VAASCO Group

# Grid voltage control deploy to enhance Solar PV assets

A managed service model for commercial and industrial customers

22 July 2024

For distribution to customers

# Opportunity
# reduce power bills and CO2 emissions

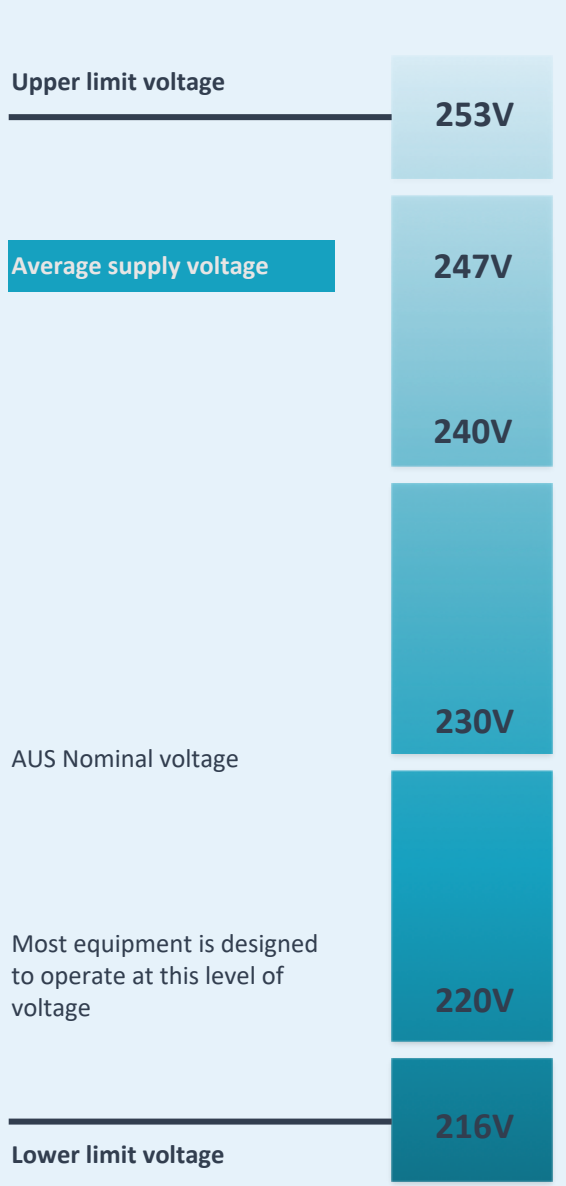
## Grid average of 247 V vs 220 V

Supply voltage is materially higher (247 V on average) than required (> 220 V).

**This results in:**

- higher electricity usage, and bills
- higher CO2 emissions
- heightened risk of equipment failure






Increased prevalence of supply voltages exceeding the maximum

Curtailment of PV generation (Inverter "backoff") c. 251V

Your business could be paying for this level of voltage

**Voltage Power Optimisation (VPO) will reduce** your incoming voltage leading to lower electricity usage and reduced bills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## VOLTAGE OPTIMISATION reduces the energy usage caused by elevated grid voltages, leading to....

- Reduced energy bill, reduced CO2 footprint range (typically 10 - 17%)
- Cash flow uplift range (net bill reduction shared with VAASCO)
- NIL capital investment requirement (due to the Managed Service Model)
- Off Balance Sheet for the energy user

## VOLTAGE OPTIMISATION will enhance the generation availability and output of site PV Solar installations

+ IOT cloud based monitoring for asset management and performance reporting

+ Monthly billing by direct debit



# VAAS complements renewable energy solutions

## Co-deployment of VAAS with distributed Solar PV generation

Solar PV is an energy source that may be deployed at a customer facility. It reduces the energy [kWh] imported from the grid to the site load, during daylight hours. It may even export to the grid if generation exceeds site loads. Solar PV installation will typically be limited by available roof area, limiting its generation capacity.

The increasing installed base of distributed Solar PV increases the variability of grid voltages, and the following effects may occur at a customer site:

- Reduced generation availability, dur to inverter back-off and zero generation when near statutory maximum voltage
- Increased load energy consumption, causing increased grid imports

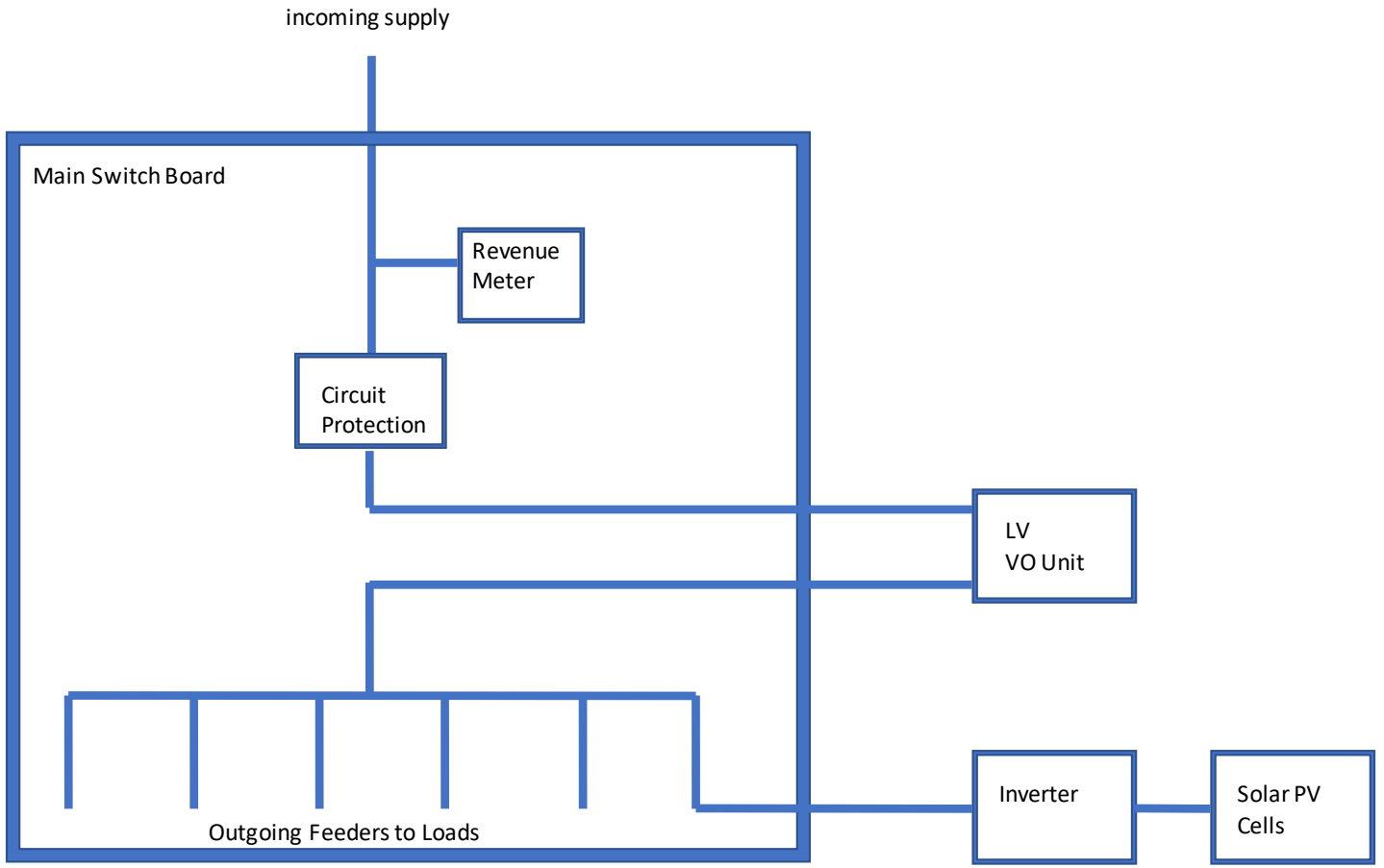
Installing VAAS reduces energy consumed within the site, and enhances Solar PV operation:

- Site voltage is brought to an optimum level (at or about 220V).
- Energy consumption [kWh] of the site load will be reduced at all times, further reducing energy imported from the grid.
- Equipment on the site will not be exposed to high voltages, thus improving the lifespan of the equipment
- Solar PV inverters will not trip on high voltages and perform to the inverter design and specifications.
- Solar PV output will be improved as inverters will operate at maximum output and run cooler due to over voltage removal.

**Installing VO improves the Solar PV payback years and ROI.**

# LV VO configuration

## LV VO and Solar PV typical connections

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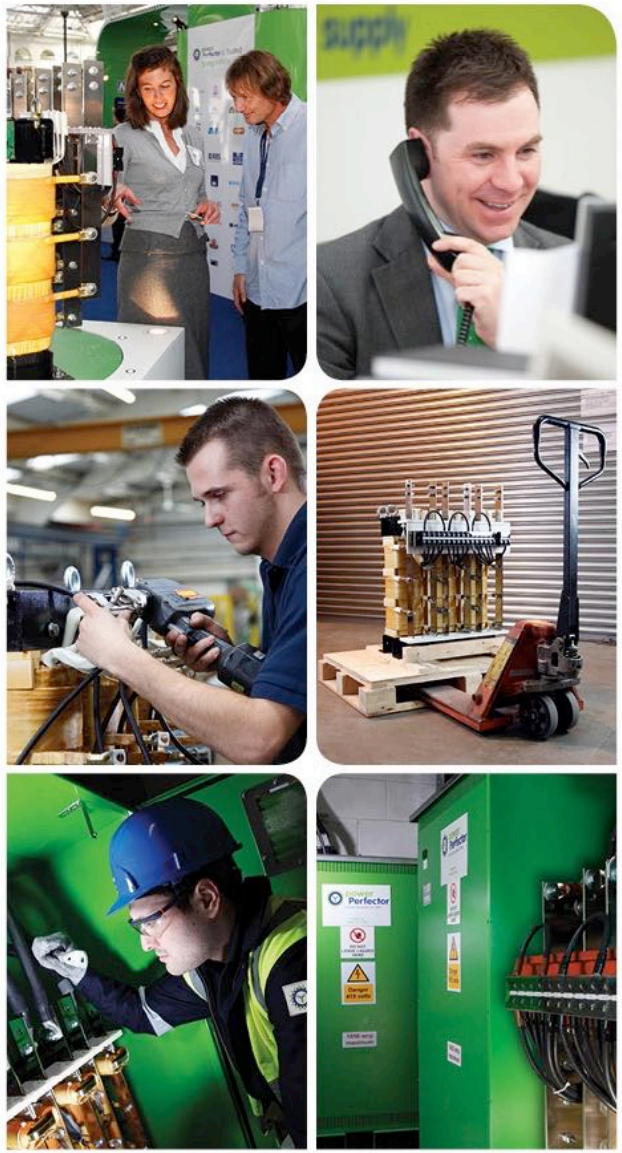

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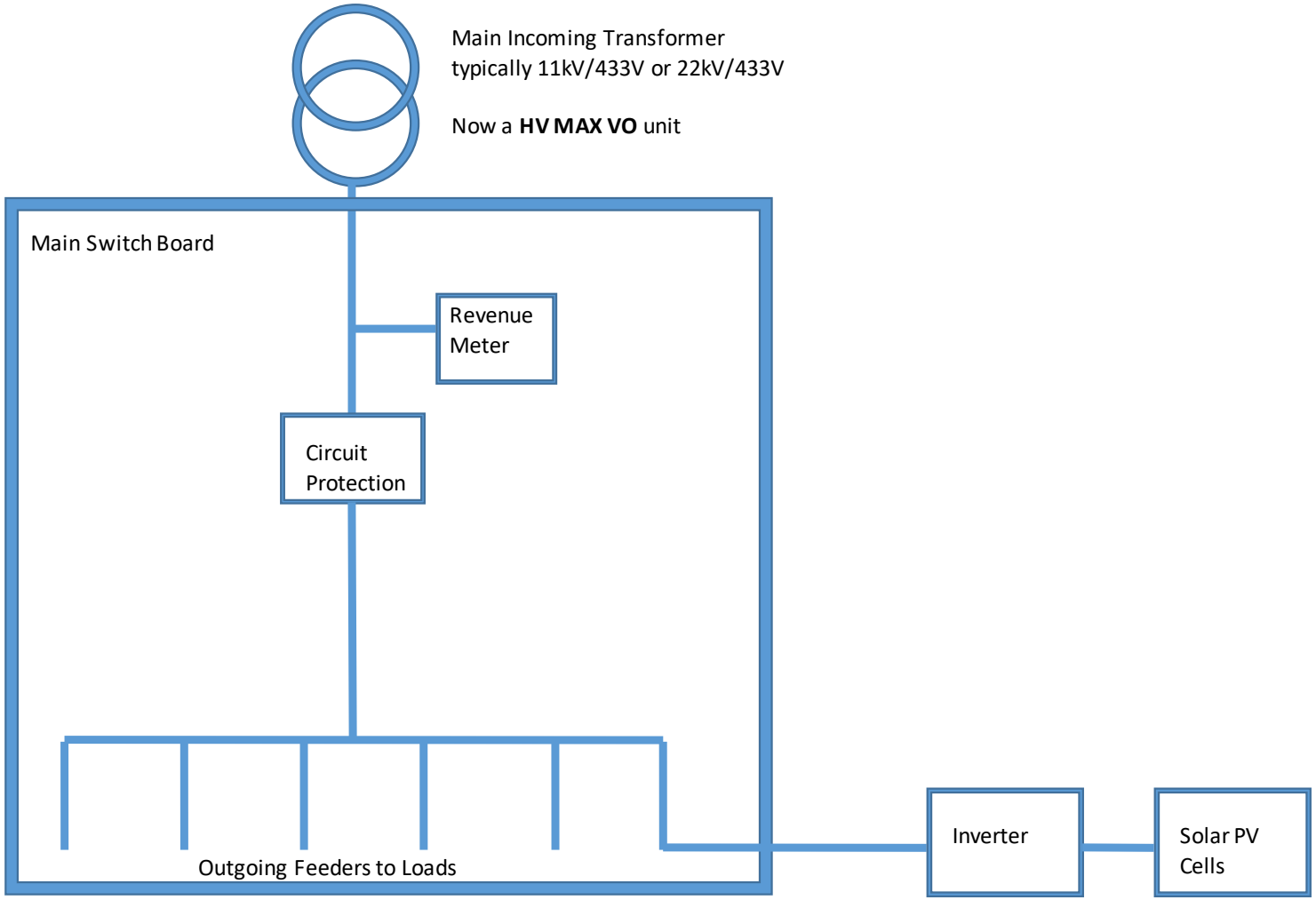
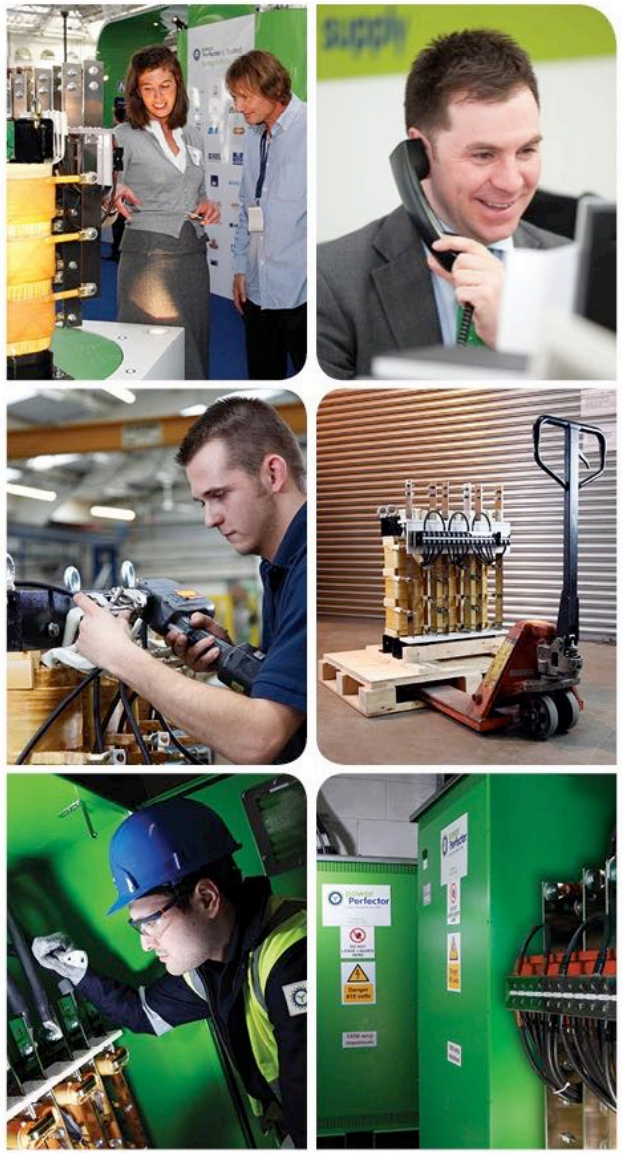
# LV VO configuration

## HV VO and Solar PV typical connections



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# Case study : VO & Solar PV

## SME C&I customer scenario

- Customer has onsite Solar PV generation

## Before VO

- Solar providing 50% of site energy [kWh]
- Grid supply providing 50% of site energy [kWh]

## After VO installation

- **VO saving is 12.5% of total site load energy consumption** [kWh]
- **Outcome** Grid energy imports reduced by 25.0% [kWh]

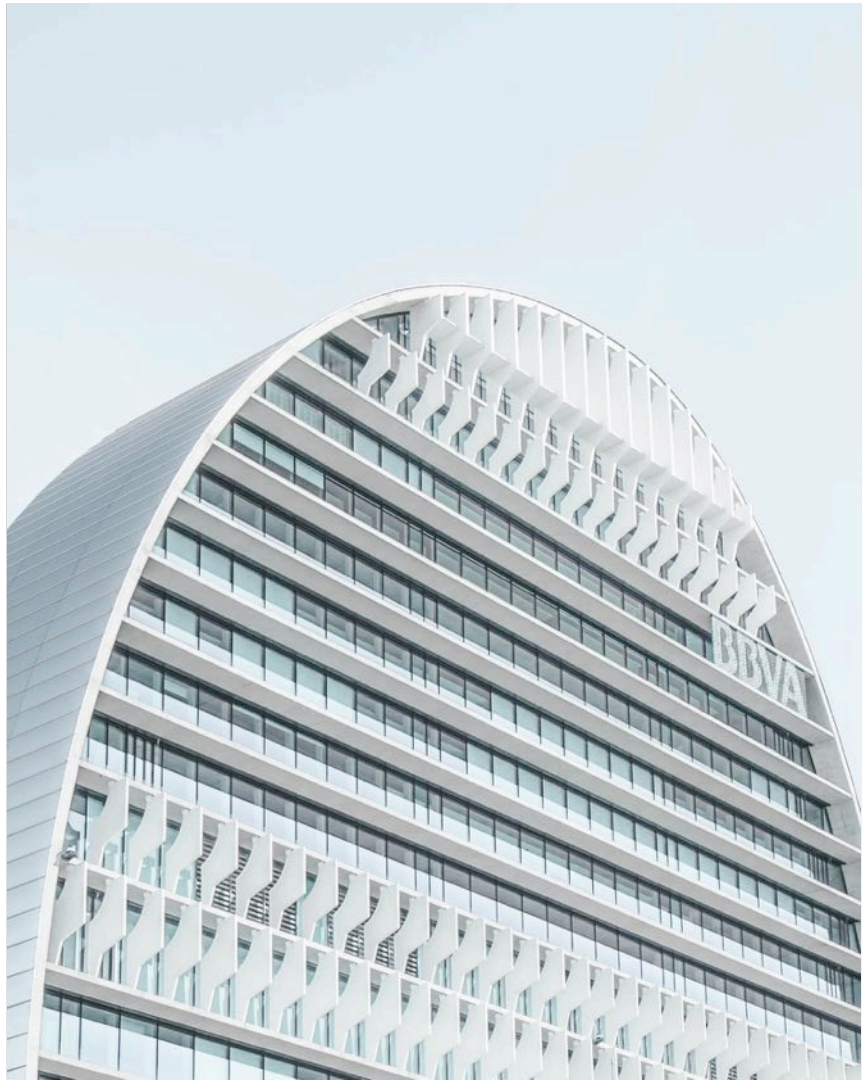
## Conclusion

- **Utility energy supply bill reduced by 25.0%**
- Carbon footprint reduced by 25.0%
  A significant step towards **NET ZERO ENERGY**

## VAASCO splits the saving with the customer *

* Depending upon factors such as asset utilization, grid voltage profile, equipment inventory, the nominal 50/50 may be adjusted by VAASCO to another split to ensure the financial viability of the project for VAASCO and other stakeholders.

# Next steps
## data requests




For VO to be installed with Solar PV, the following is required:

- Site survey to understand the type of load on the site.
- Voltage logging to get the voltage profile over a minimum of 7 days.
- Energy consumption [kWh] data with tariff details.
- Site specific installation assessment.

Please discuss with our representative for the next steps for VO proposal and installation.

# Screening information

## VAASCO Group's portfolio approach enhances Solar PV asset portfolios

**Purpose** Simple value screen to assess customer value, for use with portfolios of Solar PV installations

**Asset Manager** List portfolio (rank by energy usage)

For each Solar PV asset, list the following basic parameters

| | |
|---|---|
| Grid import | Total energy import (MWh pa, $ pa) |
| Solar PV | Installed capacity (kW) |
| Solar Gen | Total energy generated (MWh pa, $ pa) |
| [*Load usage* | *Total energy usage (MWh pa) = Grid import + Solar Gen*] |

For each end-user customer, list the following basic parameters

| | |
|---|---|
| Scale | Number of sites in sub-portfolio |
| Intensity | Average Energy import per site (MWh pa, $ pa / # sites) |

# Contact

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SCAN ME