



# has developed a modular approach to mini-grids

Compared to other solar-diesel hybrids...

## Traditional

- Thousands of components
- Bespoke design
- Complex procurement, logistics and planning
- Often complex ground preparation required
- High on-site labour requirement
- Complex on-site works
- No ability for re-deployment

## SunSHIFT™

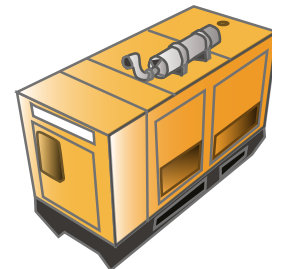
- ✓ Only a handful of module types
- ✓ Quick selection of off-the-shelf modules
- ✓ Off-site storage provides single source of modules ready for containerised transport to site
- ✓ Minimal ground preparation and remediation
- ✓ Low on-site labour requirement
- ✓ Safe modular on-site assembly
- ✓ Fully re-deployable

## Only 5 module types

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### Diesel generator(s)

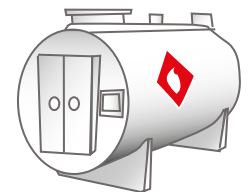
- Provided by the client or by SunSHIFT
- New or existing



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### Diesel fuel tank(s)

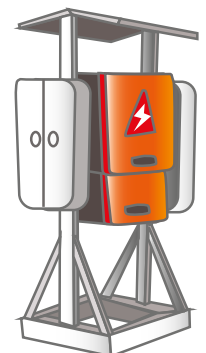
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### Integrator

- Integrates the solar and any optional energy storage with the diesel generator(s)
- Ruggedised for transport, Cyclone Region D capable, weather-protected and may be either pad-mounted or secured to the ground with a screw-pile<sup>1</sup>
- Houses the switchboard and the control system upon a galvanised steel frame
- The control system monitors the loading of the generator(s) and reduces the solar farm's output when necessary to ensure i) that the diesel generator(s) are never below minimum loading and ii) that the diesel generator(s) have sufficient spare capacity in a cloud event

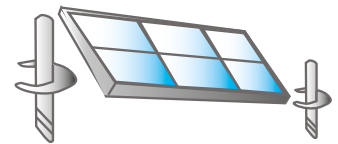


- The control system may control the diesel generator(s) if desired. Such control has the advantage of realising further diesel fuel savings through i) optimisation of the diesel fleet and ii) reducing any solar curtailment by informing the generators about the spinning reserve requirement.
- Optional on-site touchscreen as Human Machine Interface (HMI)
- Solar exported to the mini-grid is metered

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### Solar Array(s)

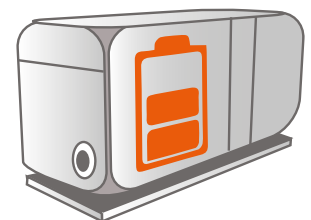
- Each 50kW SunSHIFT array consists of 24 identical solar modules, 1 inverter module and 25 + N screw-piles<sup>1</sup> where N is the number of rows (the modules may be configured in 1 row, 2 rows or 3 rows)
- Each solar module includes six highly-robust, highly-efficient (20.4%) monocrystalline silicon solar panels manufactured by the US panel manufacturer SunPower
- The solar module has maximum tilt angles 40°, 30°, 20° and 15° for the Cyclone Regions A, B, C and D respectively
- Ruggedised and compact for transport with 12 solar modules fitting into a standard 20ft flat-rack container, which may be easily unloaded on-site using a side-loader
- Plug-and-play fly-leads quickly connect the solar modules to form the necessary reticulation back to the inverter module
- The inverter module is ruggedised for transport, Cyclone Region D capable, weather-protected and may be either pad-mounted or secured to the ground with a screw-pile<sup>1</sup>
- All modules may be craned or forklifted, with stacks of three solar modules per lift
- Array, inclusive of row spacing, has electrical power density of 83W/sqm
- Requires zero to minimum ground preparation and is suitable in undulating terrain. Site remediation is also minimal when removing/relocating the arrays
- Once the modules are placed upon the screw-piles and the fly-leads connected there is no further on-site construction activity to be done



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### Energy Store(s)

- Optional lithium-ion battery and inverter container(s) for achieving higher solar penetration and greater diesel fuel savings
- Designed for fast injection and absorption of power



<sup>1</sup>Screw-piles are the preferred ground-restraint. However, under certain soil conditions, alternatives such as rock-anchors may be employed.

