

For the project entitled for Team Rapid-Deployment Solar:

CROSS – 20', 40' Container Roll-Out/Rapid-Deployment Solar System: MILITARY GRADE LOW PROFILE VARIOUS TILT ANGLES HIGH POWER DENSITY PER CONTAINER RELOCATABLE solar systems = SAVE LIVES

Abstract: US Department of Defense (DoD) case studies revealed that **electricity** accounted for up to **70% of fuel use on operations**, and in some cases at a cost of almost **US\$400 per gallon** and **many lives in war areas**. When discussed these results with some of its resource sector clients, they cited similar examples of the cost of fuel for their international mining operations and in disaster areas where fuel had to be airlifted in. The recent **hurricane Dorian** category 4 storm that came through the Bahamas 2019, and the hurricane **Maria** category 4 storm that came through Puerto Rico in 2017 where a **large percentage of the island** has **no power for a long time** and **many deaths were the result**.

Integration engineering is the **innovation** and the **key** to integrate different **existing** and **developing new technologies** are a **real technological challenge** to meet the **renewable energy needs** of the **friendly military forces**, **1st responder agencies**, and **private contractors**, **companies world-wide** and the accompanying and environmental prerogatives.

CROSS was evaluated and deployed at NATO (North Atlantic Treaty Organization) Corps Warfighting – Exercise 'Arcade Fusion 2019' Cornwall, England with multinational troops from the Allied Rapid Reaction Corps (ARRC). This is the largest exercise of its kind since the cold war to show ability, unity and awesome power of NATO before the **NATO SUMMIT 2019 & NATO's 70th anniversary** in **LONDON, England** on **12/4/2019** where attended by all head-of-states from NATO. <https://www.facebook.com/AlliedRapidReactionCorps/videos/2545214682411092/>

The **CROSS platform** was chosen by **NATO ARRC** because - **Container Roll-Out/Rapid-Deployment Solar System. Unmatched as never before without precedent innovative**, the Container Roll-Out Solar System (CROSS) is **the world first & only: military grade, & low profile, & various tilt angles, & high power density per container, & Expandable & mobile** factory **assembled relocatable solar array** that **can be quickly and safely assemble & de-assemble over and over again at any site**.

The **Team** is targeting to **integrate existing** and **developing new technologies** to improve: **We can make CROSS much better!**

- **greater than > +25% power density per solar container and corresponding BESS**
 - **Bi-facial solar panels** from Solar Inventions (Solar Prize 1 winner)
 - **Integrated permanent aluminum ground albedo.** Military grade, light-weight aluminum sheet, according to study gives greater than > 85% albedo reflection.
- **more than > +20% lighter in transport weight,**
 - **Lighter but strong structure components for CROSS and BESS**
- **decrease install time by 50%**
 - **Efficient wiring technologies**

TECHNICAL ASSISTANCE REQUESTS: For the project entitled:

HARDWARE:

- (1) Evaluating and Testing for power output comparison of highest power density Solar Inventions' bi-facial panels vs. mono PERC half-cell / interdigitated-back-contact (IBC) panels in the CROSS platforms with permanent aluminum sheet for ground albedo.
 - The top 2 best mono PERC half-cell, IBC solar panel manufacturers in 2020 ranked based on the highest efficiency power density solar panels.

VS.

- The top 2 best bi-facial solar panels with highest power density watt/panel.

Mono- PERC Half-cell,
Back Contact Cell (IBC)



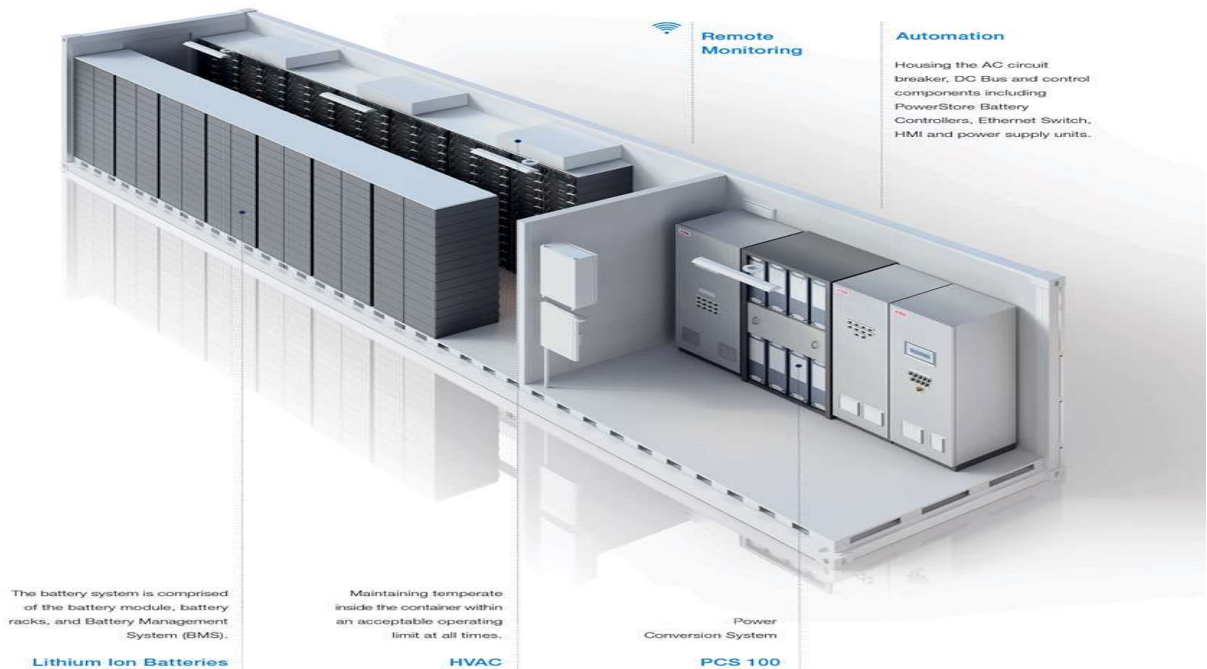
VS.

Solar Inventions' Bifacial



- (2) Evaluating and testing for lighter strong military grade components to decrease transport weigh

- (3) Evaluating and testing for more efficient wiring technologies - decrease # connections, decrease # fuses, quick release connections, organize efficient wire management/storage system.
- (4) Evaluating and Testing for best Battery Energy Storage System (BESS) system from USA companies - Stand-Alone military grade containerized BESS for mobile/rapid-deployment (in shipping container) compatibility to CROSS platforms.



INTEGRATION:

- (5) Integration of new components to existing platform or improvement to platform



SOFTWARE:

- (6) Software development for integration and monitoring of CROSS+BESS control/data
- (7) Software development for compatibility with outside infrastructure control/data management