



ITS Alaska January 22, 2015



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SESA - Who we are



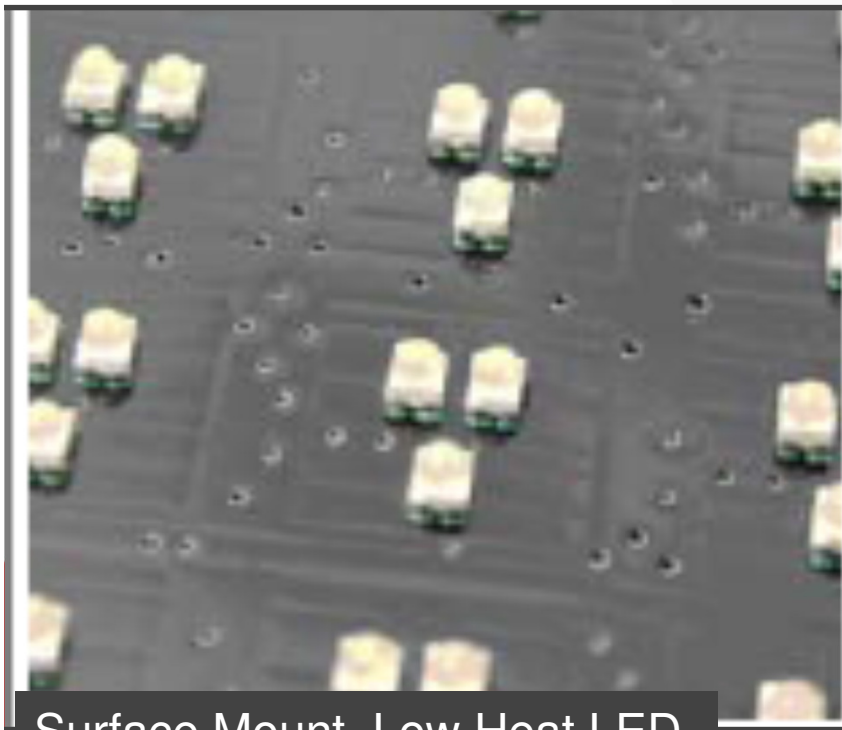
- ✓ Advancing technologies- Solar, Energy efficiencies, No cooling, etc.
- ✓ Service driven business model
- ✓ Full DMS Capabilities
- ✓ Niche Market Specialties



SESA -Who we are



Advancing technologies



Surface Mount, Low Heat LED

- ✓ **Full DMS**- Color, all access, energy efficient
- ✓ **SolarSign**-Only integrated solar power provider in all sizes.
- ✓ **Blank out signs**, MUTCD / custom
- ✓ **Retrofitting** old, out of date signs.
- ✓ **Special programs**
 - ✓ Wrong way
 - ✓ Limited view
 - ✓ Weather related
 - ✓ Travel time systems
- ✓ **Energy Efficiencies**- up to 90% less than Traditional LED's.



MassDOT
Regional Travel Time
Management system
“Go Time”



MassDOT “Go Time” Pilot initiative

- Boston to Provincetown highway 6, high seasonal travel
- No Fiber Optic/ Com
- Message: travel time and warnings
- Solar Autonomy: 21 to 30 days
- 12 locations on route
- 2 additional Bluetooth locations



MassDOT 'Go-Time' Travel Warning



- ▲ 3 Full Size DMS
- ▲ 3 Locations
- ▲ 21 Days
Autonomy
- ▲ 8 batteries
- ▲ 900 watt solar
panel

MassDOT 'Go-Time' Travel Time



- ▲ 24 Travel Time DMS
- ▲ 9 Locations
- ▲ Fully Solar Powered
- ▲ 30 Days Autonomy
- ▲ 2 signs / 6 batteries/
900 watts of solar
panel
- ▲ 3 signs / 8 batteries

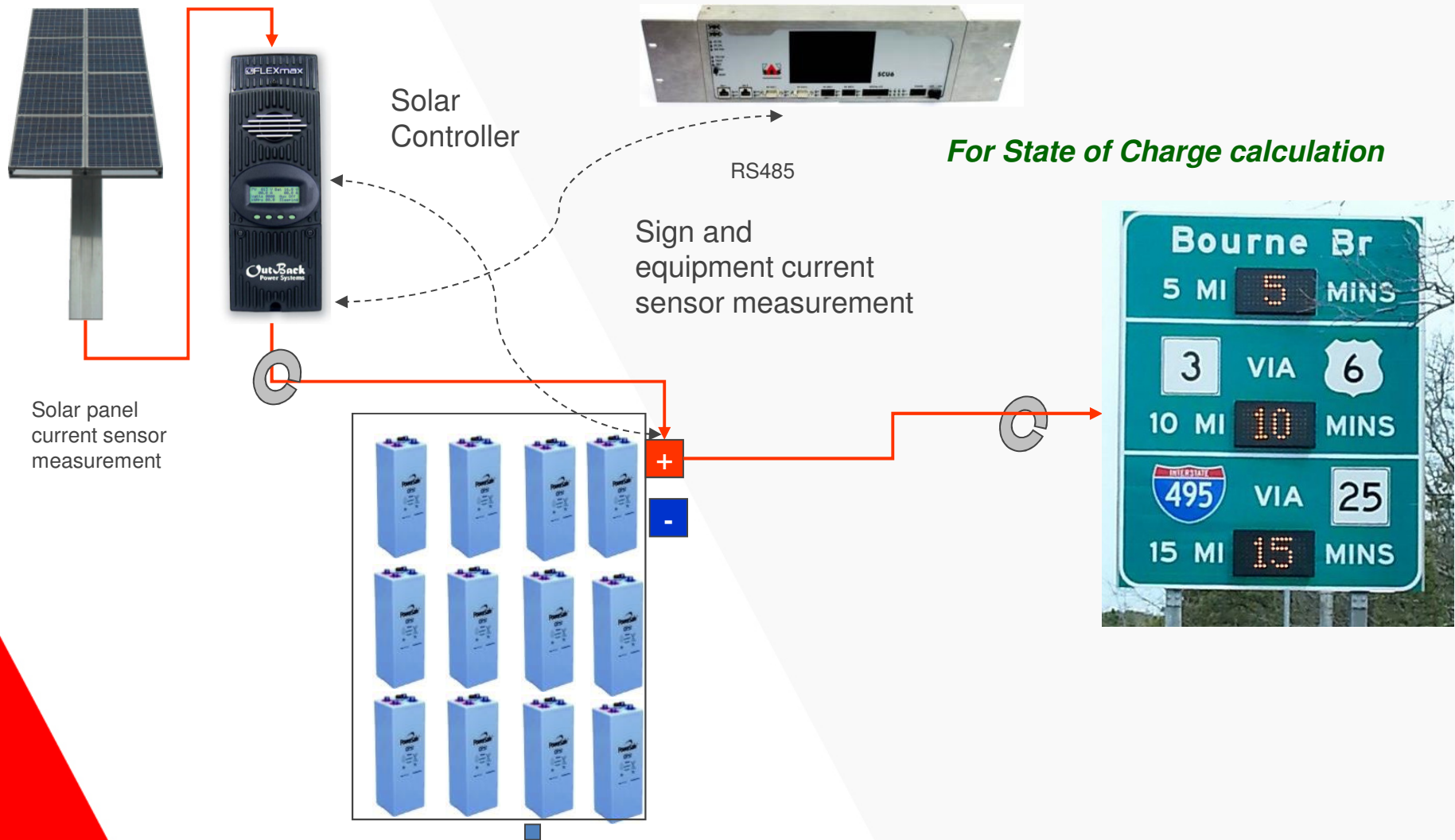
Tilting Mechanism



(Pictured: 4° Tilting)

- ▲ Custom Adjustable Housing
- ▲ 2° - 15° Tilting Angle
- ▲ Ultra Slim Profile

Solar Technology



Solar Chain Components – Charge Controller



- **Protect the entire solar system**
- **Charge controllers allow optimum power output voltage.**
- **15-30% more power output from the panels**
- **Monitor power input to battery / batteries to sign**

Solar Chain Components – Batteries



- ▲ The batteries Absorbent Glass mat
- ▲ Life span 5-10 years
- ▲ Insulated cabinet with 2" polystyrene

Lessons Learned

➤ Exact Specifications

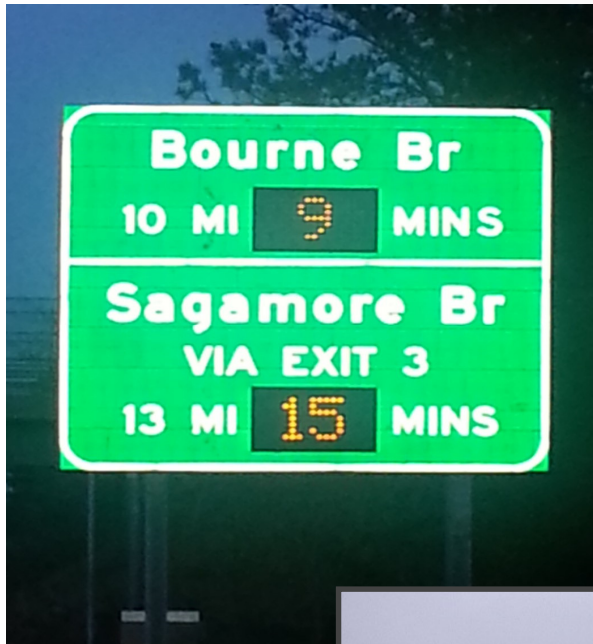
- Sign performance needs
Amount of use
- Establish autonomy standards
Base point of assessment
Maintenance standards
- Understand communication needs

➤ Contractor Solar Experience

Testing North facing
panels at 52 degree
Latitude



Statewide Solar travel time program, 2015



- ▲ Deployment on both 2 and 4 lane roads
- ▲ 137 Travel Time locations
- ▲ 131 Bluetooth locations
- ▲ Both 4 lane and 2 lane routes





The Solar Chain

Solar Chain Components – Charge Controller

Protect battery from over charge

- ▲ Known as high voltage disconnect (HVD)
- ▲ Limits charging voltage
- ▲ Important with all sealed batteries

Prevent reverse current condition

(Current flowing back into the panels at night)

Protect battery from over discharge

- ▲ Known as low voltage disconnect (LVD)
- ▲ Disconnects the battery from the load when the battery reaches a certain depth of discharge

Solar Chain Components – PV Panels

PV=Photovoltaic (solar panel)

We choose our panels based on their size and efficiency. 15%-16% efficient is very good according to industry standards.

300 Watt PV Panels/24vdc.

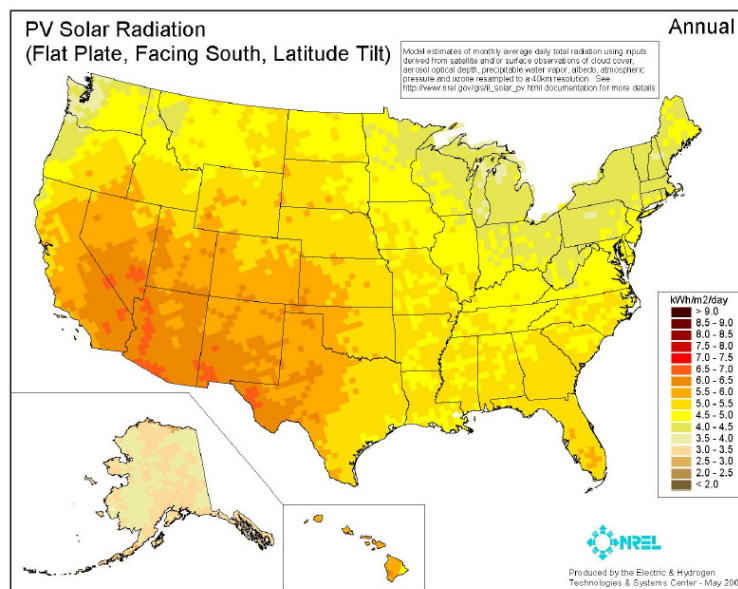
Shading

Just one small spot of shade on a panel will cause the output to drop by 1/3rd, and if the shade spreads across the panel you will lose all output power.

This is caused by the way the cells are wired in the panel. A shade survey should be done onsite during the survey.

The Solar Chain - Calculations

US Solar Radiation



- ▲ Determine the power needed-load analysis
- ▲ Type of battery and size- watt hours
- ▲ Calculate how much sun the site will receive
- ▲ PV array sizing-size and amount of solar panels needed

The Solar Chain - Calculations



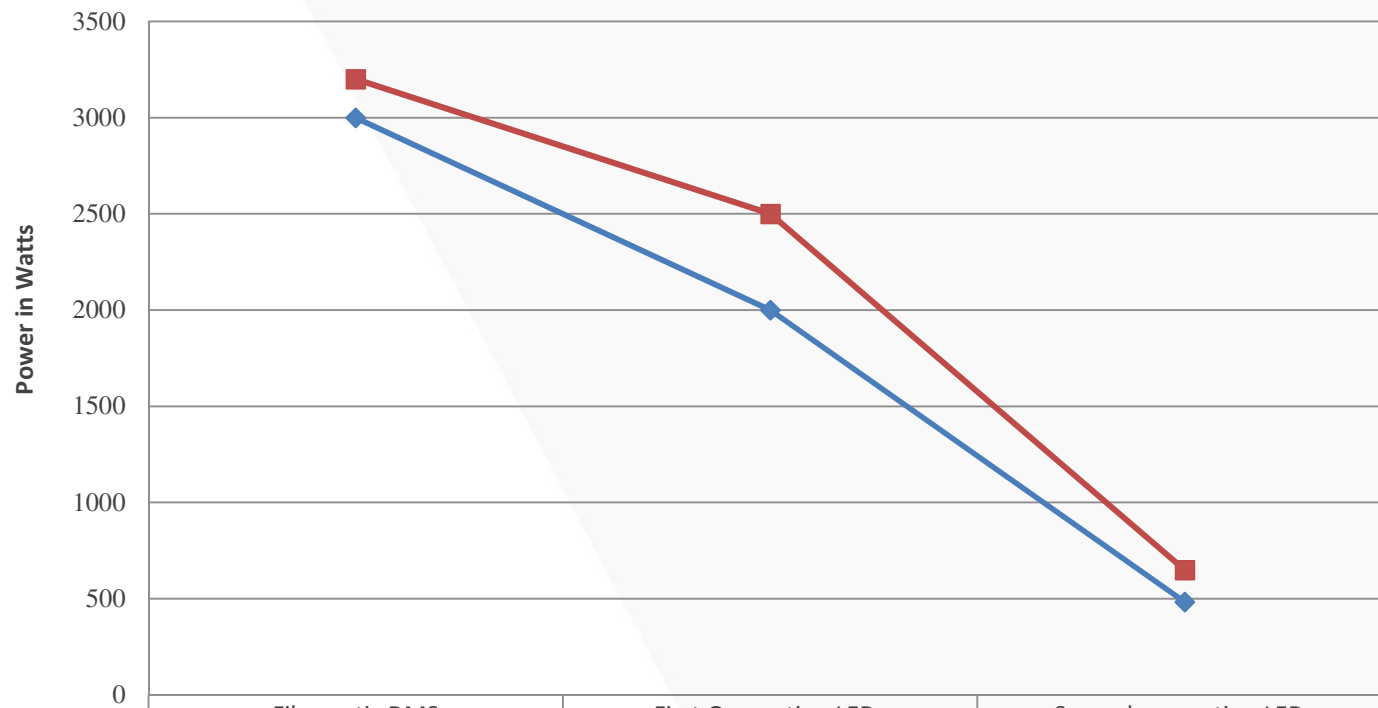
- ▲ We size our PV panels to meet the load requirements during the worst month, while accounting for losses in output.
- ▲ Array voltage must be higher than nominal battery bank voltage to charge effectively. For example a 12vdc battery will need a minimum of 14.4vdc to charge it, 20vdc is required to charge the 12vdc battery reliably. Typical charge efficiency is 85-90%.



Solar DMS

DMS Power Consumption Trend

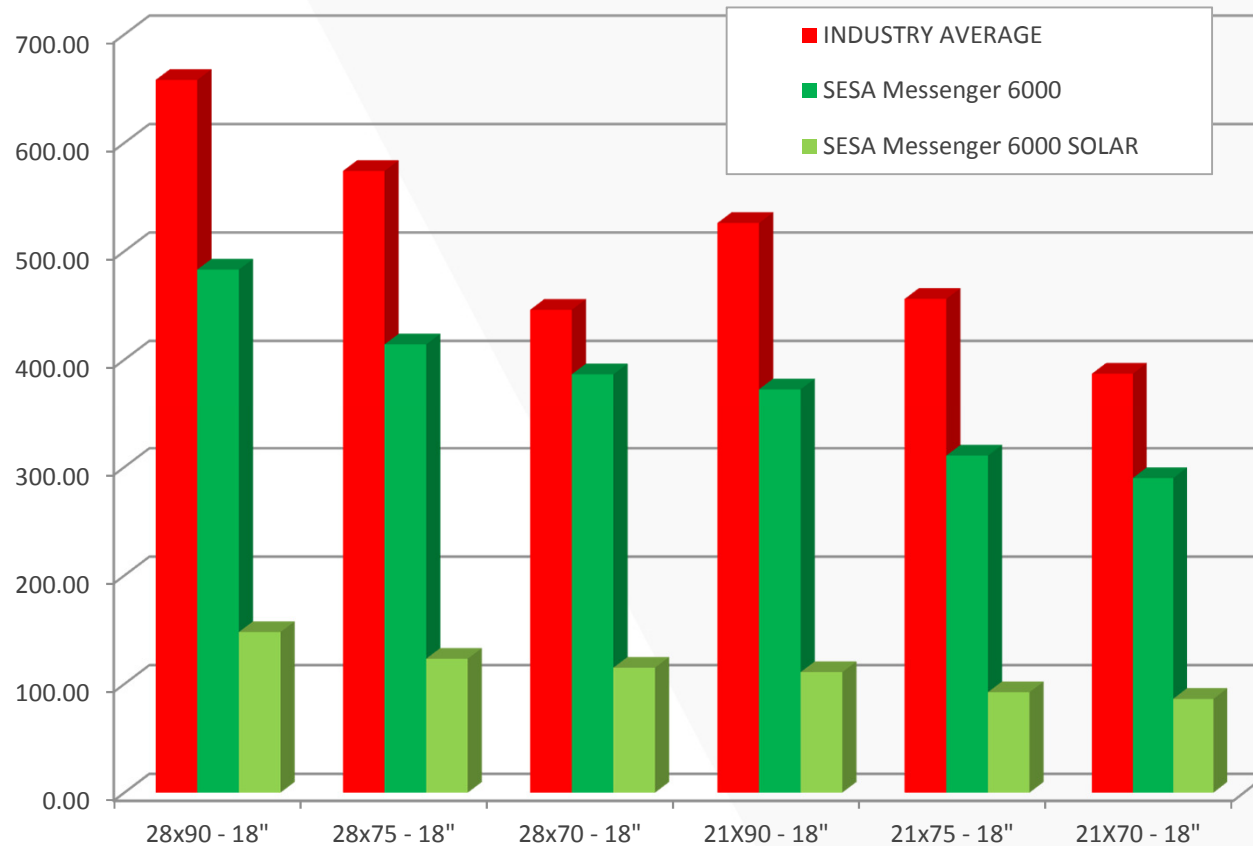
DMS Power Consumption Trend: Less Energy Consumption – Better Performance



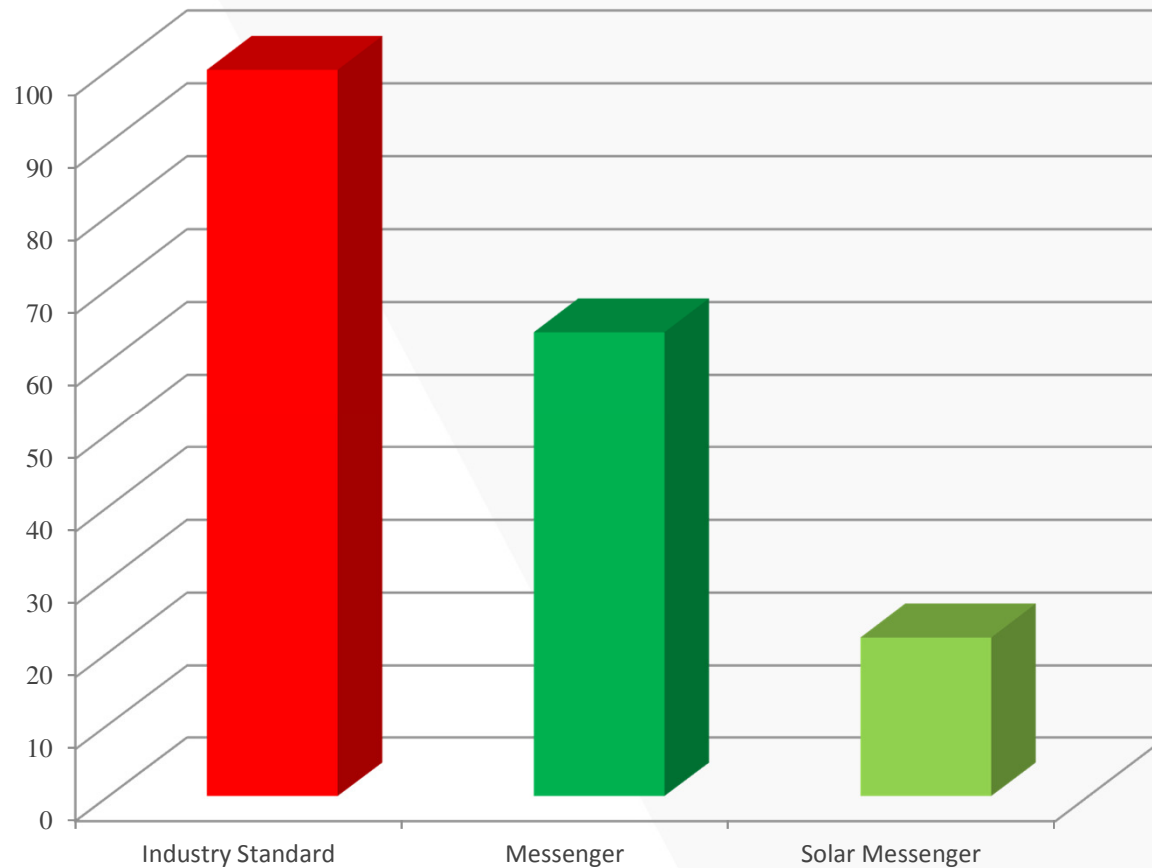
	Fiberoptic DMS	First Generation LEDs	Second generation LEDs
3 Lines 15 Char 18"	3000	2000	483
3 Lines 18 Char 18"	3200	2500	650

Full Size DMS Energy Consumption

SES America Full Size DMS are much more efficient than industry standard



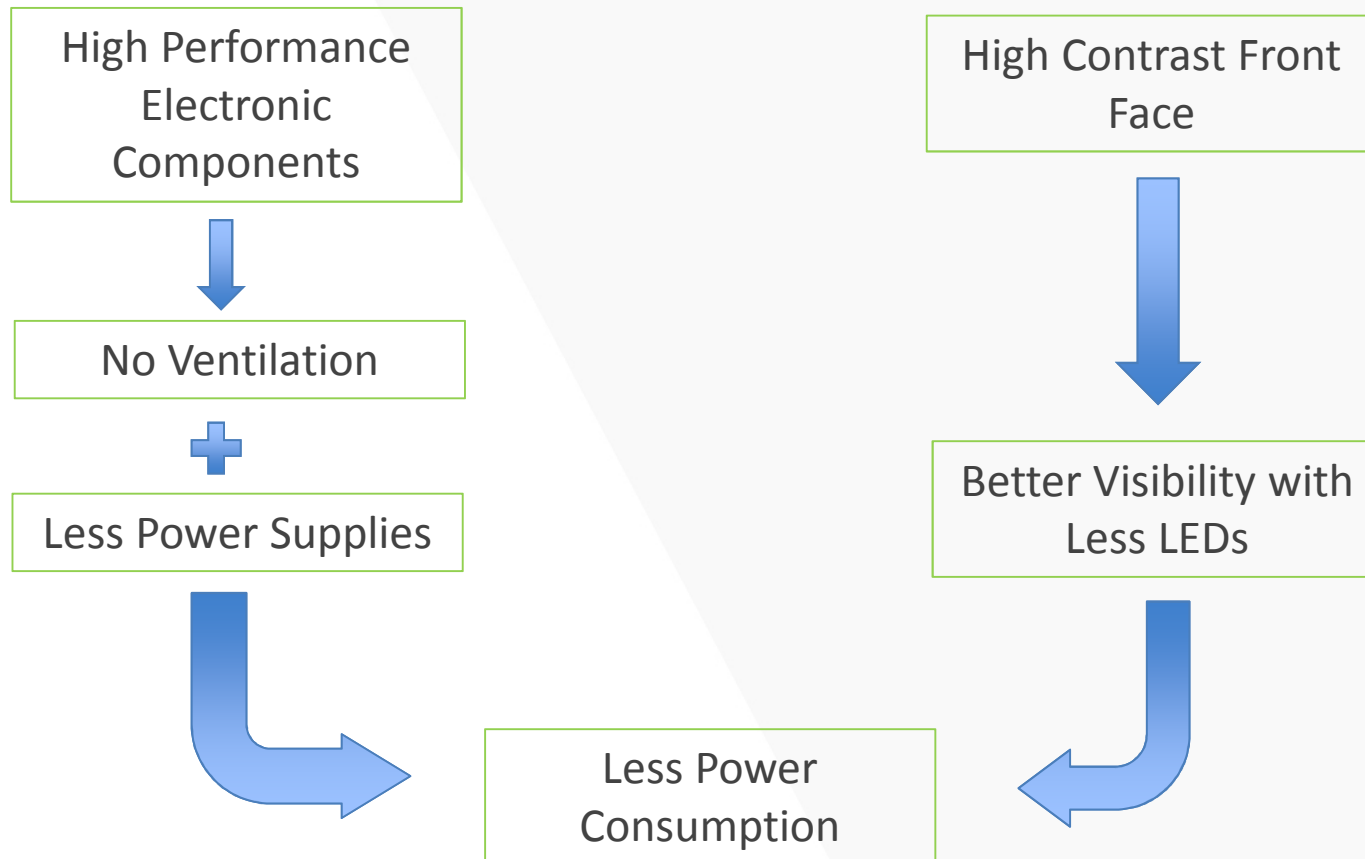
Embedded DMS Energy Consumption



- ▲ Messenger Series is 36% more efficient than industry standard
- ▲ Solar Messenger Series is 4.5 times more efficient than industry standard

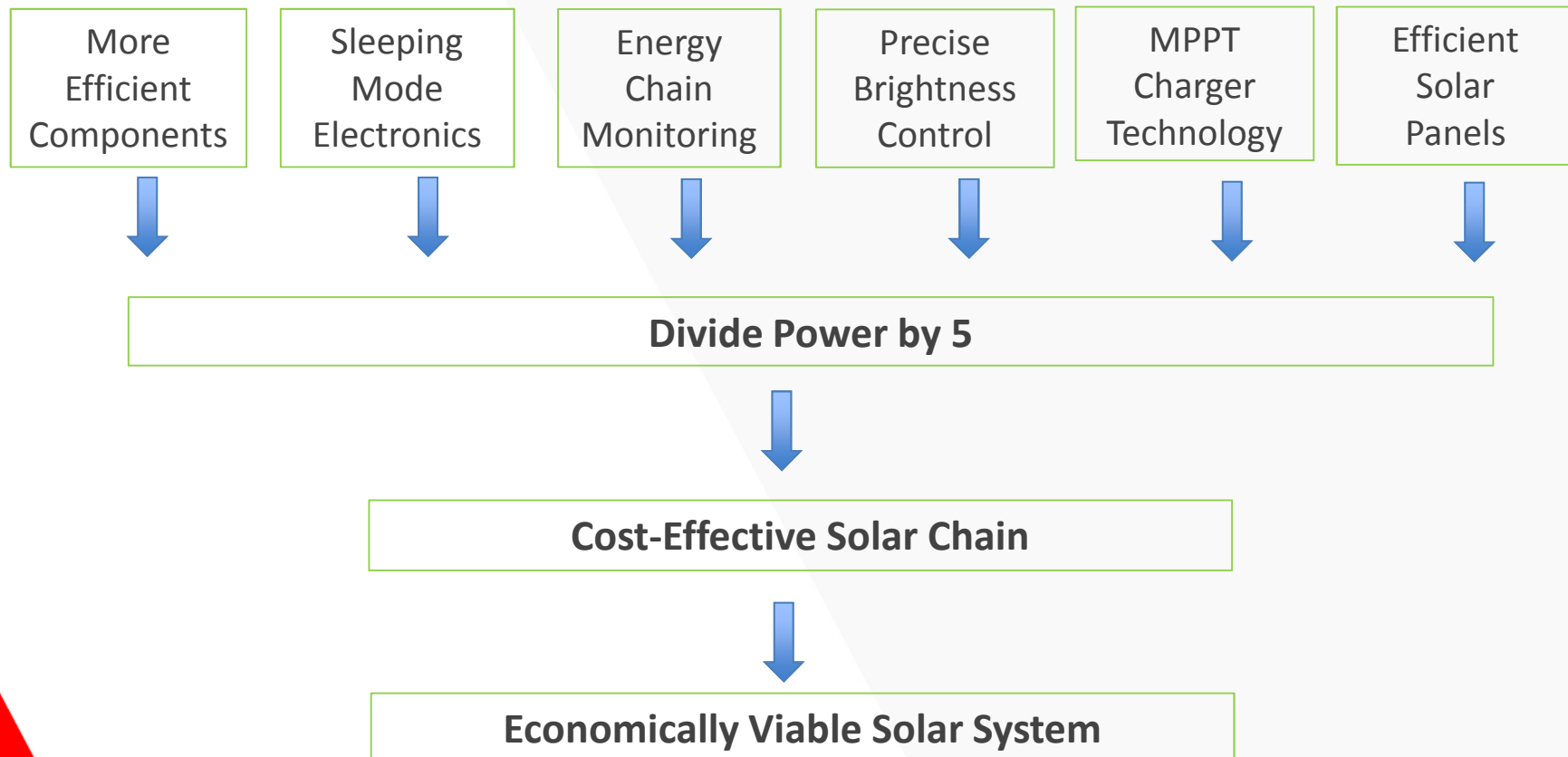
SESA DMS Efficiency – Messenger Series

Energy Efficiency is the Consequence of Years of Research & Development



SESA DMS Efficiency – Solar Series

Next Level Efficiency For Solar Applications



Solar Full Size DMS (M6000)

- ▲ 24/7/365 Full Functionality
- ▲ Fully Autonomous
- ▲ Customizable Sizes/Configurations
- ▲ NEMA Rated Housing
- ▲ Front Access, Rear Access, Walk-In
- ▲ SESA Solar Site Survey

Solar Task-Specific DMS (M5000)



- ▲ Customizable Sizes/Configurations
- ▲ Embedded (Static DMS)
- ▲ Amber, White, Full Color LEDs
- ▲ NEMA Rated Housing
- ▲ Front Access

Solar M5000 w/Tilting Mechanism





Contact Information

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