Department of Engineering

Messiah College

the Collaboratory for strategic partnerships and applied research

Energy Group

SOLAR PV SYSTEM FOR THE THEOLOGICAL COLLEGE OF ZIMBABWE

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CLIENT

- Theological College of Zimbabwe (TCZ)

http://tcz.co.zw/

DEFINITION OF PROBLEM

- The Theological College of Zimbabwe has problems with unreliable power from the electric grid.

- Power goes out roughly 40 times a week

http://buildipedia.com/images/masterformat/Channels/Operations/Electricity_Transmission/Transmission_Lines.jpg\

PROPOSED SOLUTION

- Photovoltaic System
  - Computer Lab
  - Library

http://www.varnvillefbc.org/library.html

SUPPLIER SELECTION

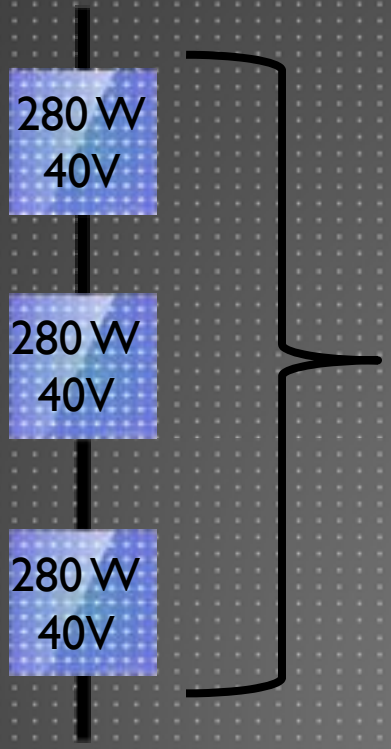
VS

http://advancedsolarindustries.com/
http://africanenergy.com/

SYSTEM REQUIREMENTS

- Enough Energy for a day
  - 6.5 kW System
- Enough Storage for overnight
  - 1000 Ah Capacity
- Component Interaction
  - 48 V Battery Bank

ACTUAL SOLAR ARRAY DESIGN



Charge controller
Max Input Voltage = 145V

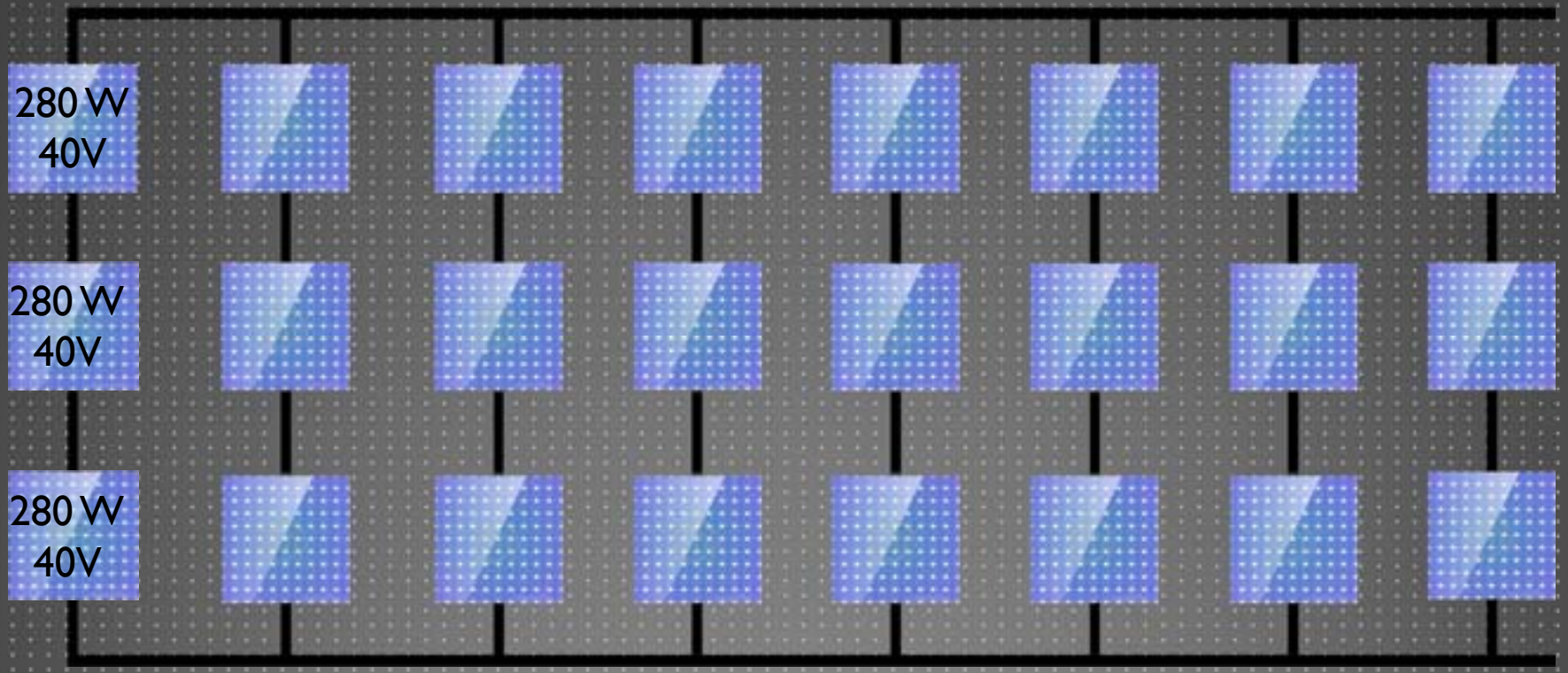
145V / 40V = 3.6 Panels in a String

6500W / 280W = 23.2 panels

SUNTECH

http://www.selasenergy.gr/images/logos/Suntech_Logo_4C_white.jpg

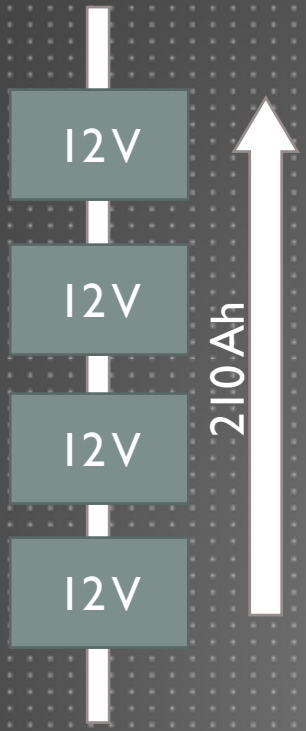
ACTUAL SOLAR ARRAY DESIGN



SUNTECH

http://www.selasenergy.gr/images/logos/Suntech_Logo_4C_white.jpg

ACTUAL BATTERY BANK DESIGN

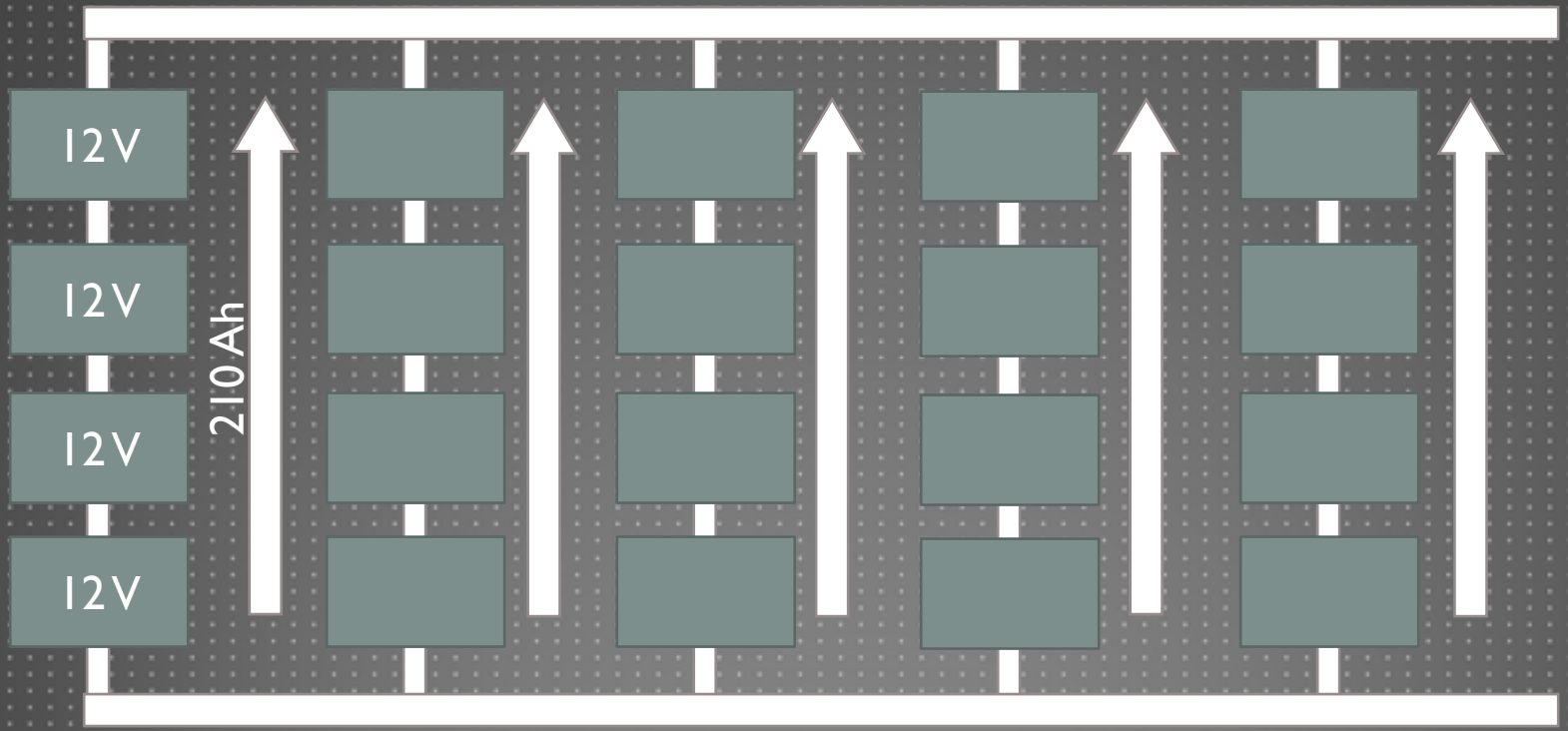


1000 Ah / 210 Ah = 4.76 Strings

http://www.amerescosolar.com/sites/default/files/styles/large/public/8G4D_LTP.jpg?itok=fVxjiNE-
http://www.autofashiongy.com/wp-content/gallery/brands/deka_logo.jpg

ACTUAL BATTERY BANK DESIGN

210 * 5 =1050 Ah



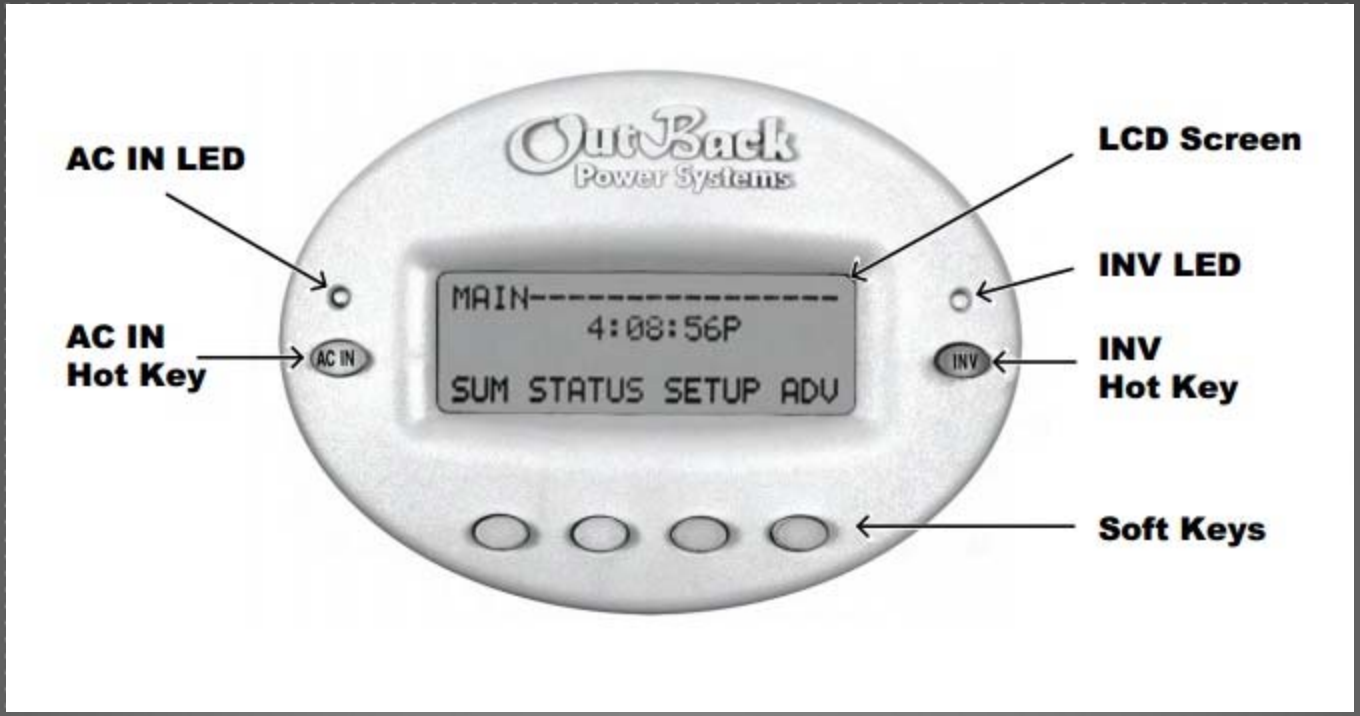
http://www.amerescosolar.com/sites/default/files/styles/large/public/8G4D_LTP.jpg?itok=fVxjiNE-
http://www.autofashiongy.com/wp-content/gallery/brands/deka_logo.jpg

OUTBACK COMPONENTS

OutBack Power Systems™

http://advm2.com/wp-content/uploads/2010/05/outback-logo_color1.jpg?w=300
http://sunelec.com/shop/image/cache/data/Outback/outback-power-flexmax-fm80-80-amp-mppt-charge-controller-64-800x800.jpg
http://solarprofessional.com/sites/default/files/articles/images/16_Inverter---OutBack-GVFX_0.jpg

MATE



https://ironedison.com/images/products/Outback/Mates.jpg

SOURCE PRIORITY

http://www.clipartbest.com/cliparts/9iz/n7b/9izn7bAiE.jpeg
http://www.uvm.edu/~uvmpr/images/features/pylonsunset_430x300.jpg
http://www.preparednesspro.com/wp-content/uploads/2012/06/solar_cells_panels_array_monocrystaline.jpg
http://products.bigfrogmountain.com/shop/images/P/DEKA%208G31.jpg

FUTURE PLANS

- Purchasing Components
- Site Team Planning
- Installation – May 2015

ACKNOWLEDGEMENTS

- Theological College of Zimbabwe
- Dillsburg Brethren In Christ Church
- Advanced Solar Industries
- The Collaboratory for Strategic Partnerships and Applied Research
- Messiah College ‘s Department of Engineering
- Advisors: Dr. Randall Fish and Liam Tanis
- Solar PV project team members

QUESTIONS