



Greening the path to Net Zero: The value chain in energy management

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Realising the full potential of energy assets

Agenda: Greening the path to net zero

- Rethinking the energy hierarchy
- Energy management & efficiency
- Are renewables the only answer?
- Local energy trading as a new solution
- A merit order for deployment
- Potential revenues for participants
- Conclusions



Rethinking the Energy Hierarchy

Mean

Avoid waste, energy thrift

Lean

Energy efficiency, DSM

Green

Renewable energy

Clean

Residual – supply side choices







Be Mean: Avoiding Energy Use

Mean

Lean

Green

Clean



- > Energy Awareness; Champions
- **Energy Conscious Company (ESTA/EI)**

Monitoring & Targeting

> Half hourly metering

Formal Energy Management Systems

> ISO 50001; Energy Review (Audit) Cut down - ISO 50005/50009

Prerequisite for Net Zero









Be Lean: Energy Efficiency & DSM

Mean

Lean

Green

Clean

Invest in improving energy performance

- > Fabric first in buildings?
- > Process improvements
- > Other energy systems heat, light

DSM vs. DSR?

- > Behind the meter
- > Absolute energy savings (at point of use)
- > End-user vs. whole systems?
- > Adding controllable assets (EVs, AHUs)









Be Green: Renewables

Mean

Lean

Green

Clean

Onsite renewables

- > PV, wind
- > Heat pumps (or are they energy efficiency?)

Offsite renewables

- Linked by PPA
- > Green supply
- > Needs transparency, additionality

Where does storage fit in?









Be Clean: A new approach

Mean

Lean

Green

Clean

The old approach:

- > "Less" polluting gas, nuclear, CCS (all supply-side)
- > Locked into gas while grid decarbonises

Now: Local Energy Networks & Trading

- Integration of energy management, efficiency, mobility and onsite renewables
- > Storage to maximise renewables/finances
- > Lower distribution and system losses

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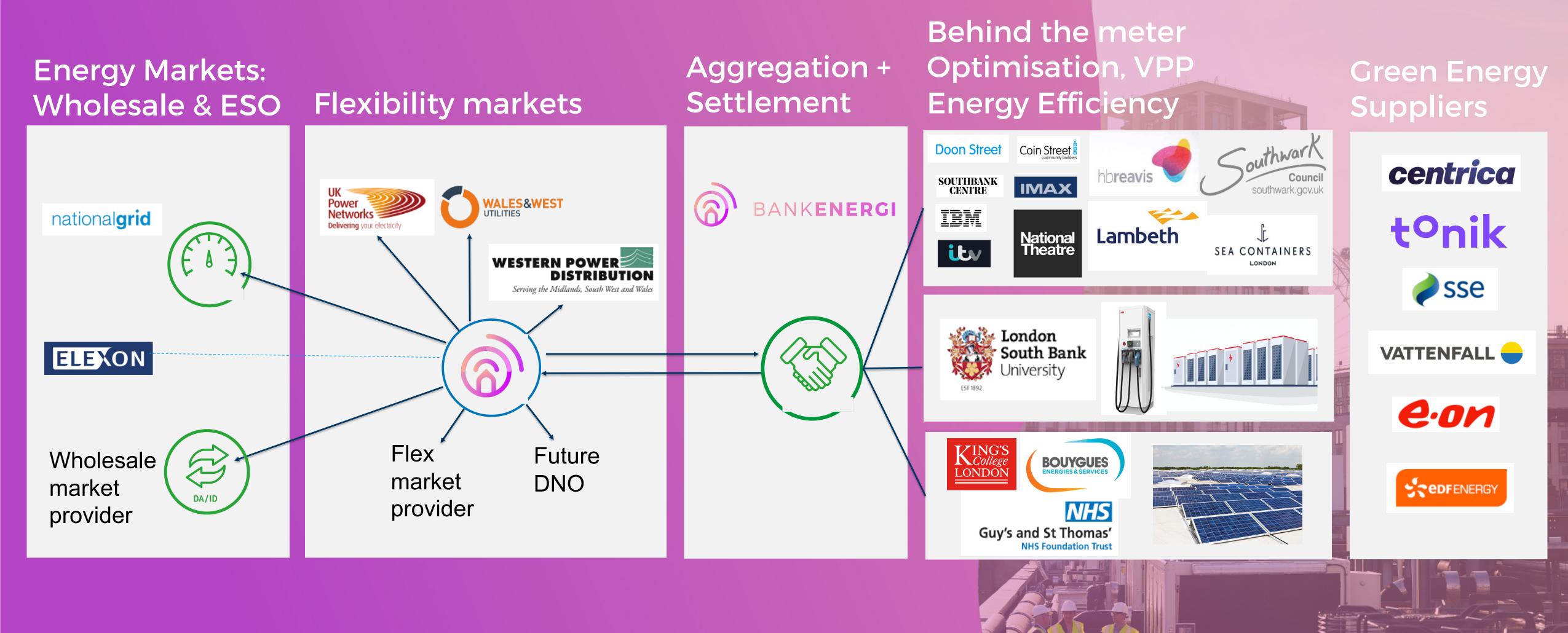
Solution: BankEnergi







Proving the Concept on London's South Bank





Business model & Intelligent data integration

Merit 1: DEMAND + FLEX

Merit 2: DEMAND + FLEX + STORAGE

Merit 3: DEMAND + FLEX + STORAGE + GENERATION

Merit EV: BATTERY & EV

E.g. Building – level data:

- Half-hourly energy for profiling
- Peak demands
- BMS information, operational data
- Space and land for asset deployment

E.g. Grid – level data:

- Forecasting demand to half hour.
- Substation level data e.g. headroom
- Generation assets data
- EVs: Likely time, routes & length of use
- Locations of charge points

Revenue Derivation - Power

Electricity Supplier

- Behind meter savings
- I.e.. kWh reduction
- I.e.. DUOS savings
- I.e.. TRIAD savings

Elexon

- Balancing Mechanism
- Day ahead wholesale trading

National Grid

- STOR serviceFFR service
- (Capacity Market)

UKPN

 Local DSR/STOR style services such as felx tenders

Offsite Renewable Energy

- Remote renewable electricity supply sources
- For green energy

BankEnergi

Aggregation
Operation
Financial settlement

BankEnergi Customer A
Office type

BankEnergi Customer B
University type

BankEnergi Customer C Hospital type BankEnergi Customer D Hotel type BankEnergi Customer E
Arts & Ents

EVC City Hub/ Transport

Battery Storage
Demand Side Response
turndowns – AHUs etc.
(Flex)
Optimisation

Battery Storage Rooftop Solar PV Electric Vehicle smart charging Battery Storage
Rooftop Solar PV
Demand Side Response
(Flex)
Combined Heat & Power
(CHP)

Battery Storage
Rooftop Solar PV
Demand Side Response
turndowns – AHUs etc.
(Flex)
Optimisation

Battery Storage
Demand Side Response
turndowns – AHUs etc.
(Flex)
Optimisation
Rooftop Solar

Electric Vehicle smart charging Battery Storage grid scale Solar canopies

Revenue Derivation - Heat networks

Electricity Supplier

- Behind meter savings
- le. kWh reduction
- le. DUOS savings
- Ie. TRIAD savings

Gas Supplier

Reduce reliance on gasEmissions reductions

e.g. CSR

District Heat Network ESCOs (Energy Centre)

- Heat Supplies
- Electricity supplies

BEISHNIP funding

Offsite Renewable Energy

Remote renewableelectricity sources –ASHP & GSHP

BankEnergi

Aggregation
Operation
Financial settlement

BankEnergi Customer A
Office type

BankEnergi Customer B
University type

BankEnergi Customer C Hospital type BankEnergi Customer D Hotel type

BankEnergi Customer E Arts & Ents

EVC City Hub/ Transport

Air Source Heat Pumps

Ground Source Heat
Pumps – Heating &
Cooling
Thermal Store
Phase Change material
District Heat Network
Inc. Waste heat recovery

Combined Heat & Power (CHP)
Thermal Store
Air Source Heat Pumps

Combined Heat & Power (CHP)
Thermal Store
Solar Thermal Hot Water

Pumps – Heating &
Cooling
Thermal Store
Phase Change material
District Heat Network

Ground Source Heat

Substation or battery heat recovery

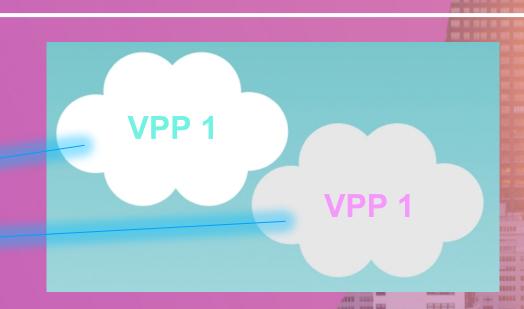
Building key enablers to realize full potential

ENERGY & FLEXIBILITY TRADING:



TECHNOLOGY DEPLOYMENT & GREEN SUPPLY CONTRACTS:





ASSET SELECTION & OPTIMISATION:











Conclusions

Mean

Lean

Green

Clean



- 1. There isn't a one size fits all:
- need to look at hierarchy
- DSR potential
- Asset deployment potential
- 2. The energy hierarchy and merit order are tools we can use, to consider site specific strategies
- 3. Green supply only is not the only solution look across the value chain including the revenues that can be derived from energy and flex trading at the LDNO, Nat Grid, Energy markets.

Greening the path to net zero