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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

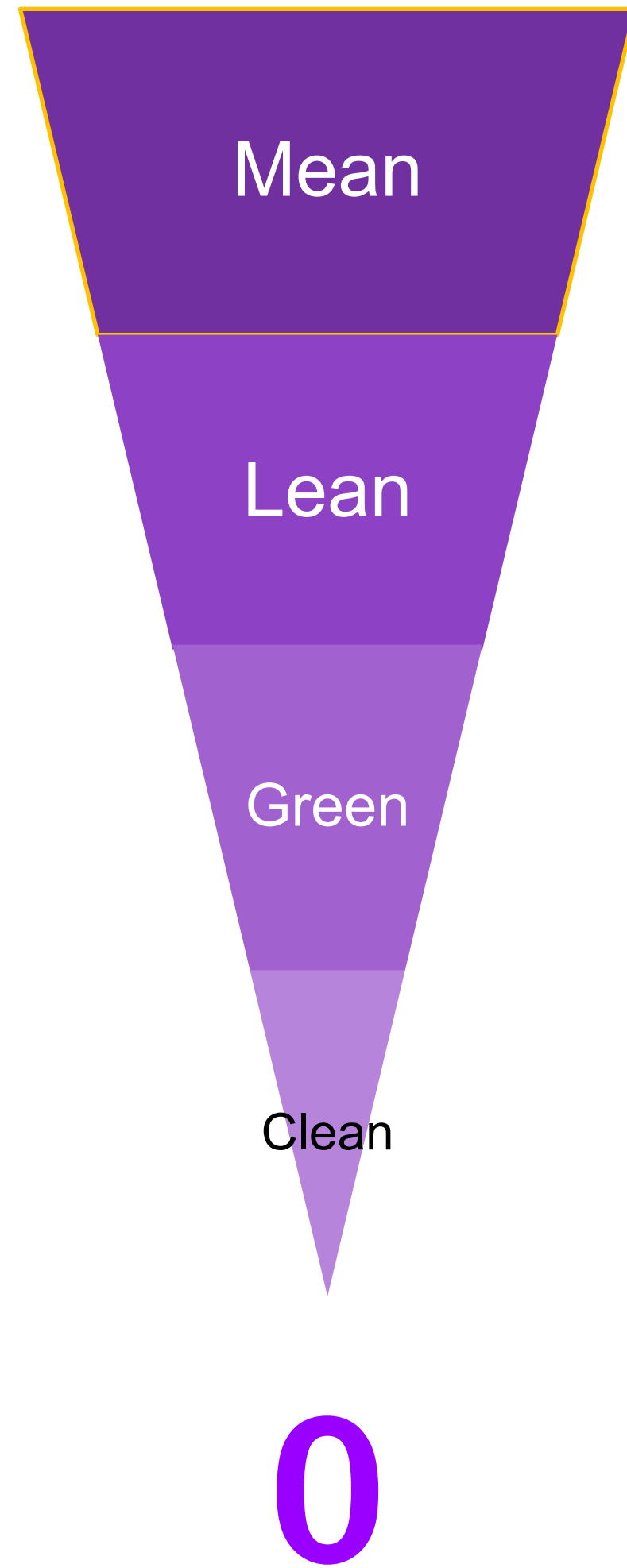


Starting local, going global

Rethinking the Energy Hierarchy



Be Mean: Avoiding Energy Use



Good management & housekeeping

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

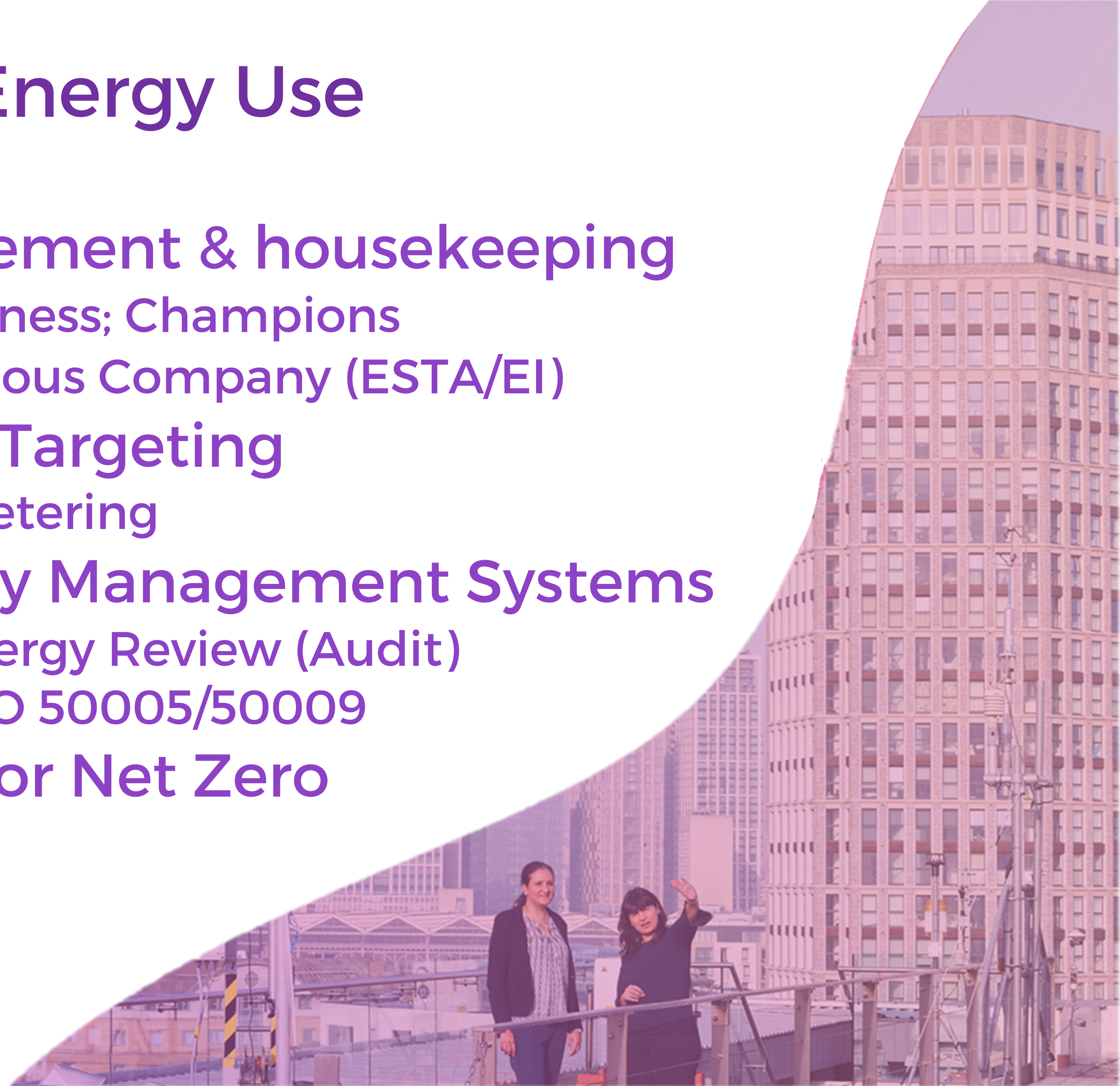
Monitoring & Targeting

- Half hourly metering

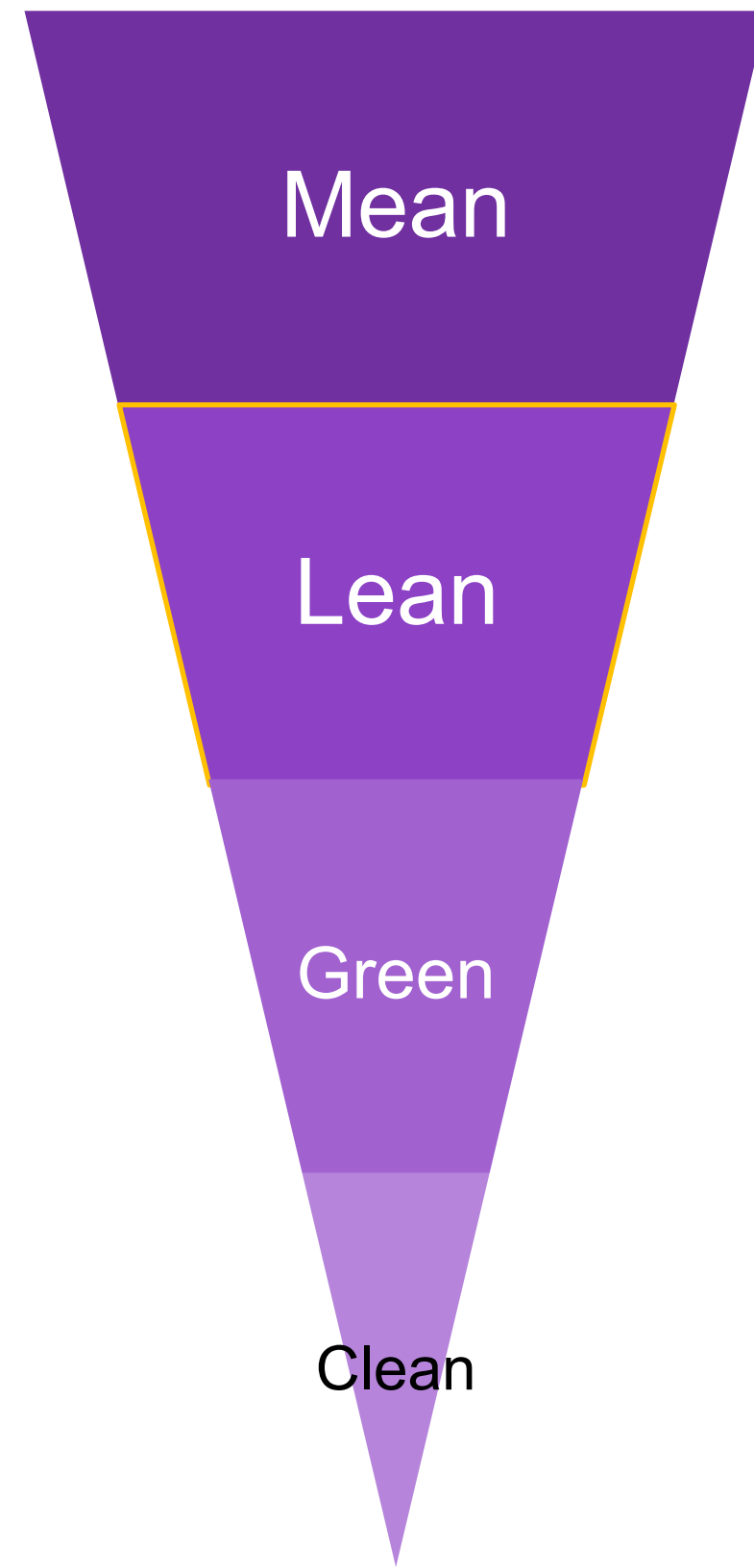
Formal Energy Management Systems

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

Prerequisite for Net Zero



Be Lean: Energy Efficiency & DSM



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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)

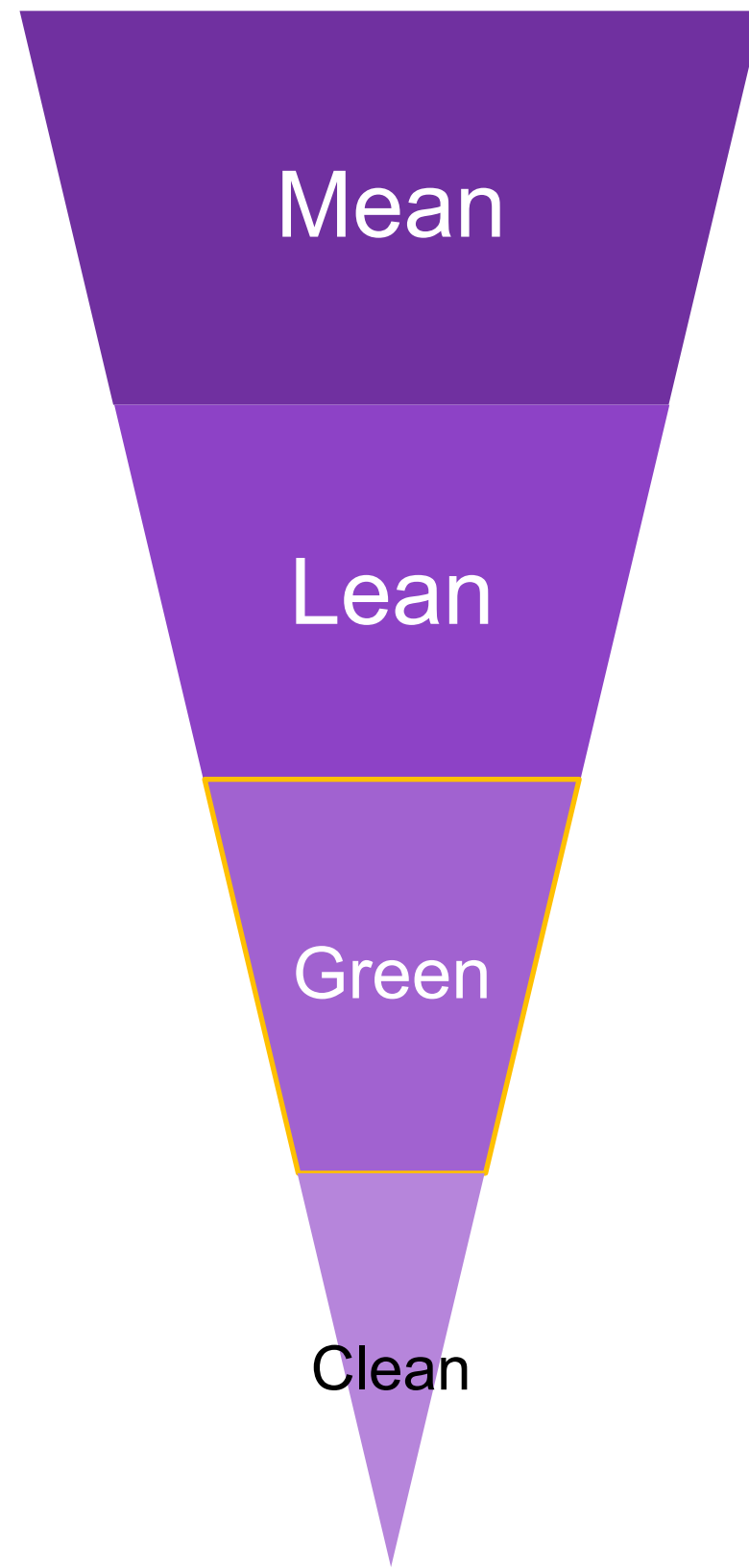


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Be Green: Renewables



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Onsite renewables

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

Offsite renewables

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

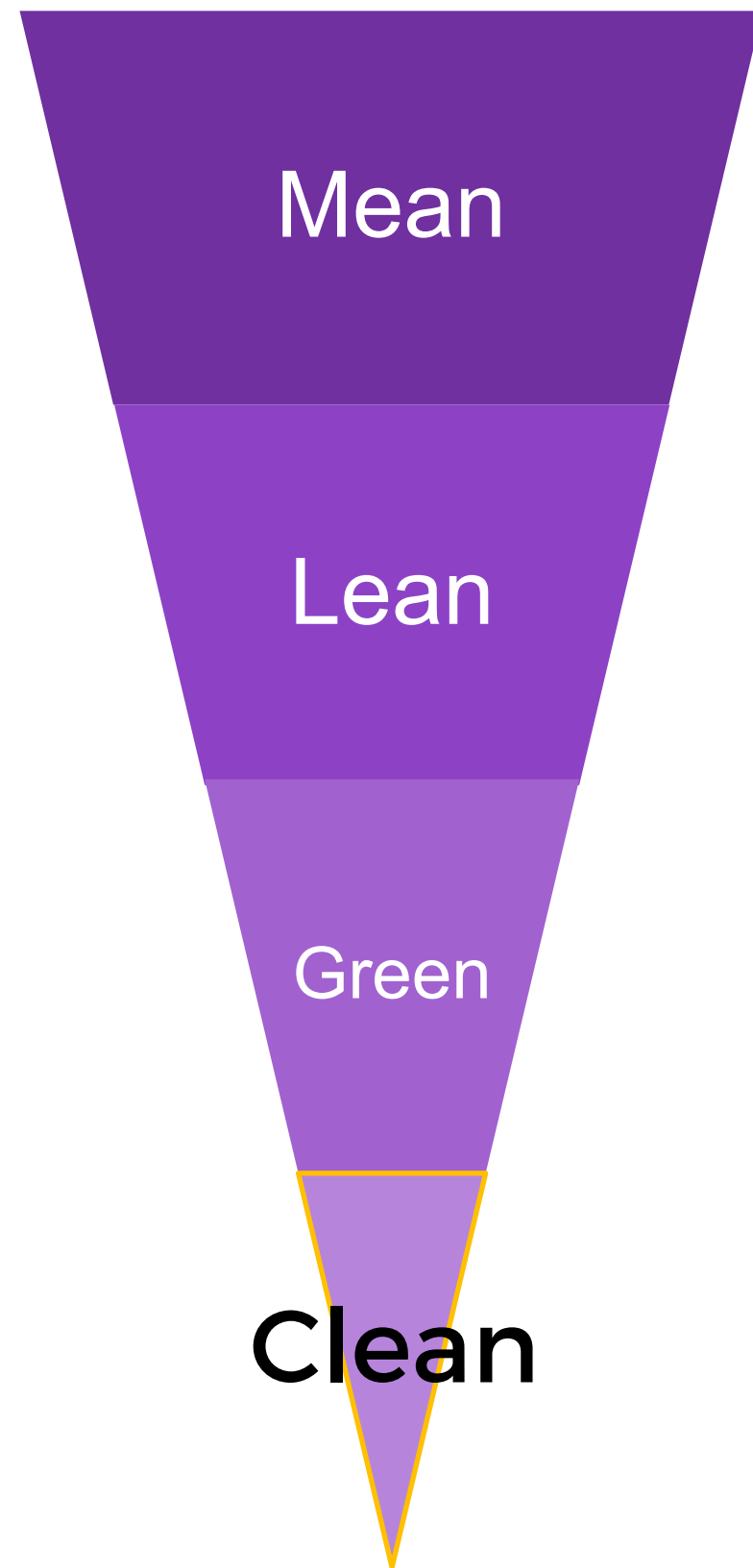
Where does storage fit in?



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Be Clean: A new approach



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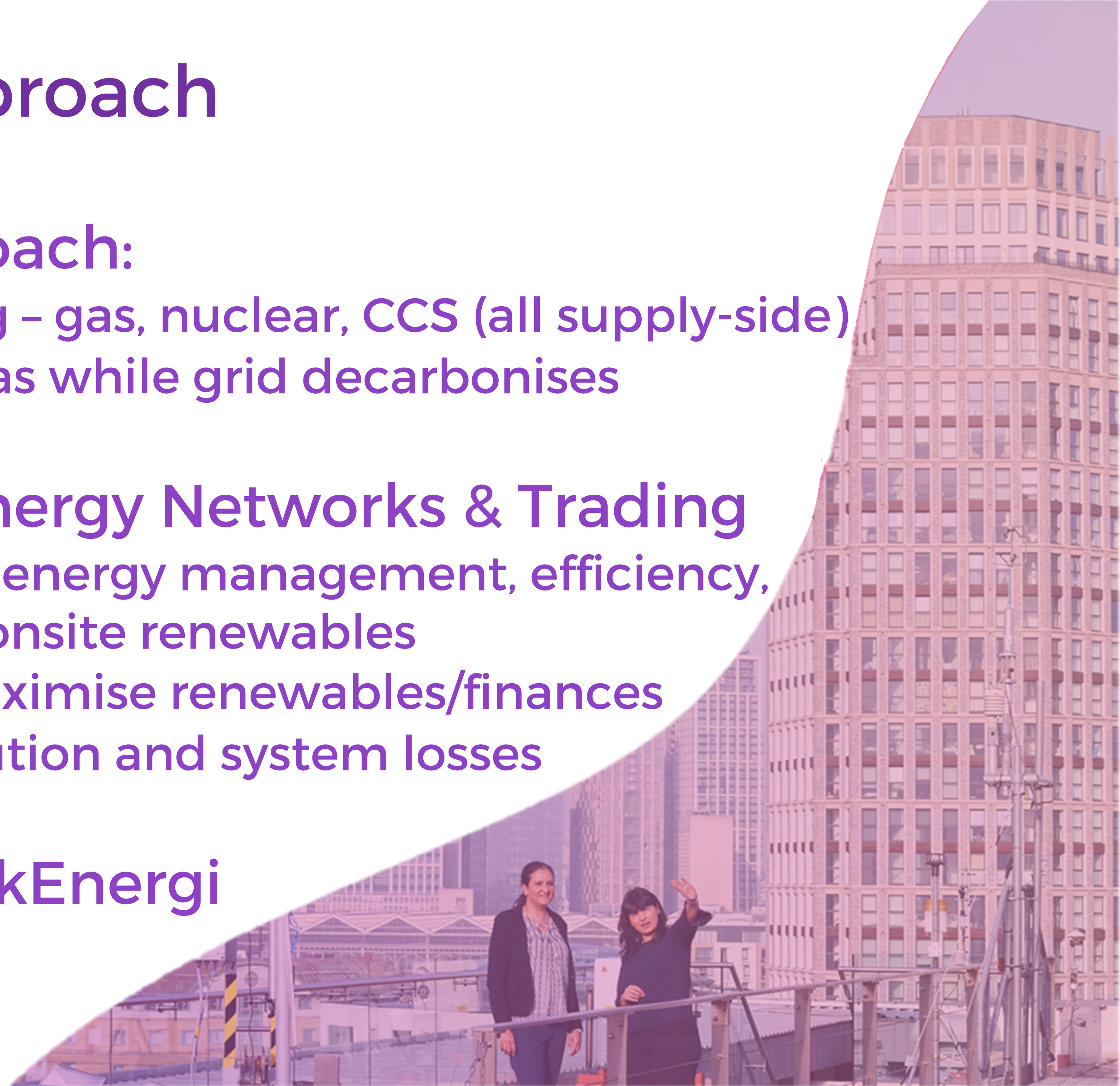
The old approach:

- “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

Solution: BankEnergi



Proving the Concept on London's South Bank

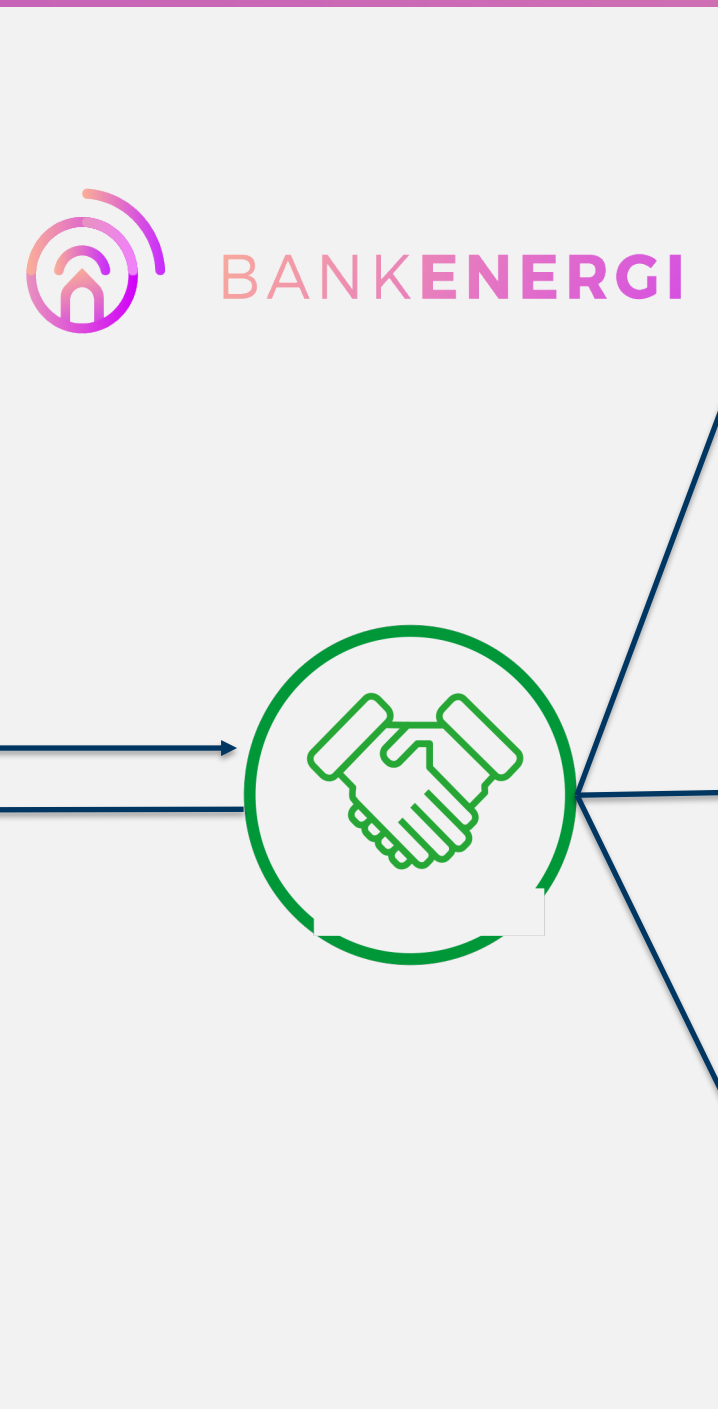
Energy Markets: Wholesale & ESO



Flexibility markets



Aggregation + Settlement



Behind the meter Optimisation, VPP Energy Efficiency



Green Energy Suppliers



Business model & Intelligent data integration

Merit 1: DEMAND + FLEX

**Merit 2: DEMAND + FLEX +
STORAGE**

**Merit 3: DEMAND + FLEX +
STORAGE + GENERATION**

Merit EV: BATTERY & EV

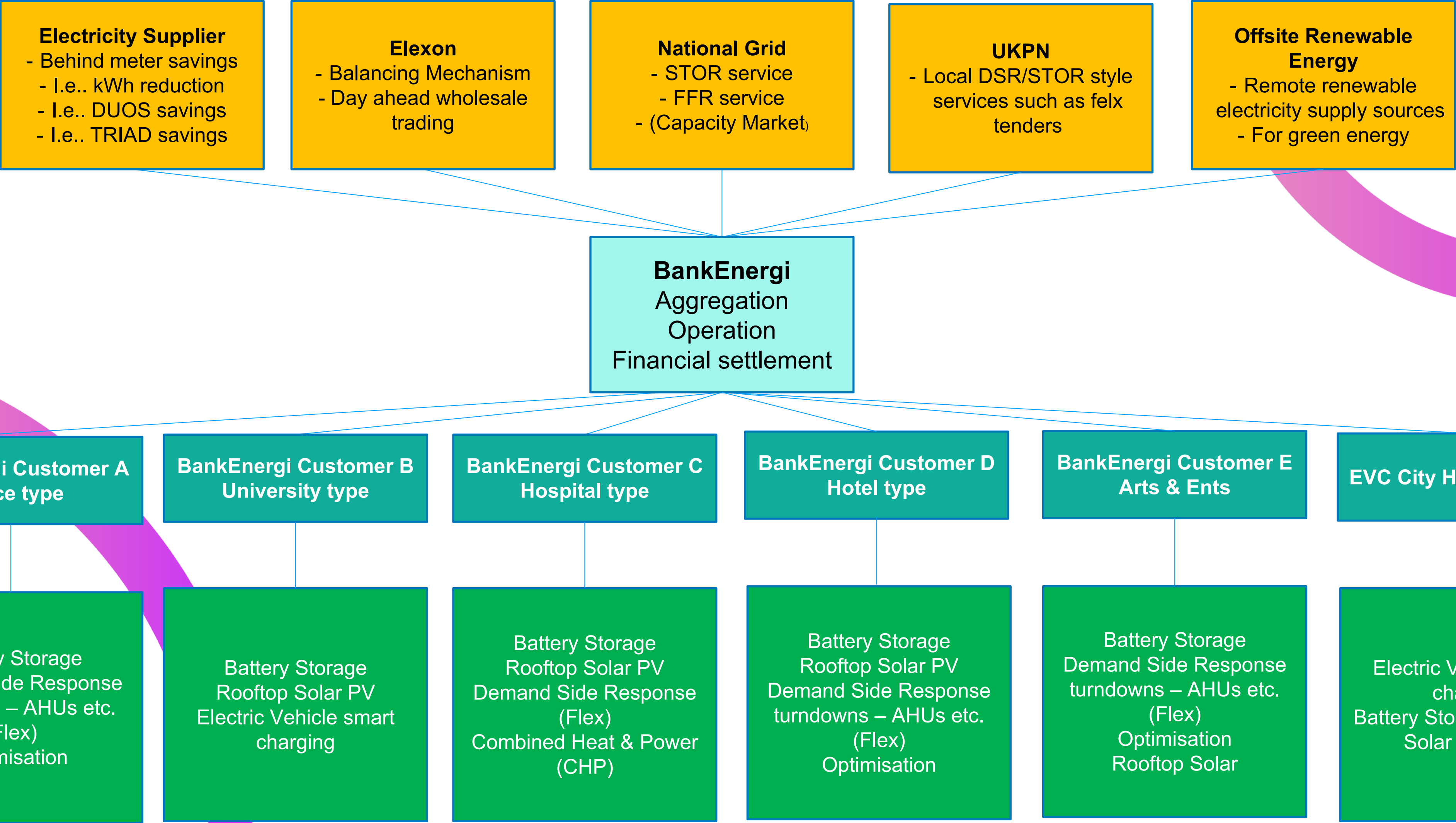
E.g. Building – level data:

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

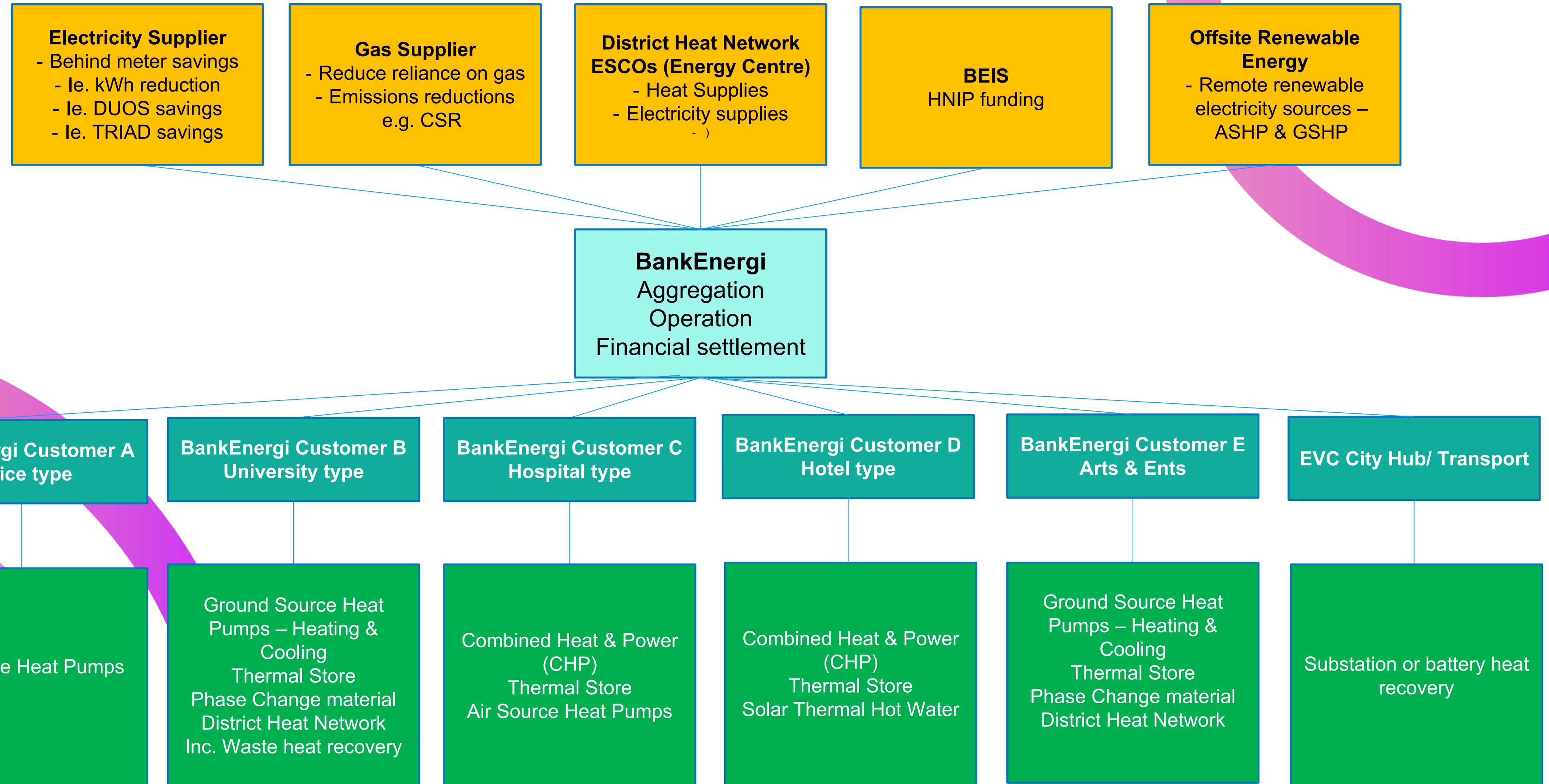
E.g. Grid – level data:

- 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



Revenue Derivation – Heat networks



Building key enablers to realize full potential

ENERGY & FLEXIBILITY TRADING:



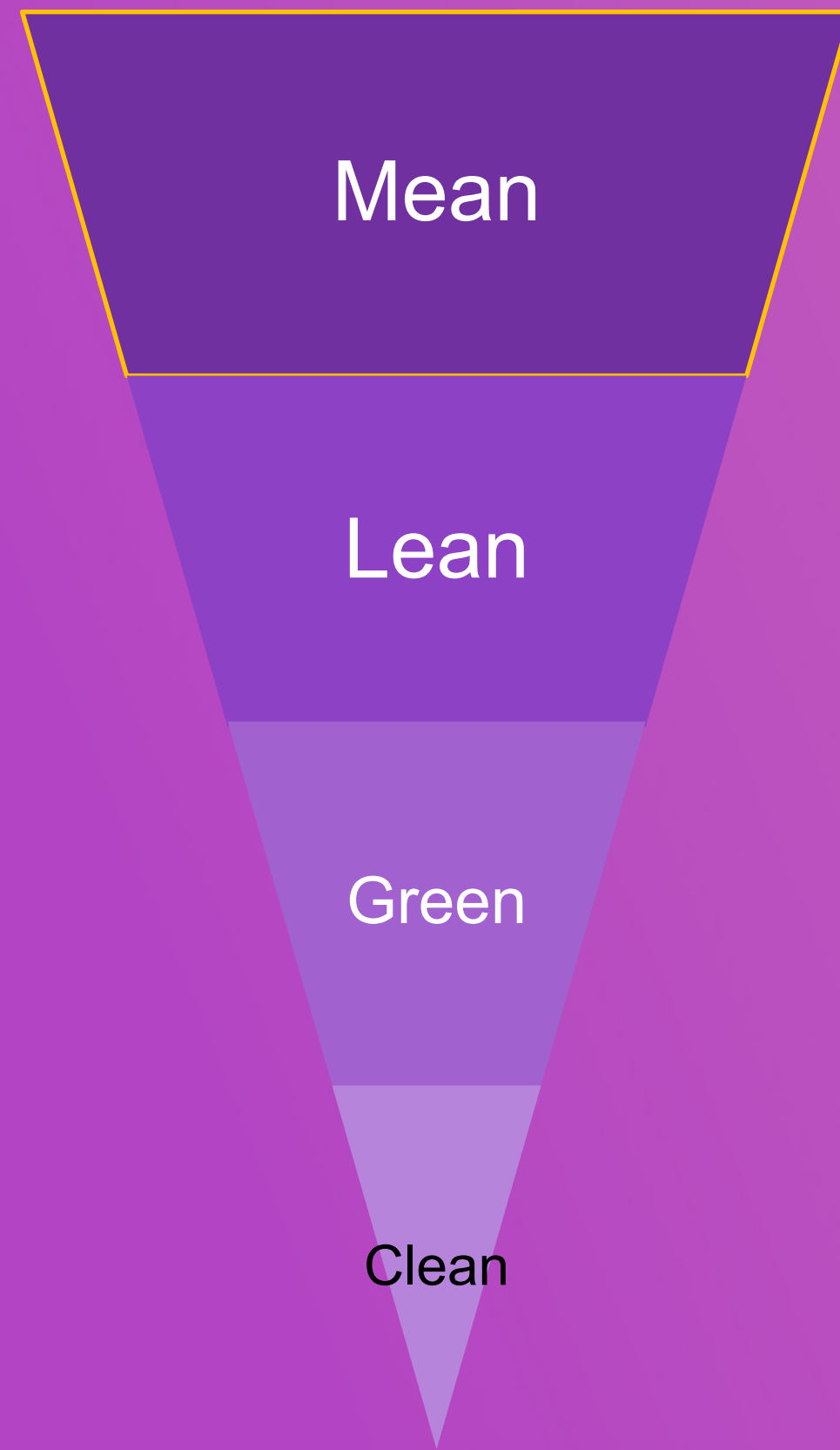
TECHNOLOGY DEPLOYMENT & GREEN SUPPLY CONTRACTS:



ASSET SELECTION & OPTIMISATION:



Conclusions



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.



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