

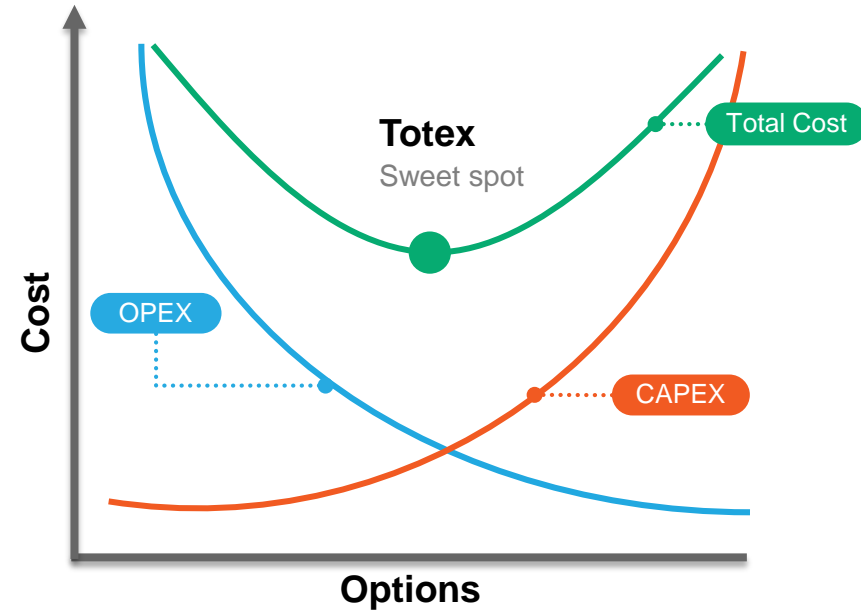
# The Need for Cultural Changes to Embrace New Technologies & Best Asset Management in the Quest to Deliver TOTEX Solutions

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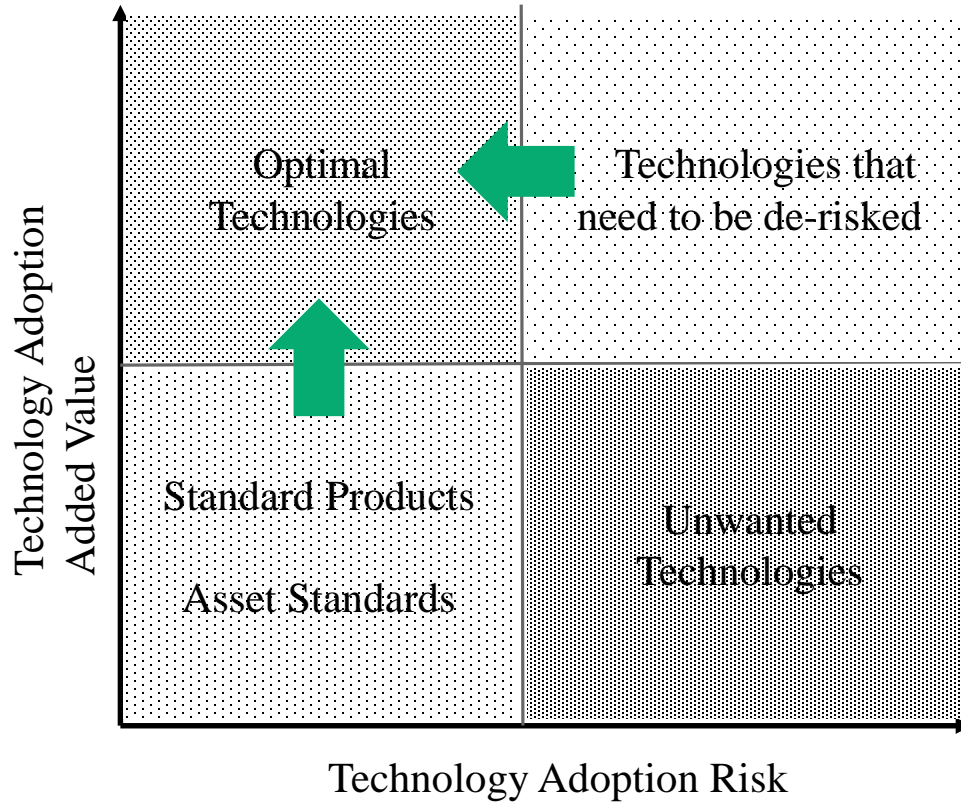
# Opex Vs Capex

- AMP6 delivery partners majority incentivised via CAPEX.
- Water utilities decisions based on TOTEX and sustainability.
- Designers required to develop options.
- Solution options assessed in workshops.
- Water utilities approve a solution usually on lowest TOTEX and lowest carbon footprint.
- Is this the only TOTEX solution?
- Designers could seek options biased towards OPEX to deliver a **TOTEX<sup>+</sup>** solution.



*Challenge - If the Designer is given a free hand, would the TOTEX solution be different to the Designer under a Capex incentive?*

# Utilising New Technologies for Totex+ Solutions

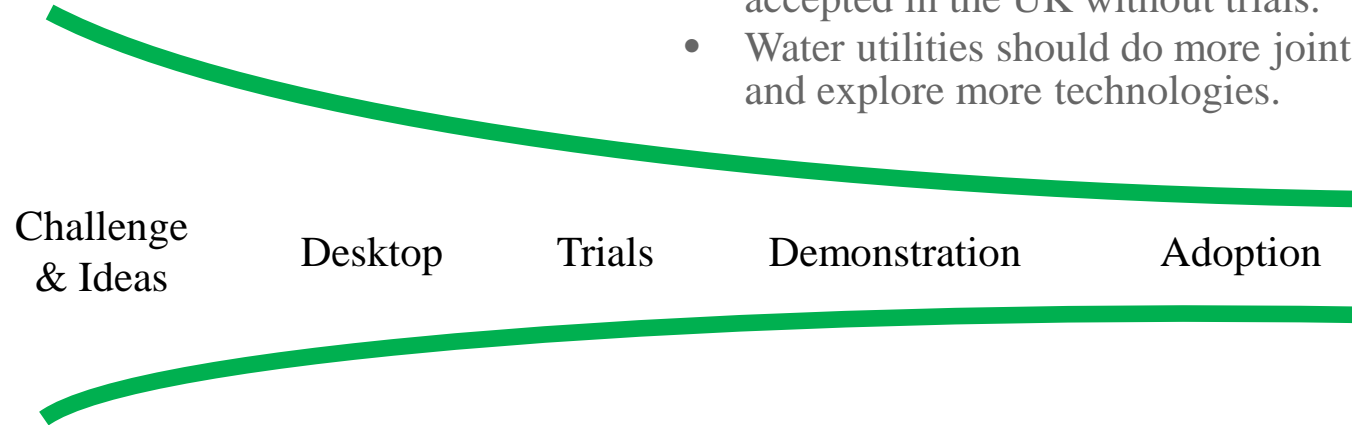


*Challenge – How to de-risk adoption of new technologies?*

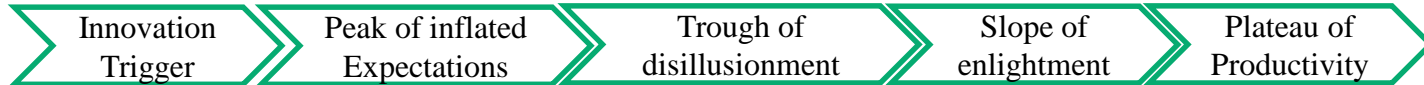
# De-risking Adoption of New Technologies

Water Utilities typically follow established business processes comprising:

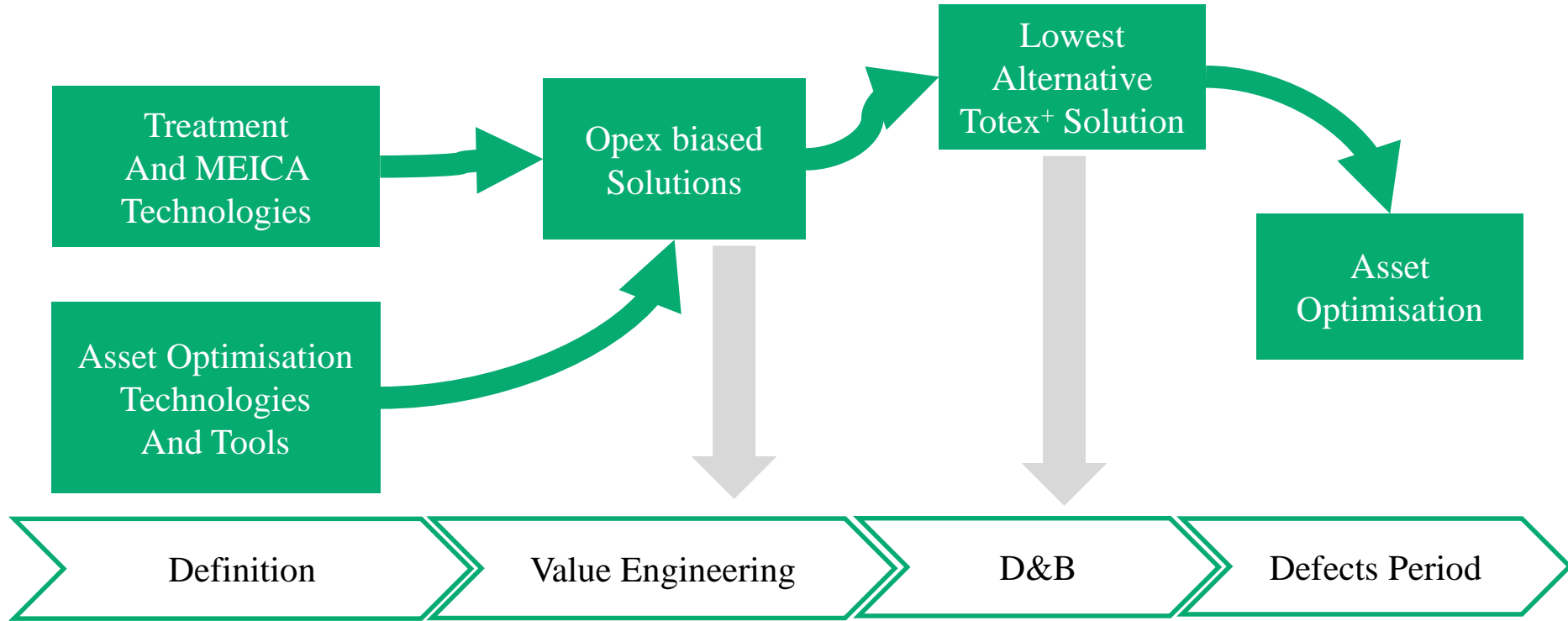
- But funnels are time expensive. 'Short' or 'Vertical' runway options needed.
- Water utilities need to adopt de-risking processes to adopt new technologies in the time frame of the project.
- Mainland Europe established technologies are not accepted in the UK without trials.
- Water utilities should do more joint R&D programmes and explore more technologies.



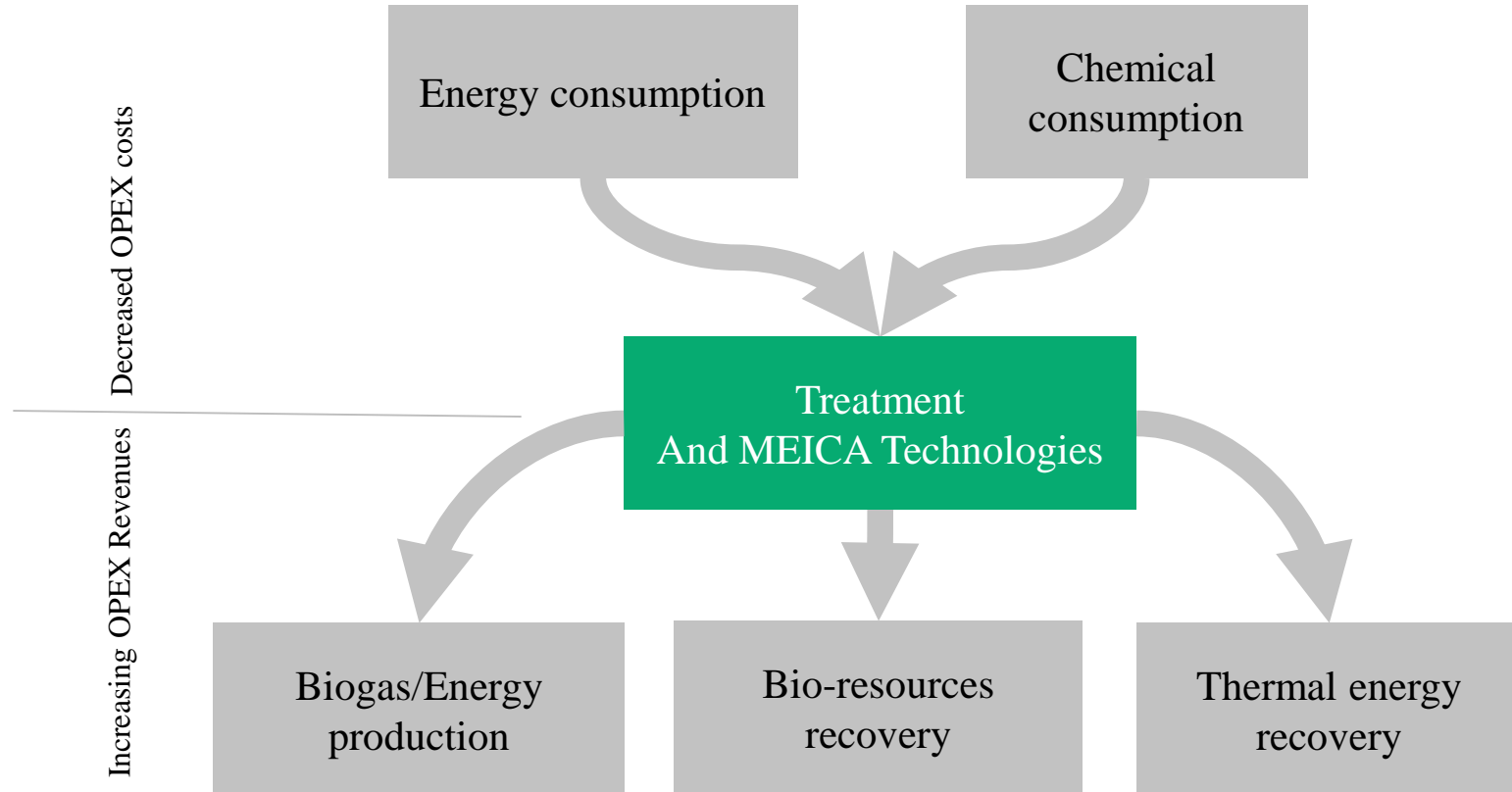
Source: Gartner hype cycle



# Optimum Totex+ Solutions Approach



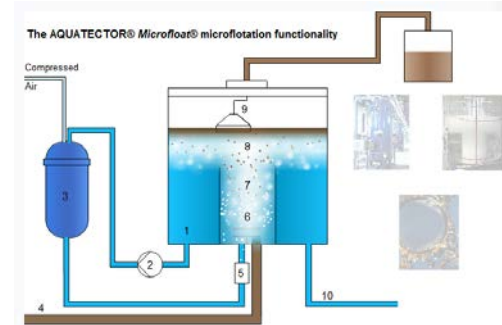
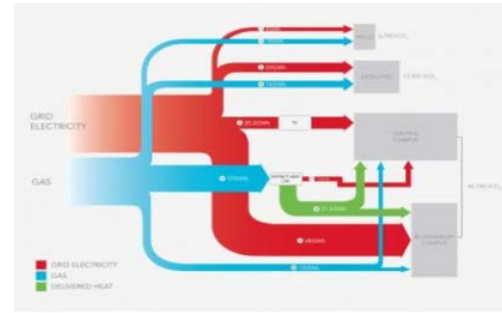
# Treatment and MEICA Technologies



# Treatment and MEICA Technologies

## Energy Consumption and Production

- Designers should undertake electrical and thermal energy consumption analysis e.g. Sankey diagrams.
- Maximised mainstream primary sludge capture rate for biogas production.
- Mainstream secondary treatment e.g. Nereda and BioCOS.
- Renewable energy resources & storage.



Enviplan®'s micro DAF achieving up to 99% solids capture

Yorkshire Water's Loftsome Bridge WTW – 2 x 1.3MW turbines with 30m blades



# Treatment and MEICA Technologies

- Sludge treatment maximised biogas production using AAD and advanced sludge cracking processes e.g. pyrolysis & gasification.
- Advanced forward thinking PLCs or Real Time Controllers.

## Chemicals reductions and Bio-resources Recovery

- Mainstream biological removal/recovery of Phosphate instead of Fe dosing.
- Sludge recovery of cellulose, biopolymers, Alginate, bio-plastics & CO<sub>2</sub>.
- Side stream removal of Ammonia & recovery of Phosphate.

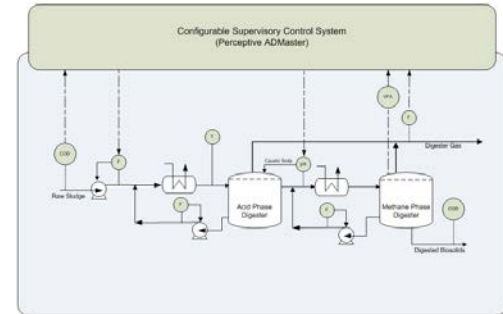
## Thermal Energy Recovery

- Thermal energy recovery from sewers.

**Aqualogy's Degres Bleus HEX generates 2-5kW/m<sup>2</sup> of heat**



**Violia's BioThelys™ AAD for Yorkshire Water's Esholt WwTW**

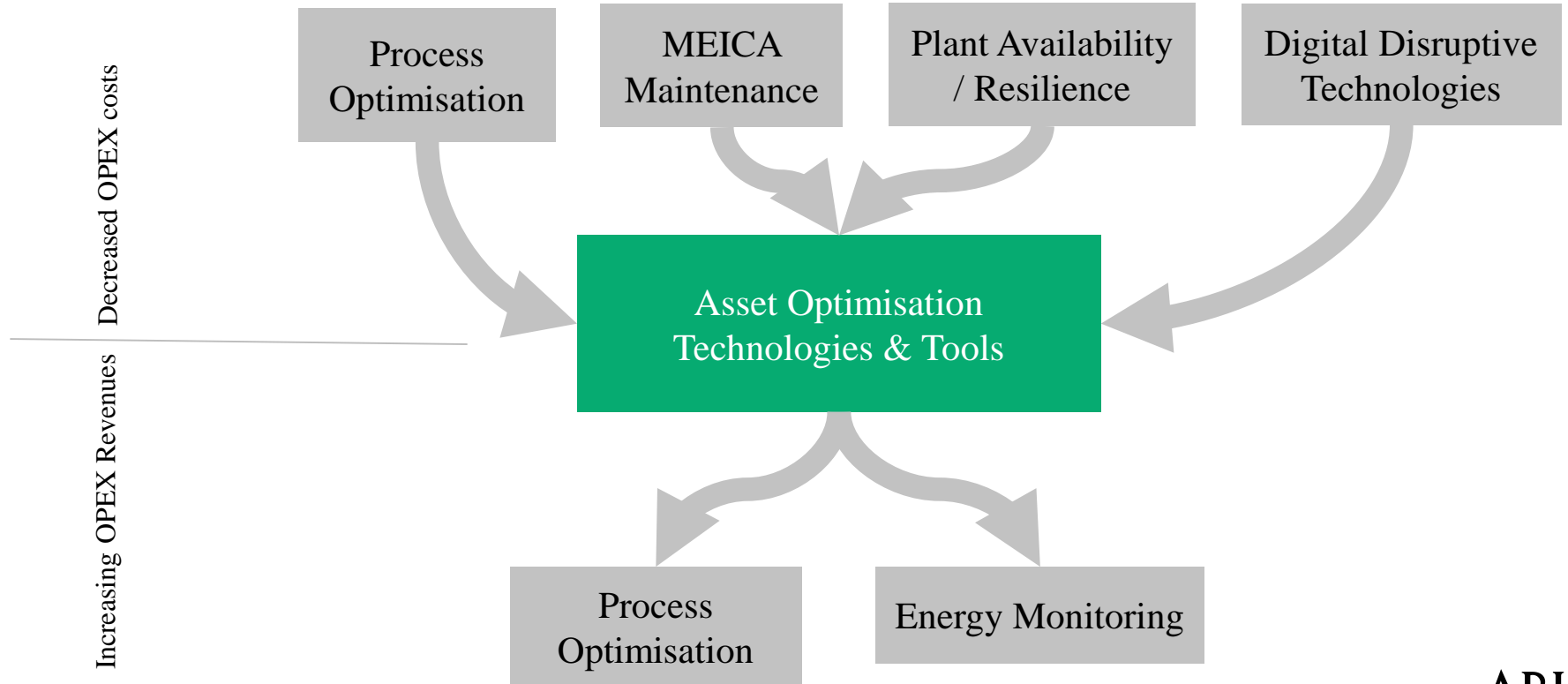


**Perceptive Engineering's APC for AD plant**

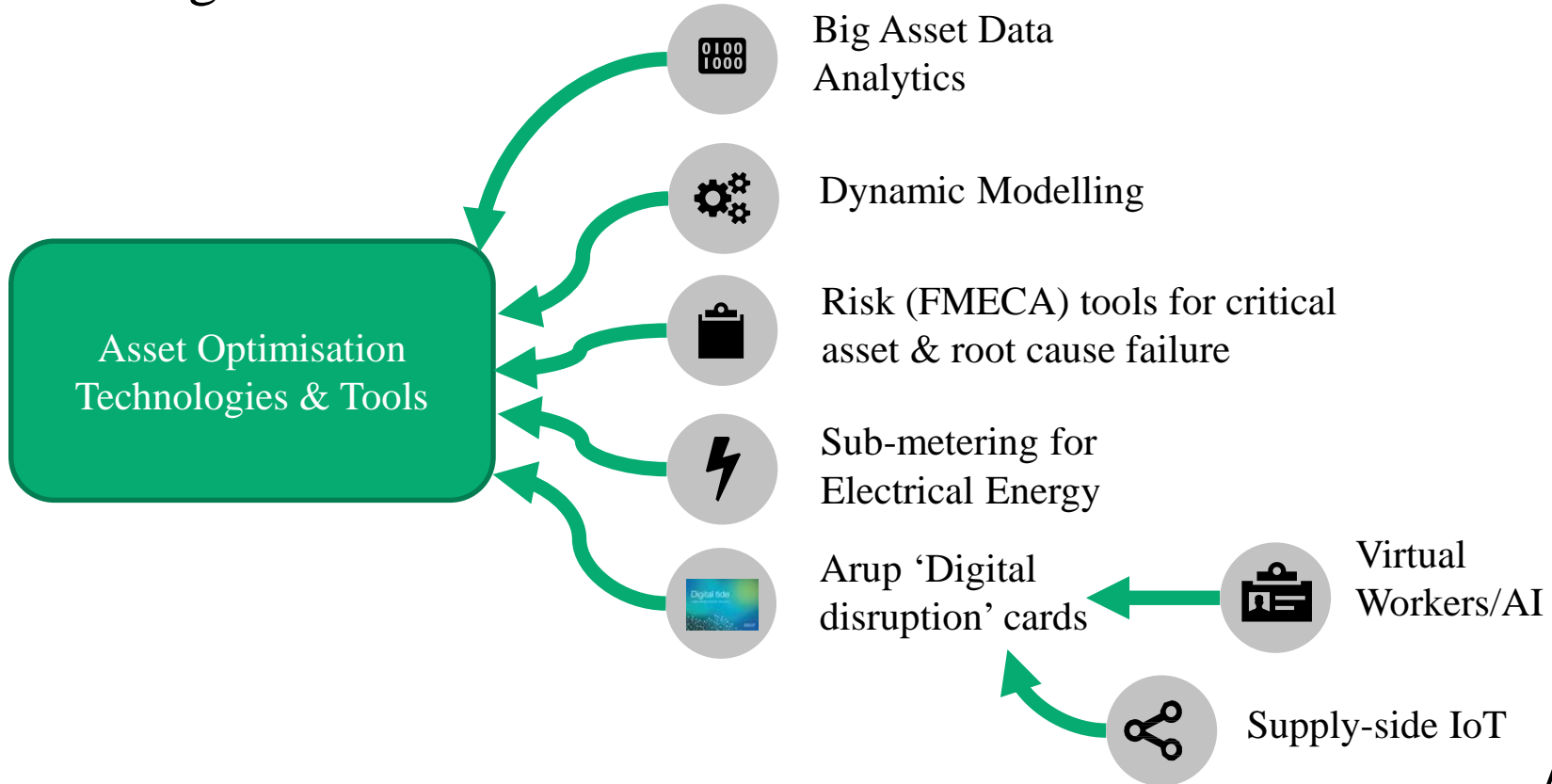




# Asset Optimisation Technologies and Tools



# Asset Optimisation Technologies and Tools



# Summary

- Challenge the designers to consider OPEX biased solution(s) as part of the **TOTEX<sup>+</sup>** journey.
- Seek business processes that de-risk and allow agile adoption of new technologies.
- Let the Designers embrace the new technologies and asset optimisation tools as part of options development.
- Empower the Designers to deliver your real lowest **TOTEX<sup>+</sup>** solutions.

Thank you