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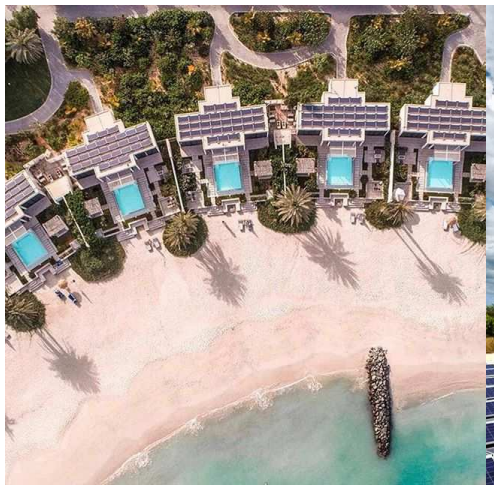
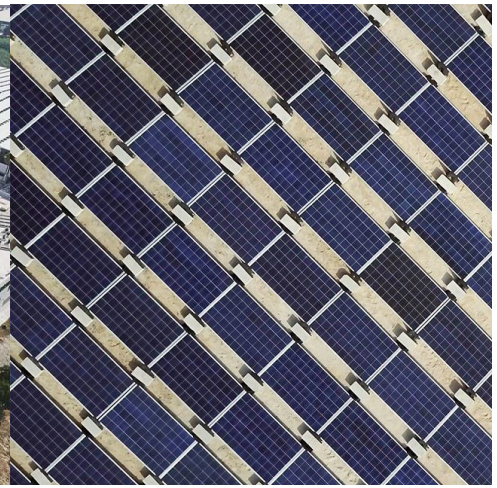
Airborne Wind Energy
The Customer Viewpoint

September 2020





Enerwhere is a distributed solar utility with 50+ successful micro-grid projects across the Middle East & Africa

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- World's first distributed solar utility – we sell electricity, cooling & energy efficiency as a service, primarily to commercial-/industrial customers without a grid connection
- Founded in 2012, ~100+ employees in offices in the UAE & Nigeria
- 30+ operating micro-grids with 30+ MW in operation across the Middle East & Africa
- Unique business model & modular, transportable technology allows operation on short-term contracts (3-5 years) in construction, mining, hospitality, oil & gas, etc.
- Highly interested in modular, mobile wind solution to increase share of renewable energy and reduce diesel fuel consumption & emissions

Requirements for airborne wind in micro-grid markets / Thoughts on early markets

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- Load range: typically 100 kW up to 20 MW => 80+% of opportunities can likely be covered with kites in the 100-500 kW range
- Storage / micro-grid BOS: complex & mostly already in place => no point in AWE OEMs developing this separately
- Nights & bad weather is when solar doesn't work => that's when wind is the most valuable
- Key markets are in the Middle East, Africa, South Asia and Islands (Caribbean, Indian Ocean, Pacific) => many low-wind locations, might require different optimization than large grid-connected projects
- Most micro-grids have a site operator => fully autonomous operation might not be required initially (as long as operation is simple and can be carried out by 1-2 local operators)
- Development finance could be a key enabler of early deployments => requires education of (engineering / financial) consultants & wider development aid community to get over trust hurdle

Thank you!

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For comments / questions please contact:

- **Daniel Zywietz**
  Founder & CEO
- daniel@enerwhere.com

Current hybrid micro-grids mostly combine low-cost solar PV with conventional diesel generators (plus some storage)

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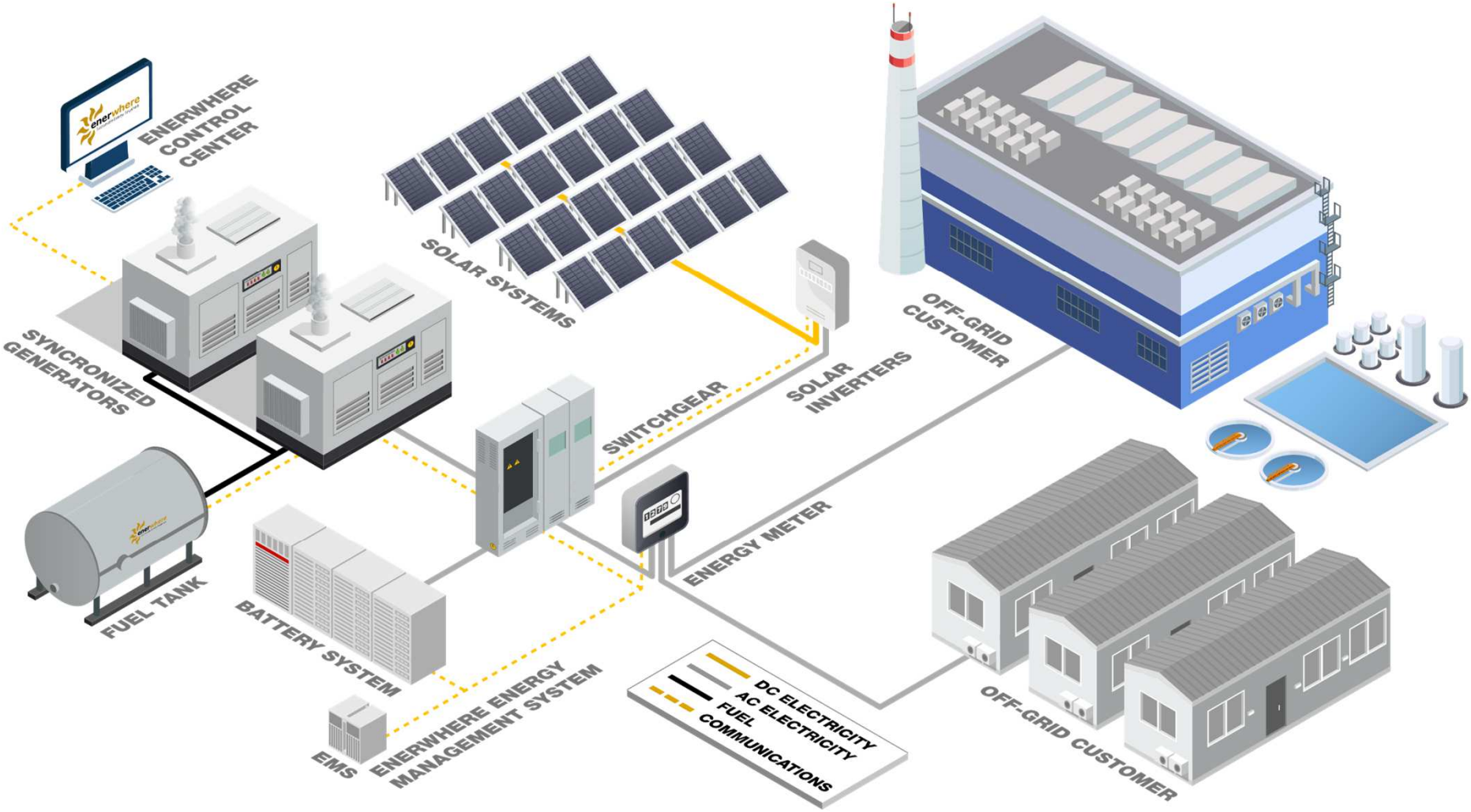
Overview of typical Enerwhere solar-diesel hybrid system



For a typical application, solar can save 30-50% of annual fuel consumption – higher shares requires storage or wind

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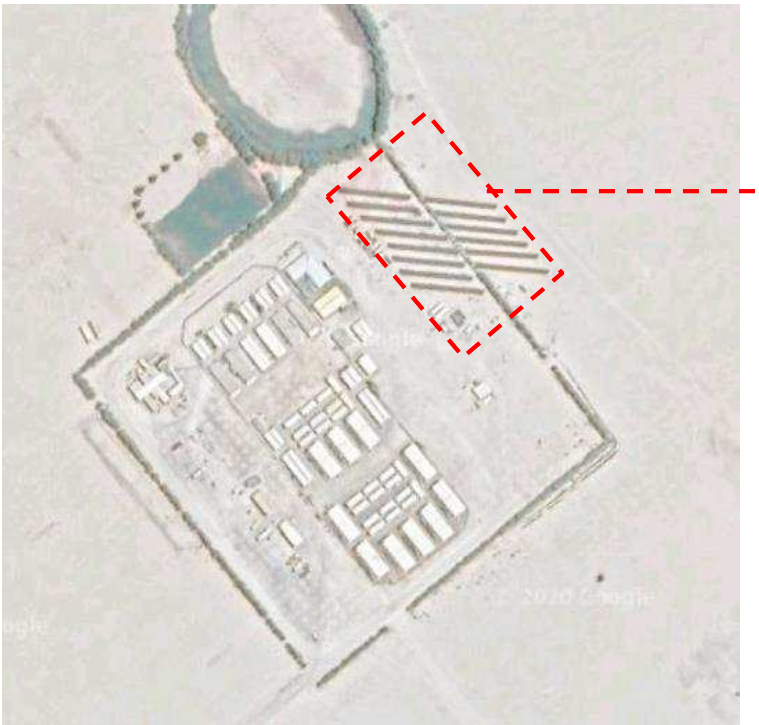
Case Study: SSV camp, Sir Bani Yas island, Abu Dhabi

- 600 occupants
- Kitchen, Laundry, STP
- Operating 24/7/365



Solar-diesel hybrid plant:

- 350 kWp solar
- 2 MVA diesel generators (incl. backup)
- Enerwhere hybrid manager

Solar is cheap & easy, so micro-grid developers will use as much as they can until they hit the load or space limit

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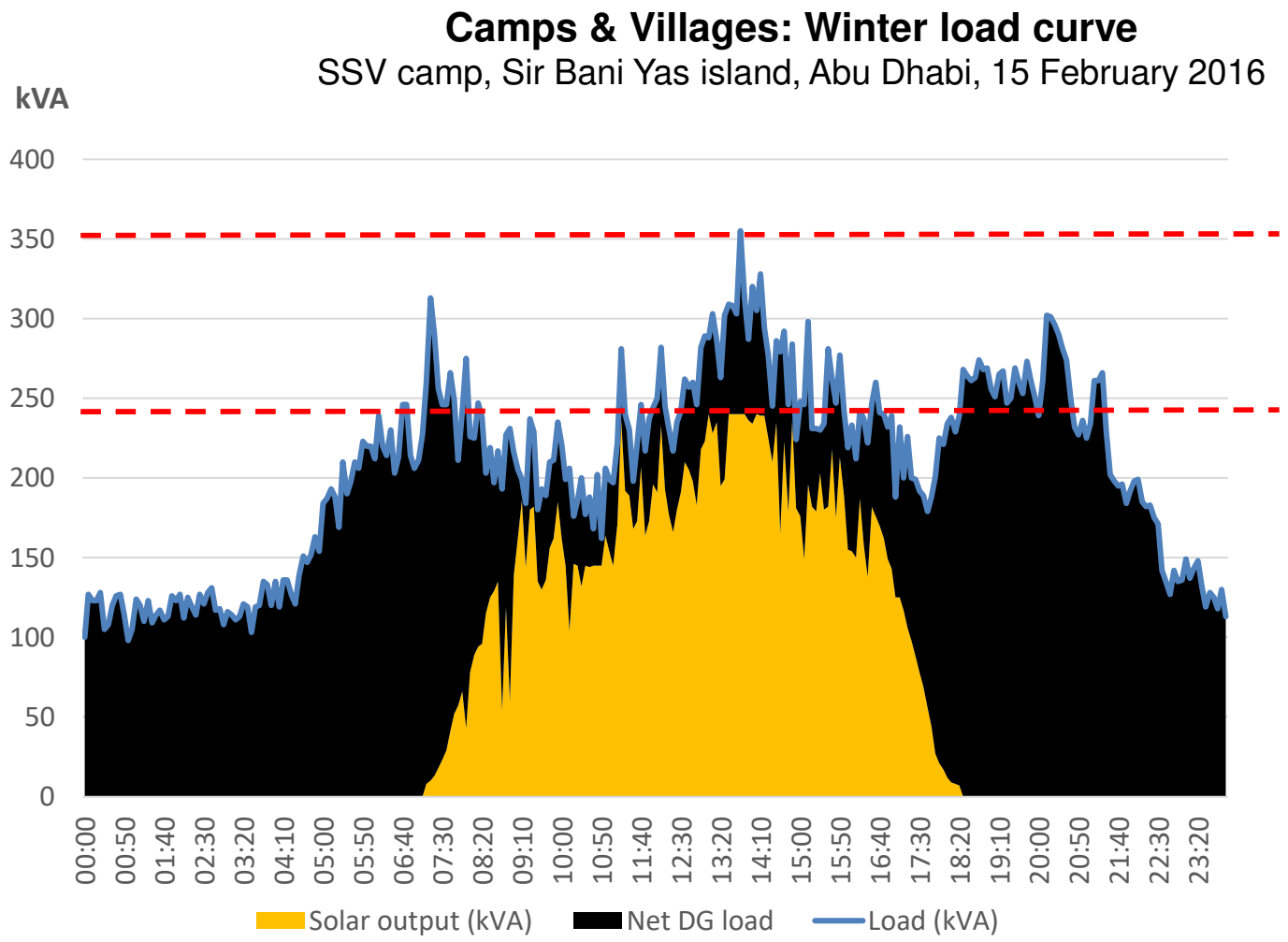

80-90% solar share is possible at noon

Daytime loads can be easily covered by solar but maximum annual share is 30-50% (without significant storage)