Anesco:
Utility Scale to Domestic Energy Storage

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10th Cleanpower Smart Grids 2019 Cambridge

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AMAZING ENERGY

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- Company overview
- Utility Scale Storage
- Domestic Storage
- How Domestic Storage can enable low carbon homes

The history of Anesco

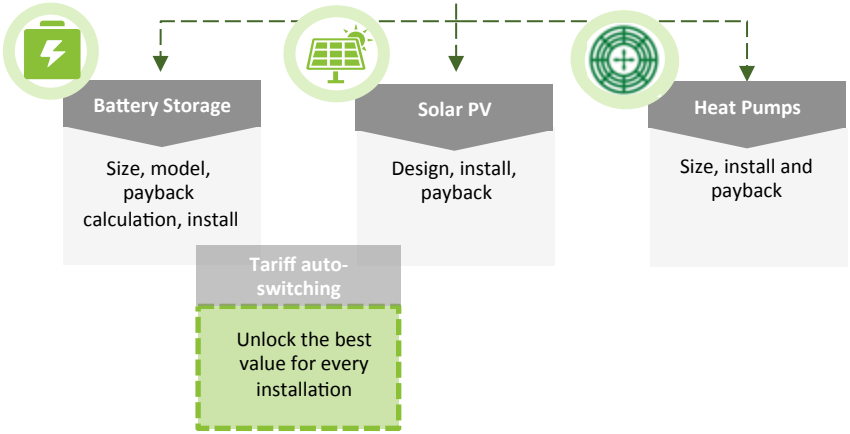
- Founded in 2010 by former directors of Scottish and Southern Energy plc (SSE), one of the UK's biggest energy companies
- Top 100 Clean Tech companies in the world
- 2014 Launched the UK's first commercial grid scale battery
- 2017 Launched the UK's first subsidy free solar farm

Anesco – a history of firsts

Solar	Hybrid	Battery
Designed and built the U free solar f		id-scale battery built in 2014
Full turn-key provider for solar		7 MW of operational sites
101 ground mount proje		V in development, with 40MW ed to come online in 6 months
45MW in devel		ed and built >40% of non EFR storage assets

As of last week our 20MW Lascar battery site has officially entered the BM with Limejump

Introduction



O&M – AnescoMeter
Provision of Operations and Maintenance, and Asset Management services for renewable assets in the UK

Asset Management
Maximising returns for investors through revenue optimisation and aggregator management

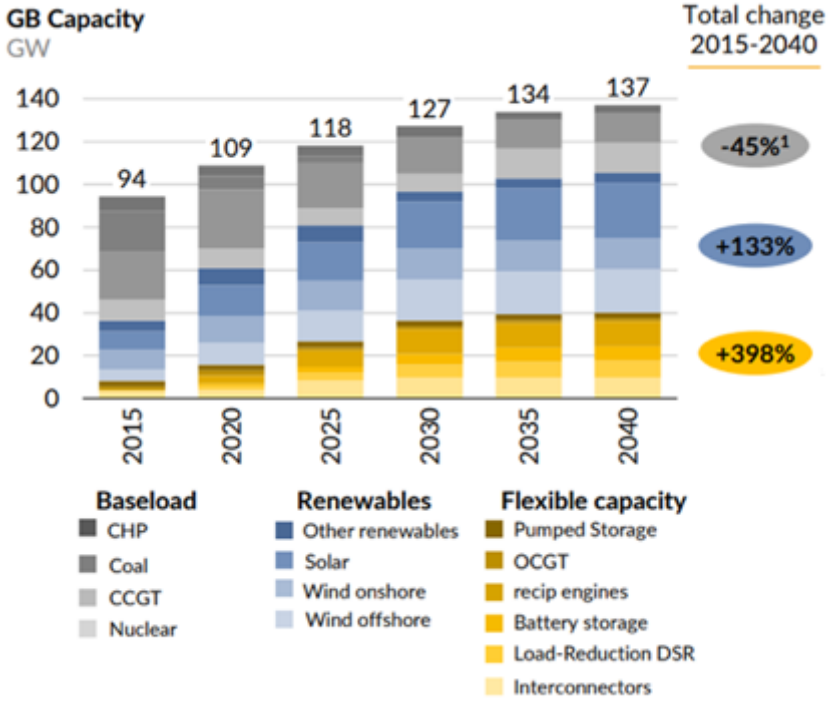
Consultancy
Using our in-house expertise to offer bespoke consultancy services

ECO
Anesco's ECO team act as a managing agent to ensure energy companies are compliant with legislation

Projects
Design build and install battery assets, rooftop and ground mount PV and BTM technologies.

The future of the network

- In 2018 47% of our electricity came from low carbon sources, the rest mainly from coal and gas
- Coal to be decommissioned by mid 2020's, gas will require tighter control on emissions and nuclear projects delayed
- Uptake of local renewable's and energy storage is predicted to be 65% of generation by 2050
- Electricity generation capacity could increase from 103GW today to up to 268GW by 2050
- There is a need to bring control and balance to the future network at every scale



Source: Aurora – GB Capacity Outlook

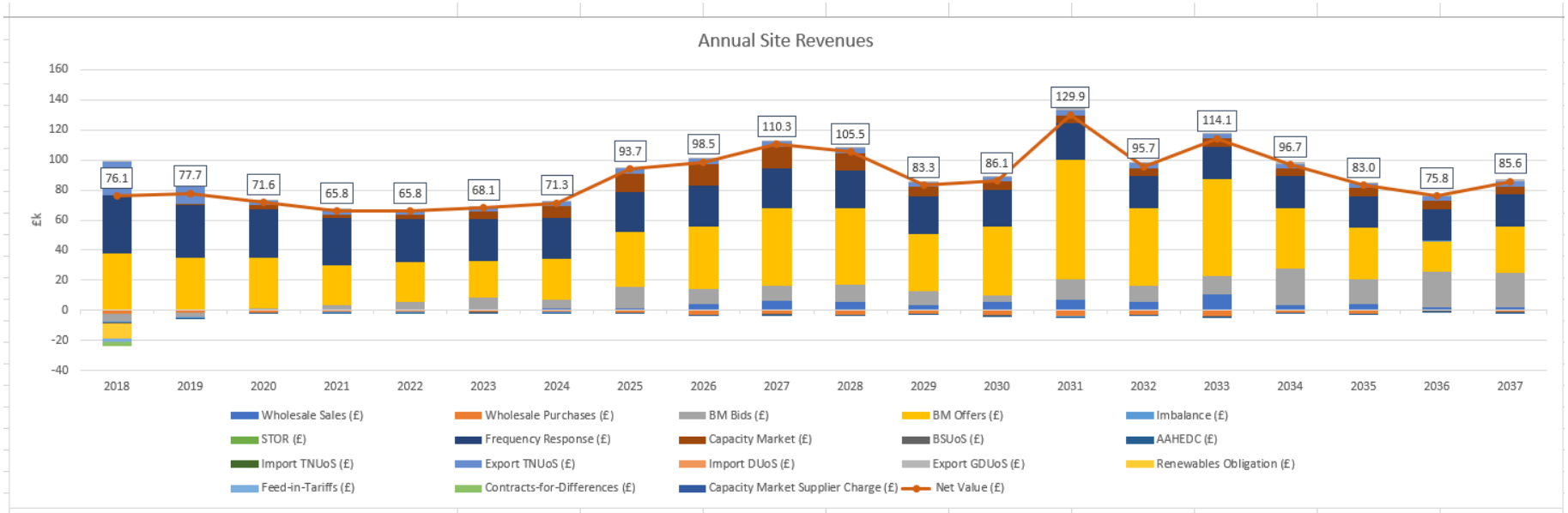
Anesco's revenue model

- Model has been built by Anesco and Cornwall Insight to forecast the revenue streams and optimise the investment.
- Using a Monte Carlo simulation, the model provides an annual site revenue stack for the lifetime of the project by optimising, day by day, buy and sell opportunities that across wholesale and BM markets whilst also stacking the secure contracted volumes e.g. FFR and CM
- Based on National Grids Future Energy Scenarios - Steady Progression:
  - Slower improvements in appliance efficiency and little electrification of heat.
  - Significant update of EVs, so smart technology is important for meeting peak demand
  - A greater emphasis on large scale, rather than local generation. There is development of nuclear power and offshore wind.

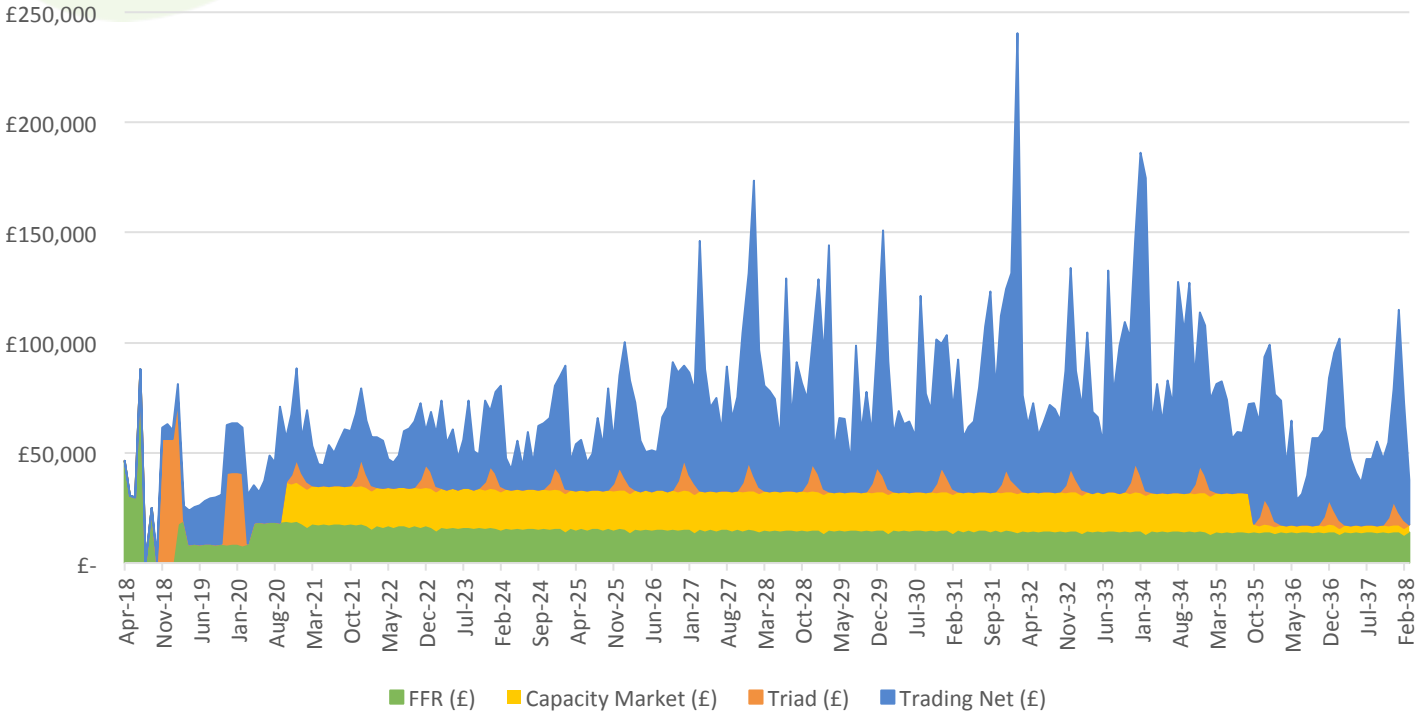
- Th er 70 other inputs into the control sheet ranging from connection voltage, location of the asset to the daily battery cycles limit in order to model site specific assets.

Example revenue stack

1MW project



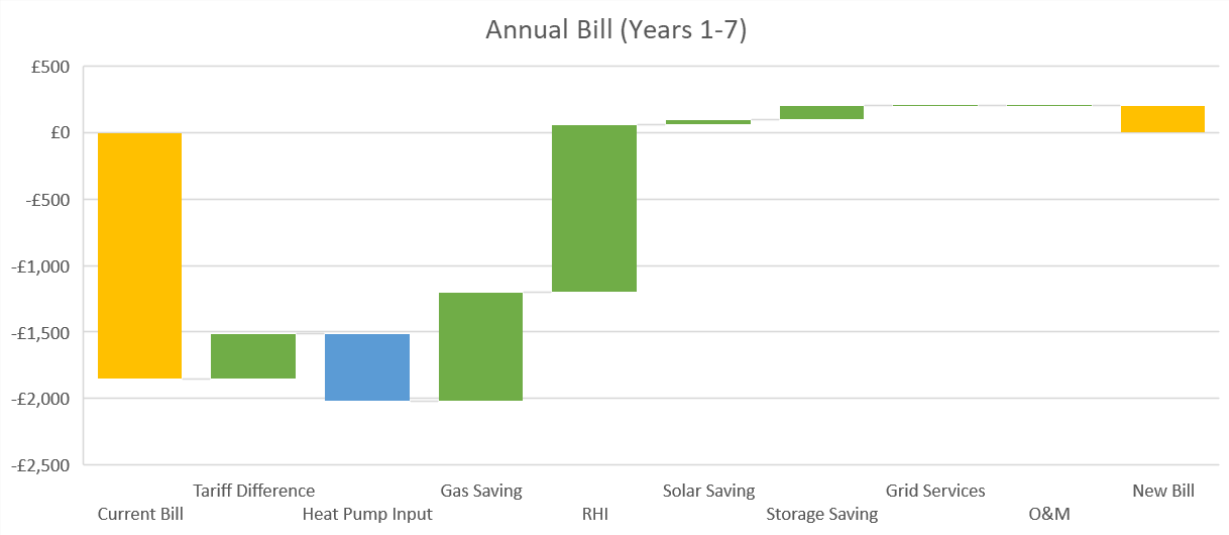
Stacked current revenue streams



“market access and agility is key”

Principles for Domestic are the same as for Utility Scale

- Understand the market in depth
- Model on a detailed basis
- Good value installation
- Ongoing Operation and Maintenance
- Sweat the asset



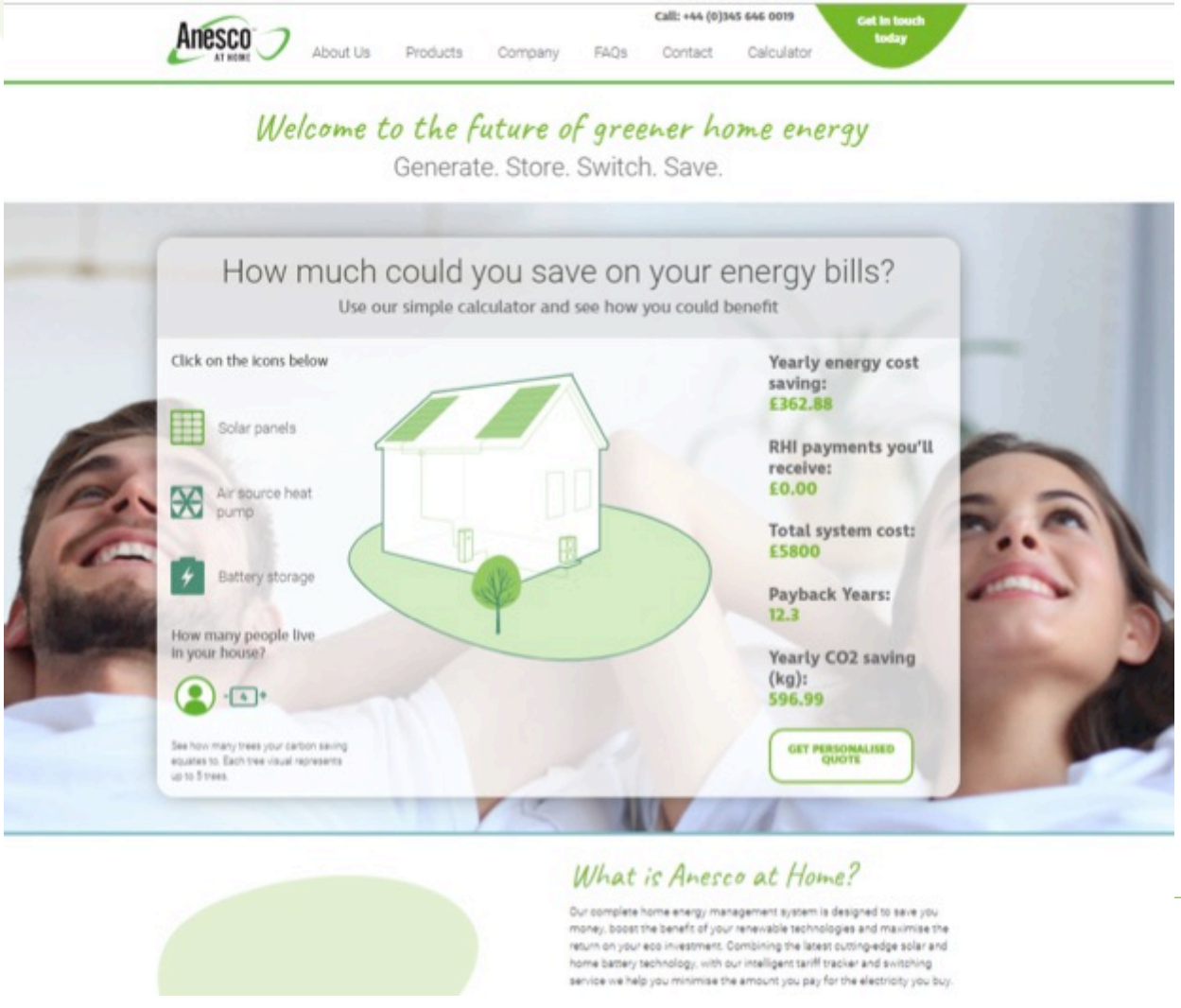
Where did we start from with Domestic Storage

- First priority was the commercial model – it had to pay for itself
- Market Research with 1,100 sample showed that domestic storage (and associated tech) is attractive and important for low carbon living

Energy storage for the home. Sized, installed, and intelligently managed for that induvial home.

Supplemented by solar panels, an EV charge point and/or a heat pump to maximise payback of the storage and minimise the carbon footprint of the home.

***Energy supplier independent - we actively switch to get the most out of the installation. This provides the best pay-back on the market and differentiates us from the main competition*.**



Anesco

https://anescohome.co.uk/

Payback example

My energy bills used to be:

- Gas £822
- Electricity £1,425

- Total £2,247

- My carbon footprint 5,386kg CO2
  - (inc. previous 1095kg CO2 saving from existing PV)

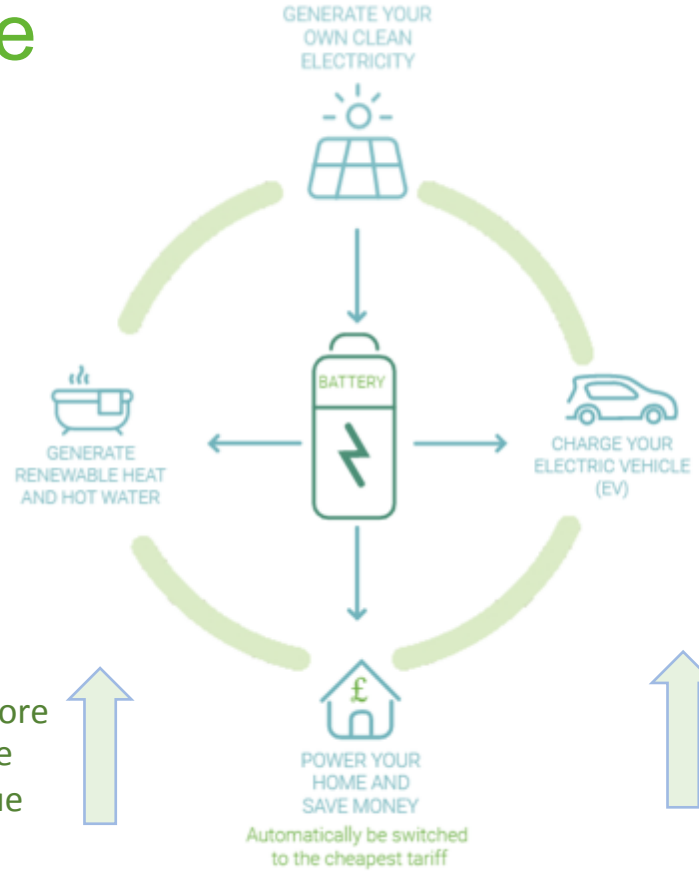
Now

- Electricity £1,055
- RHI - £1,257

- Total –£202 (net positive)

- My carbon footprint 2,400 kg CO2

A virtuous circle



1) More solar is used within the home increasing payback

2) Solar reduces running costs of EV and ASHP

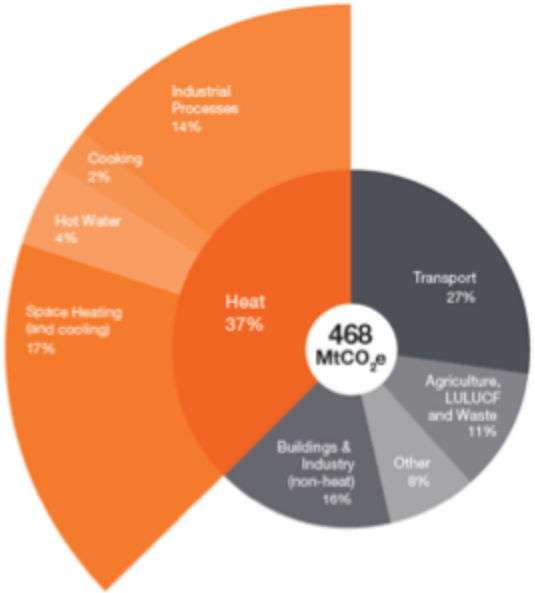
3) EV and ASHP means more power is processed by the battery increasing its value

4) Optimised energy tariff locks in the best return on the market for all technology and uses the full capacity of the battery year round

A word on heat

- Carbon emissions from domestic heat account for over 20% of UK emissions.
- Staggering air quality impact of gas boilers - In central London 33% of NOX emissions came from gas heating.
- Domestic heating in the home must be decarbonized to meet our 2050 targets. All scenarios that meet our climate targets have homes running on low temperature systems, i.e. heat pumps, heat networks, heat recovery etc.
- People are still fitting gas boilers
- 60.5m homes are D rated or below - they use **twice** the amount of energy to get their homes to a comfortable temperature, and **occupiers spend twice the amount of money** than those in ABC rated homes to keep them warm
- By neglecting to improve housing stock most of which is below D rating, and not building homes to the highest standards then between now and 2050 the UK will have unnecessarily wasted 2bn tonnes of CO2 heating those homes.
- To put that in context the current global emissions are 9bn tonnes a year.
- Decarbonising heat is something that we cannot afford not to do.

Estimated UK Emissions Attributable to Heating, 2016



BEIS – Decarbonising Heat

The 4 D’s of Future Energy

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A l : 3 Ds

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Thank you