



Sandia  
National  
Laboratories

SAND2019-1925C

# Defense & Disaster Deployable Turbine (D3T)

DWEA Conference, February 28, 2019



PRESENTED BY

Brian Naughton

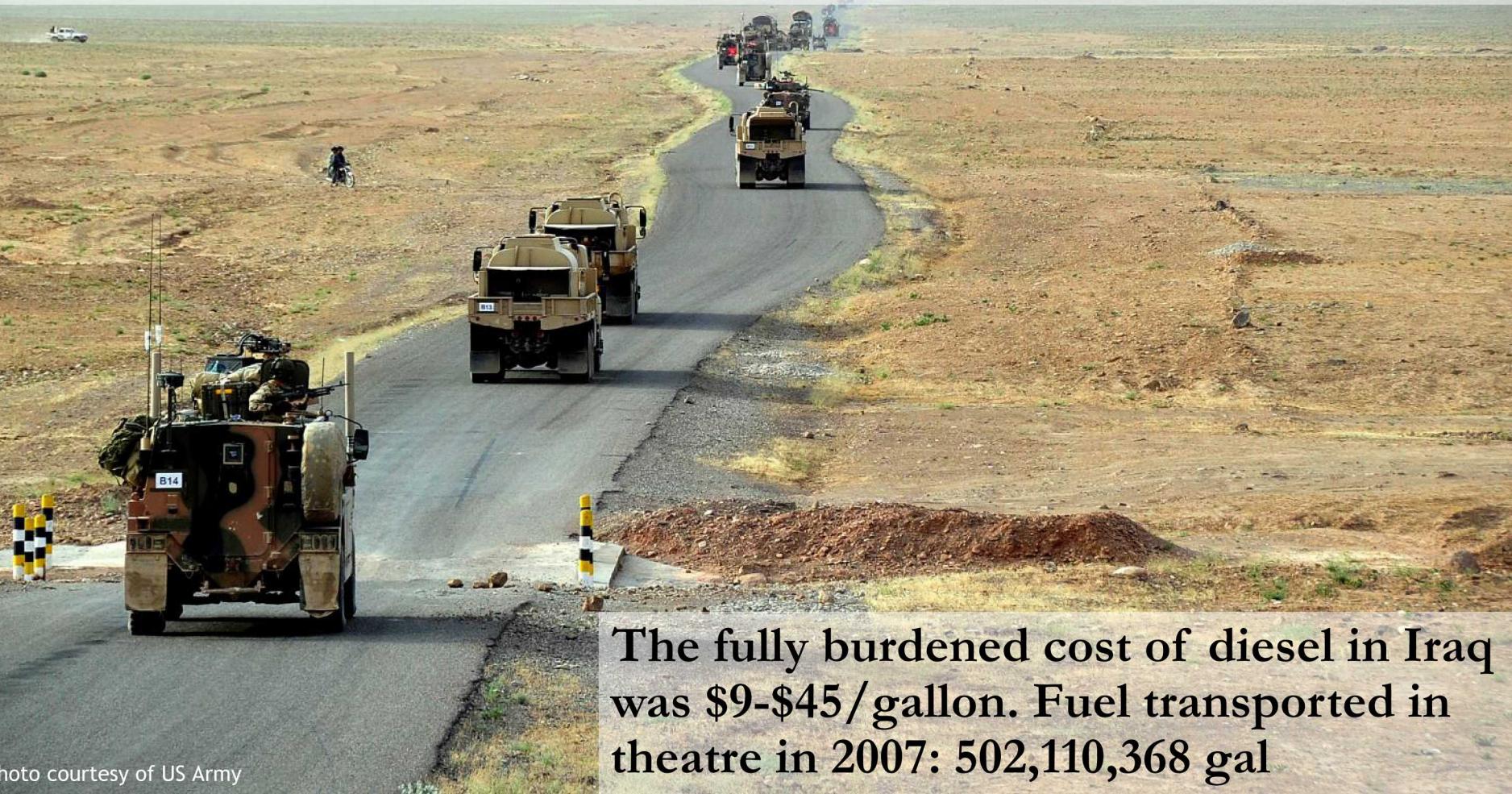
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# The Opportunity



In Afghanistan, attacks on fuel resupply missions represented a significant percentage of the injury and death rates among US troops, resulting in one casualty for every 24 resupply missions. 897 fuel convoys were required in 2007.



The fully burdened cost of diesel in Iraq was \$9-\$45/gallon. Fuel transported in theatre in 2007: 502,110,368 gal

# The Opportunity



**68.5 million forcibly displaced people worldwide**

**85% of those people are hosted in developing countries**

**Since 2008, an average of 26.4 million people per year have been displaced from their homes by disasters brought on by natural hazards.**

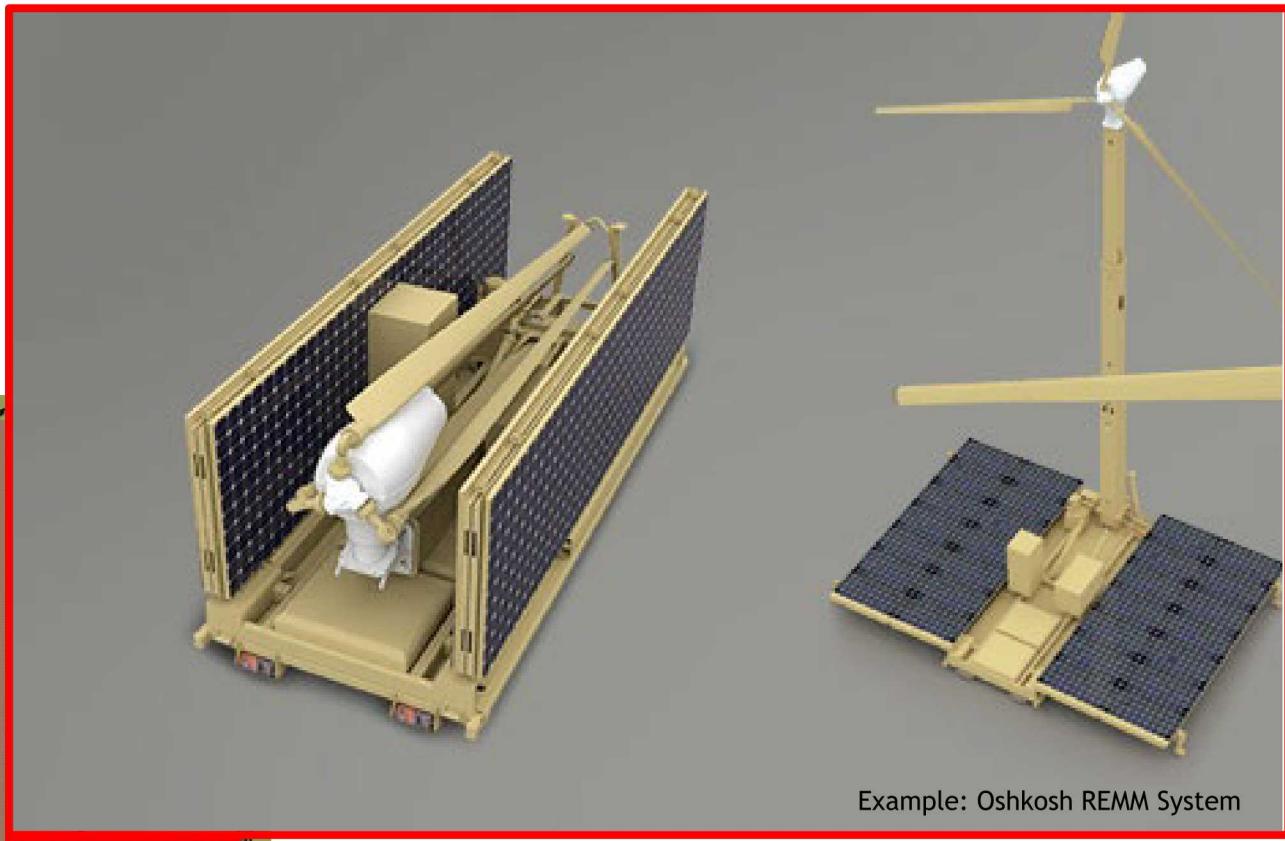
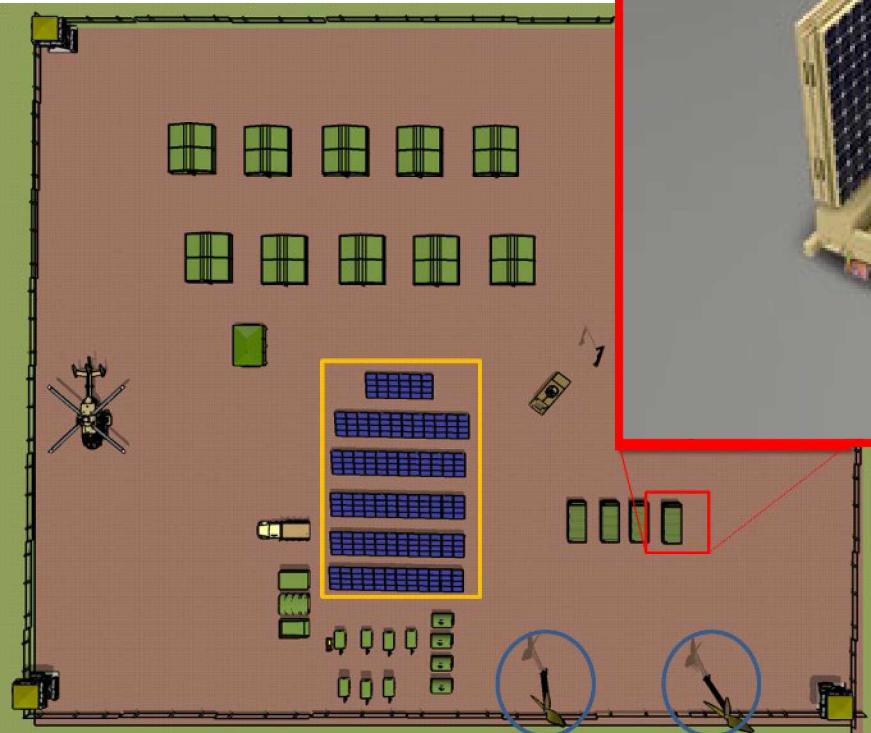


Kutupalong refugee camp in Bangladesh. Photo credit: UNHCR / Roger Arnold

# Approach



Define the design space for a deployable wind system designed for Forward Operating Bases for U.S. Military forces around the world.



Example: Oshkosh REMM System

Design for military application could be leveraged for disaster relief applications.

# Technology Gaps



## Commercial Systems

LCOE as primary objective

Single deployment for 20+ years



## Military & Disaster Response Applications

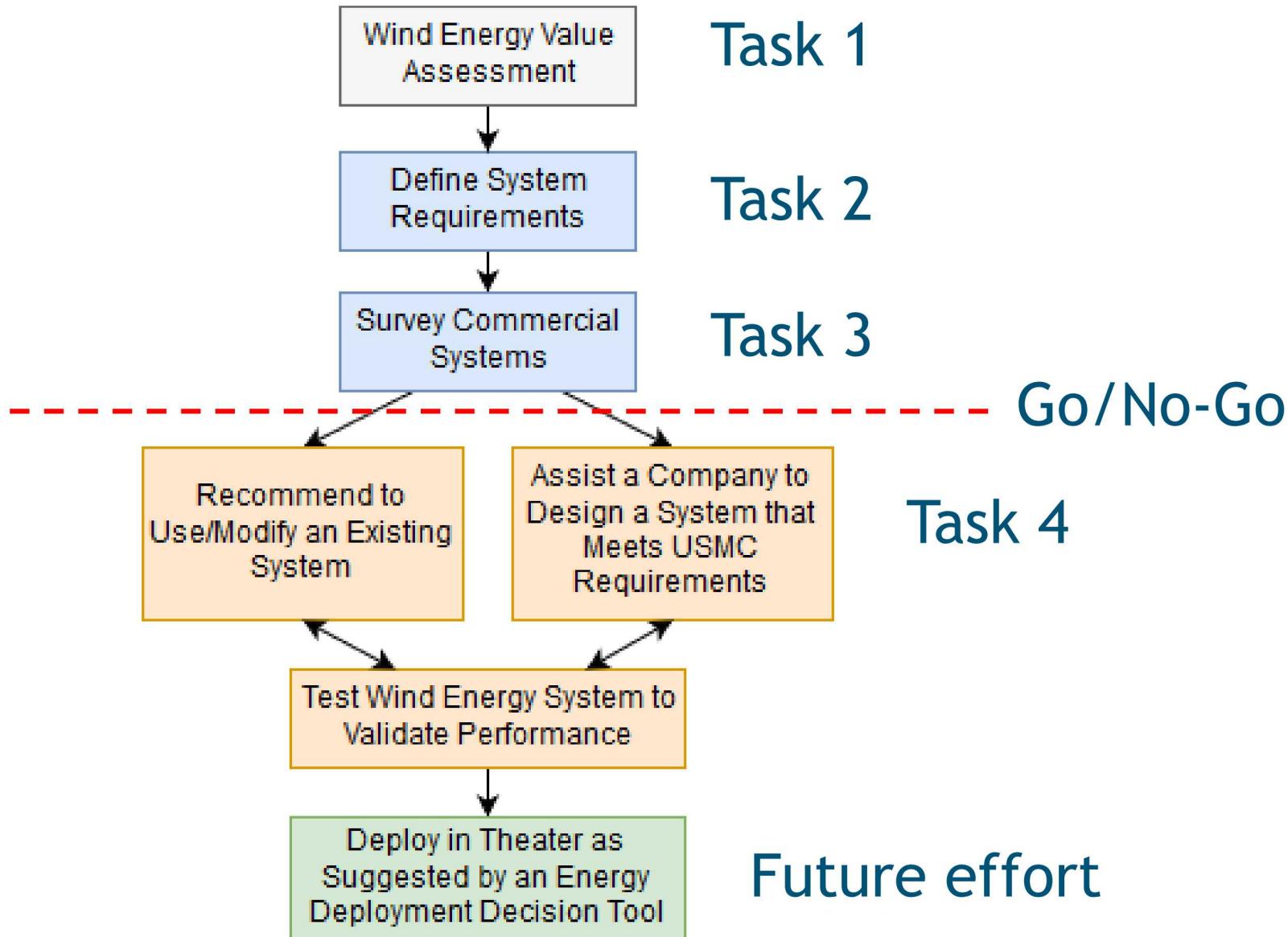
Deployable systems with logistics requirements

Compatible with base energy systems (microgrid)

Performance focused (cost not primary objective)



# Project Tasks



# Vision of Success



## Near-term:

Report quantifying the market opportunity for deployable wind systems

Identify the design space and technology gaps for optimized deployable wind systems.

## Longer term:

Facilitate opportunities between DOD & industry to effectively develop technology solutions

## Ultimate Vision:

US distributed wind energy industry is providing technology solutions for our deployed forces to meet their missions, safely and effectively

# Project Team



## National Laboratory R&D Partners

**Brian Naughton**, Sandia National Laboratories – Project lead, system modeling and design, data integration, reporting.

**Jake Gentle**, Idaho National Laboratory – DOD engagement, technology evaluation

**Robert Preus**, National Renewable Energy Laboratory – Industry engagement, technology evaluation

## Stakeholders

Military offices involved with planning, testing, and procuring energy systems for bases.

Distributed wind industry members with concepts and existing systems that could be adapted to military and disaster relief applications.

# Get Involved



We are actively reaching out to industry stakeholders to gather important information to make this project of value to you.

Please help us by reaching out to us as well.

[bnaught@sandia.gov](mailto:bnaught@sandia.gov)

505-844-4033