



# Hybrid Solar Farm Technology Overview

Toddington Harper, CEO GRIDSERVE®



# GRIDSERVE® Overview

## GRIDSERVE deliver cutting edge sustainable energy solutions for critical power infrastructure

- We are experienced sustainable energy professionals with roots that started with some of the world's first commercial deployments of solar energy and energy storage solutions over 40-years ago
- GRIDSERVE are at the forefront of delivering solutions to profitably transition our energy infrastructure away from fossil fuels and reach net zero carbon emissions as quickly as possible
- We combine the latest advances in solar energy + energy storage + sophisticated controls and operating methods to deliver dependable, clean, low cost energy for the most demanding critical power applications, including:

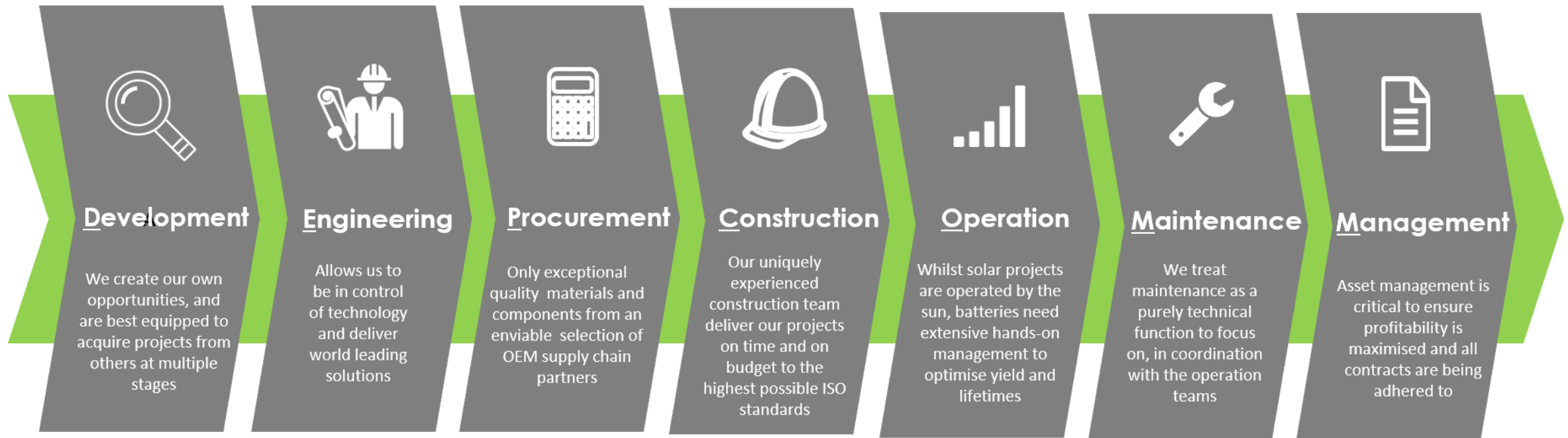
**GRID POWER:** The 2019 UK market and technology leader for utility-scale hybrid solar farms

**EV POWER:** Our new charging network of Electric Forecourts® will revolutionise charging electric vehicles

**REMOTE POWER:** Our SolarEnergyCentre® solutions remove reliance on diesel and enable clean, dependable power anywhere

- We are a 50-person, growing, profitable company
- In 2020 we entered into a strategic partnership with Hitachi Capital

# GRIDSERVE: A fully integrated sustainable energy business



# GRID POWER

# GRID POWER

Our hybrid solar farms are the most technically advanced ever to be constructed in the UK and enable the grid to be majority-supplied by intermittent renewable energy sources – this is fundamental to achieving a net zero carbon electrical energy infrastructure

**Bifacial Solar Panels**

+

**Horizontal Axis Trackers**

+

**Batteries**

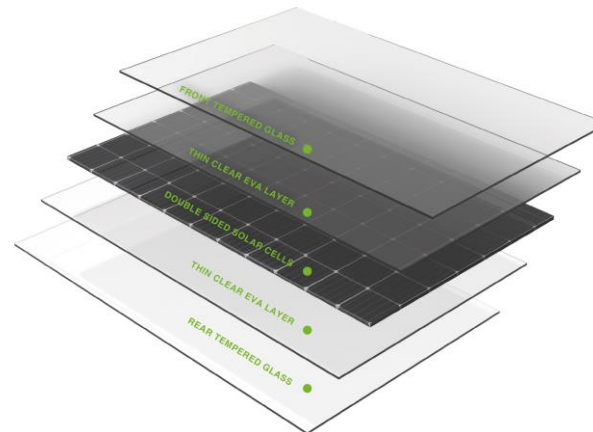


In 2019 GRIDSERVE were the UK technology and market leader, installing more solar power than any other company in the UK in that year, whilst also delivering multiple 'UK-first' technical innovations to maximise yield, income, flexibility, dependability

# TECHNOLOGY: BIFACIAL SOLAR MODULES

## Generating energy from both sides of the panel

Another UK first delivered by GRIDSERVE is the utilisation of bifacial solar modules that harvest energy from both the front and the underside of the panel. The back of the cells benefit from light bounce (known as Albedo) to further maximise the energy production and optimise energy yield for that given area without proportionally increasing costs

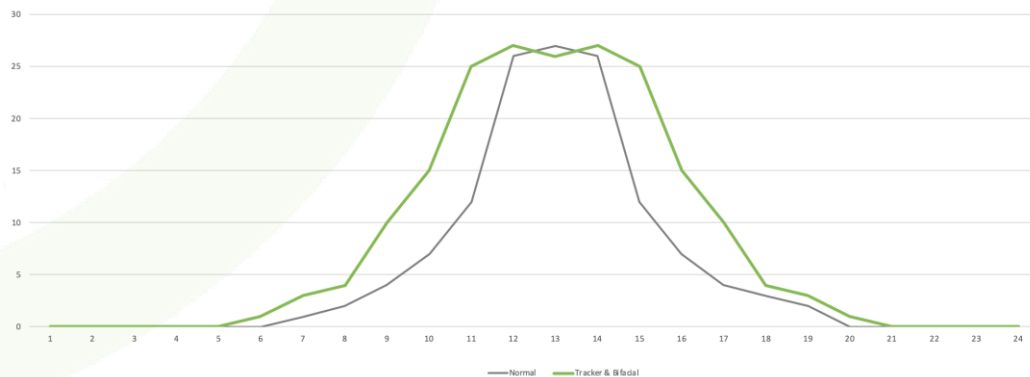


# TECHNOLOGY: SOLAR TRACKING

Tracking the sun from dawn until dusk to stabilise power production and optimise yield.

GRIDSERVE focus on maximising both energy yields and the value of the energy produced...

Solar trackers allow the panels to follow the sun on its journey from east to west each day. Whilst a fixed position panel will collect a majority proportion of energy around midday – significant power is also available in the early mornings and late afternoons, and this can be harnessed by solar trackers



# TECHNOLOGY: ENERGY STORAGE

GRIDSERVE's battery storage solutions are at the front line of modern grid infrastructure needs. As well as using batteries to shift solar energy to more valuable periods, batteries provide services that help the National Grid to balance supply and demand and support growth of renewables and electric vehicles



## Frequency Response

- Enhanced Frequency Response (EFR)
- Firm Frequency Response (dynamic)
- Firm Frequency Response (static)
- Firm Frequency Response (bridging)
- Frequency Control by Demand Management
- Fast Start
- BM Startup / BM Actions
- Trades



## Reserve Products

- Fast Reserve
- Demand Turn-Up
- Short Term Operating Reserve
- Short Term Operating Runway
- Super SEL
- Fast Start
- BM Startup
- BM Actions
- Trades



## Voltage Control

- Mandatory Reactive Power
- Enhance Reactive Power
- Constraint Management (Voltage)



## System Security

- Black Start
- Max Gen
- Intertips
- Trip to House Load
- Constraint Management



# OVERVIEW OF YORK HYBRID SOLAR FARM

91,392 Half Cut P Type  
PERC Bifacial solar modules  
34.7MWp total

Multiple areas  
reserved for nature  
sanctuaries

Over 1000  
horizontal access  
trackers

11 Containers housing  
30MWh of Lithium Energy  
Storage

11 Containers  
housing inverters  
& RMS

500+ kilometers of  
wiring

This 34.7MWp bifacial solar + single axis tracker + 30MWh battery project provides multiple services to support the grid whilst simultaneously producing enough energy for over 20,000 electric vehicles / 13,000 households every year for at least the next 30 years

— Please view the Constructing York Hybrid Solar Farm YouTube Video



# **ELECTRIC VEHICLE POWER**

# GRIDSERVE Electric Forecourt®

The ultimate electric vehicle charging experience, powered by low cost clean energy that supports the grid



Overview of **Braintree Electric Forecourt®** - in construction & scheduled to be operational by June 2020

# Contact Details



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