Options

Ground-mounted Solar Electric Systems

- Acreage
- Increased liability
- Higher installation costs
- Higher Maintenance Costs

Solar Energy Case Study #1

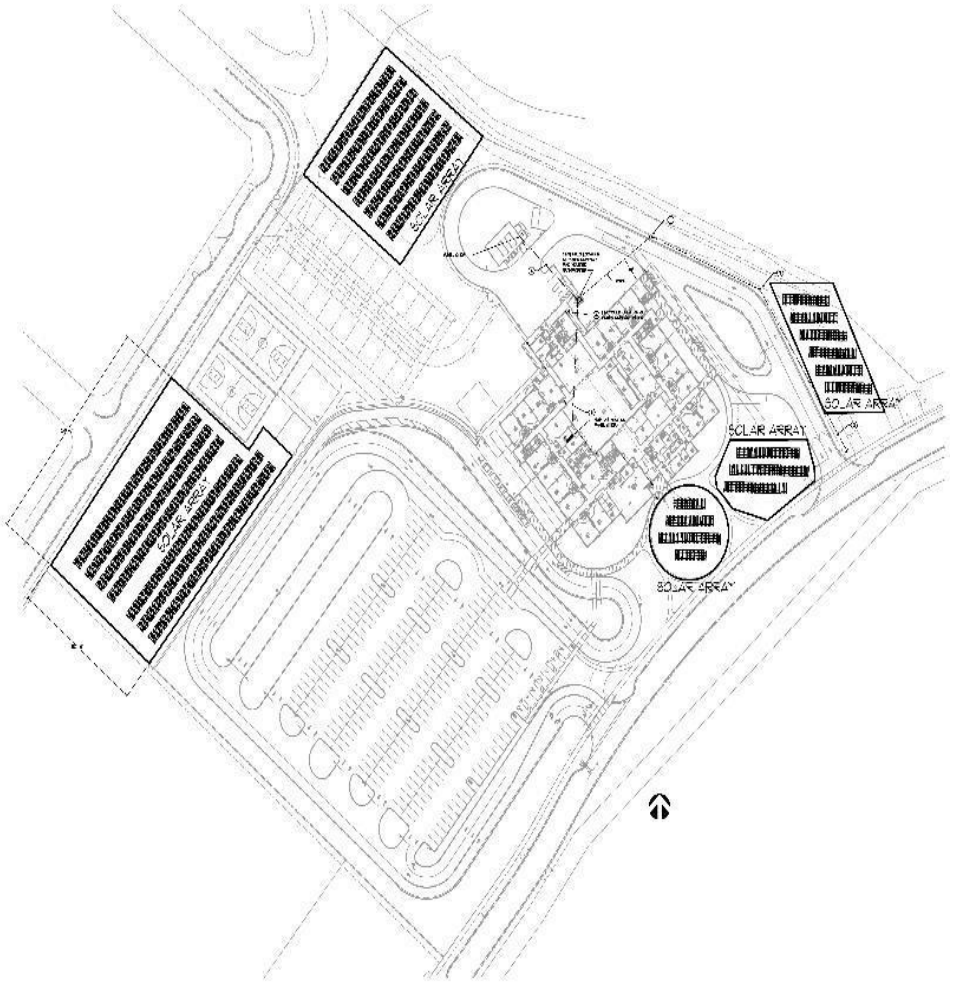
Independence ES

Roof

- The multilevel roof creates shaded areas, which reduces the efficiency of the solar system.

Ground

- 825 KW to 1,000 KW
- 2.5 acres of ground space to accommodate 2,640 solar panels
- $3.4 to $6 million dollars, $4 to $6/watt installed
- Estimated return on investment, 21 to 27 years
- 10 years warranty for inverters, 20 years warranty for solar panels
- 1% per year degradation



Solar Energy Case Study #2

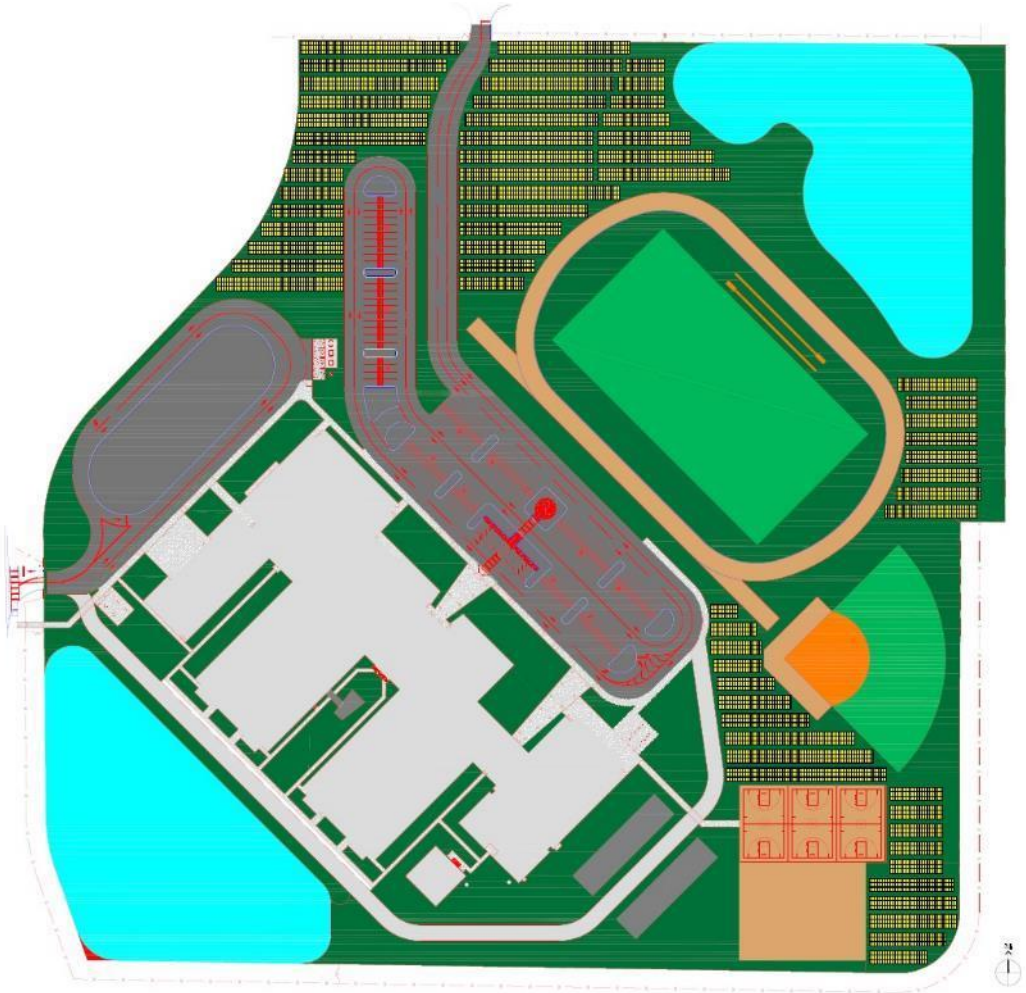
Carver MS Replacement

Roof

- Solar system too large to fit completely on roof space

Ground

- 1,533 KW to 2,000 KW
- 5.5 acres of ground space to accommodate 6,456 solar panels
- $6 to $8.5 million dollars, $4/watt installed
- Estimated return on investment, 19 to 24 years
- Inverter 10 year warranty, panels 20 years
- 1% per year degradation



Orange County Public Schools

Small scale demonstration solar systems.

OCPS has 10 small scale solar energy systems

-7 solar electric

Duke Energy	KWh in FY14/15
Lake Sybelia ES	3,092
Olympia HS	2,624
Orla Vista ES	1,419
OTC Westside-Bldg 3	2,705
OTC Westside-Bldg 13	2,961
OTC Westside-Bldg 6	1,429
Waterford ES	2,932
OUC	
Robinswood MS	1,590
Colonial HS	1,752

Solar Hot water Systems	KWh savings/year
OTC Westside	$255
Sand Lake ES	$255
Zellwood ES	$255

OTC – Westside Campus

Solar Hot Water

Solar Electric

Options Continued

Participate in a Community Solar Farm

- The Stanton Solar Farm is a Power Purchase Agreement with Duke/OUC – 5.9 MW
- Gardenia was the first community array offered by OUC – 400 kW
- OUC intends to offer another community array – 12 MW
- This array would be owned and operated by OUC
- Participants would receive a 5-year Rate Lock
- OCPS continues to work with OUC to define potential participation

The Stanton Solar Farm

Gardenia Community Solar Farm

Direct & Third Party Ownership Options

1. Direct Ownership
   - Qualified Energy Conservation Bonds (QECB)
   - Bake Sale Model
   - Do-it Yourself Model
   - Solar Schools Programs

2. Third Party Ownership
   - Power Purchase Agreements
   - Public –Private Partnerships
   - Operating Party Lease Agreement
   - Hosting Agreement

Next Steps

1. Continue discussions with OUC to participate in a Community Solar Farm
2. Continue discussions with Duke Energy and OUC to install smaller demonstration systems via a Hosting Agreement
3. Continue to review installation of a large array.

Accomplishments

1. Energy Rebate Program – Nearly $2M
2. Duke Energy Power Partner Award in 2014
3. AEE Corporate Energy Management Award in 2014
4. Metro Plan Orlando Clean Air Award in 2014
5. Florida Green School Award, District-level Award in 2014
6. Florida Green School Award, Silver-level District in 2015
7. Green Ribbon Schools Award, District-level Florida Nominee in 2015
8. Green Ribbon Schools Award, District-level Florida Awardee in 2016
9. OCPS Green Schools Recognition Program
10. Completion of several energy-efficiency projects

Superintendent's Comments

School Board Questions and Discussion