



EPC Implementation

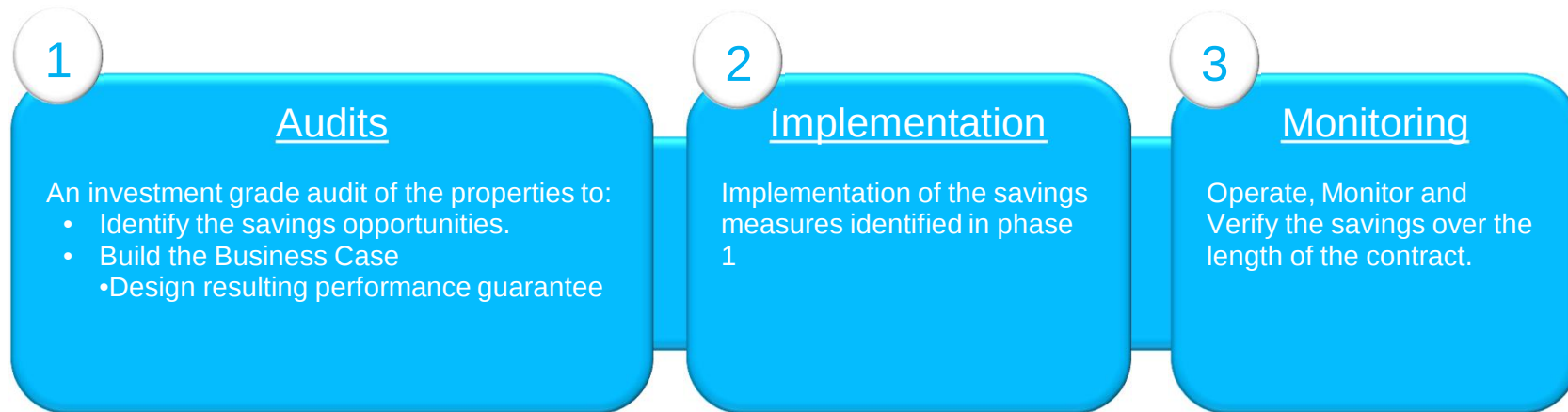
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What is an Energy Performance Partnership?

The three practical elements of an EPP usually consist of:



Most EPP's are broken down into the standard 3 phases of an EPP:

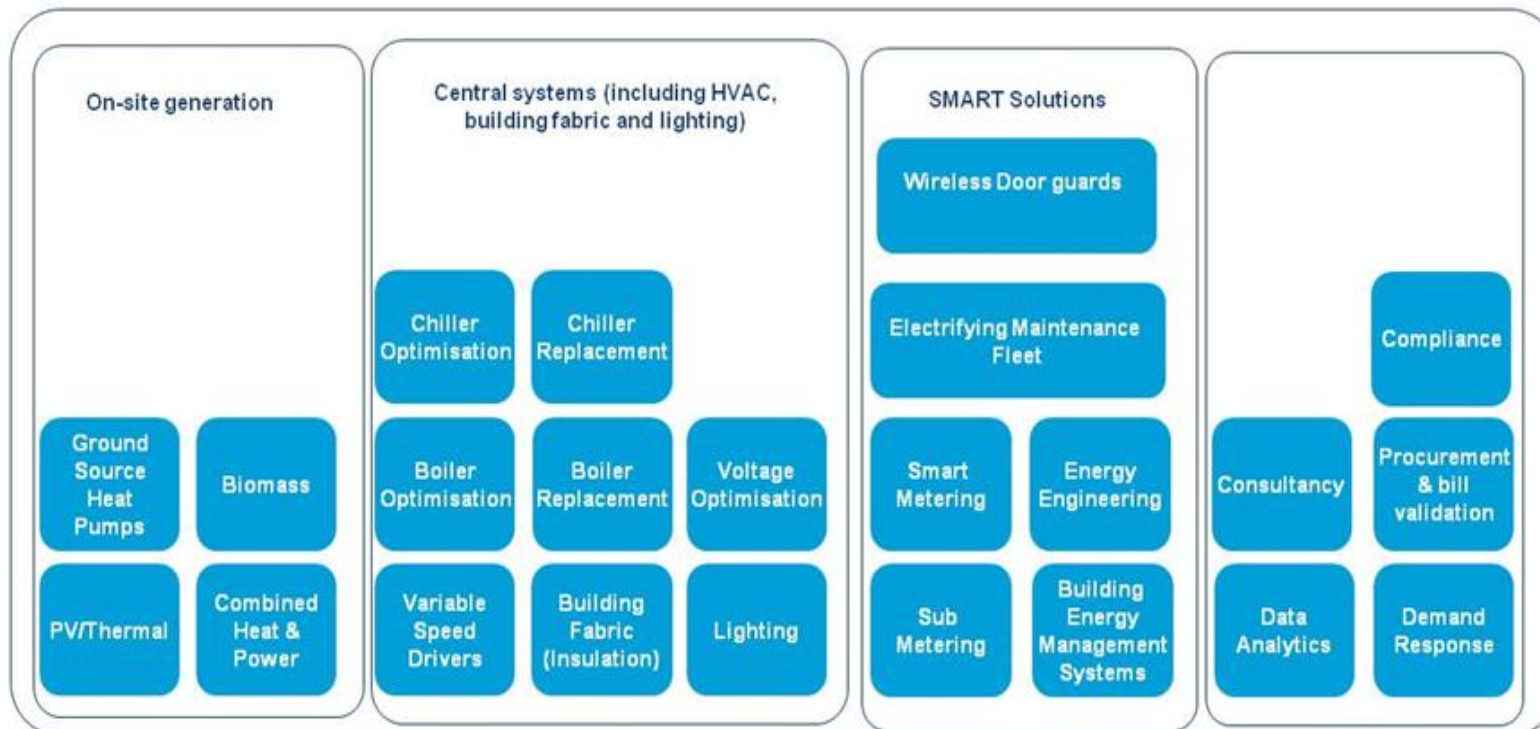
Phase 1:-Production of a site survey and analysis of site infrastructure and procedures relating to current and future activities and to then present to the customer with a business case and detailed statement of works.

Phase 2:- Construction, Implement the measures as agreed.

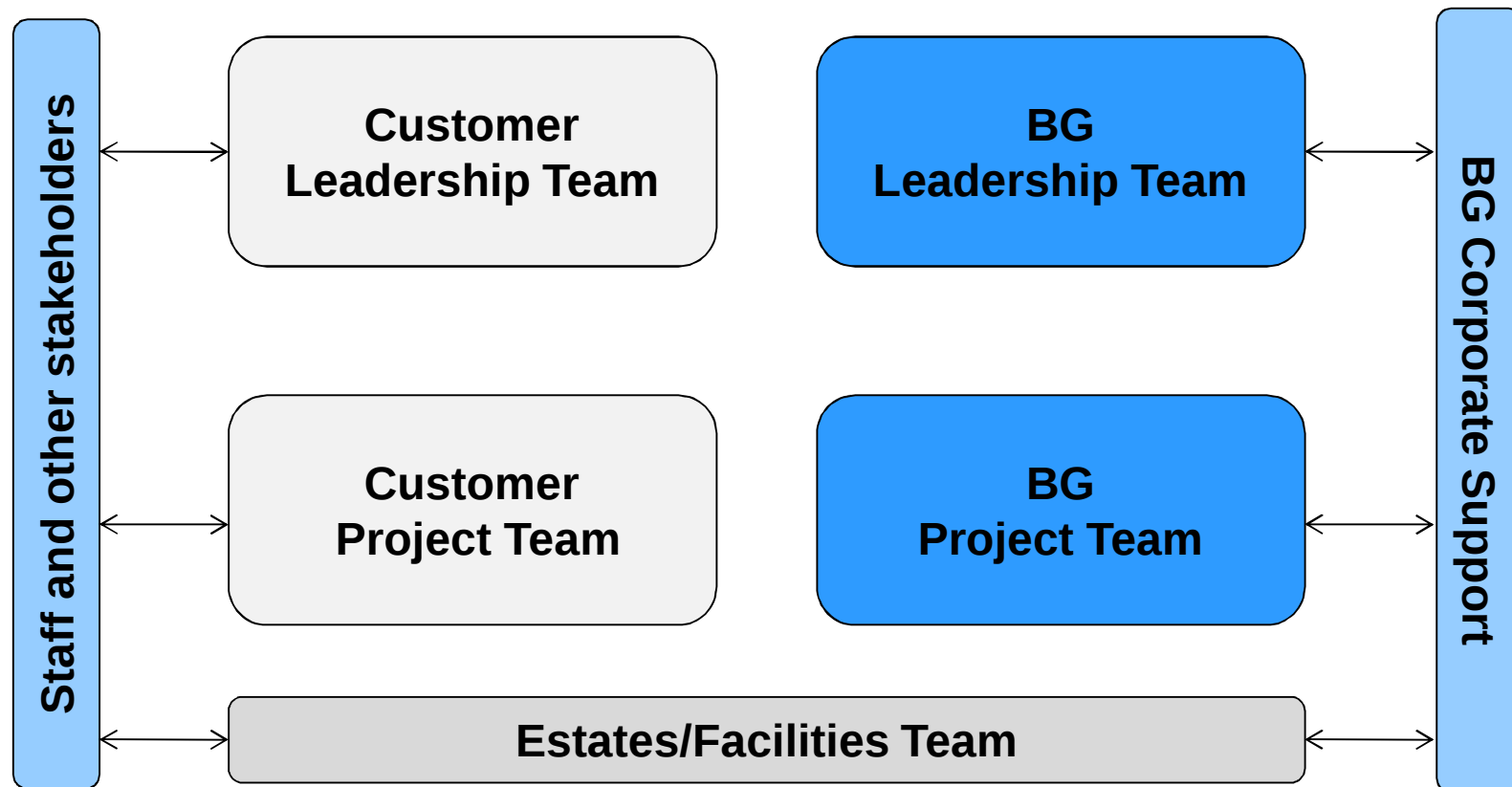
Phase 3:- Monitor and Verification, report savings achieved.

What do Energy Performance Partnerships Deliver

EPP's Work because the bundle a wide range of technologies and innovation in sustainability without this bundling of all these key areas and EPP will fail.

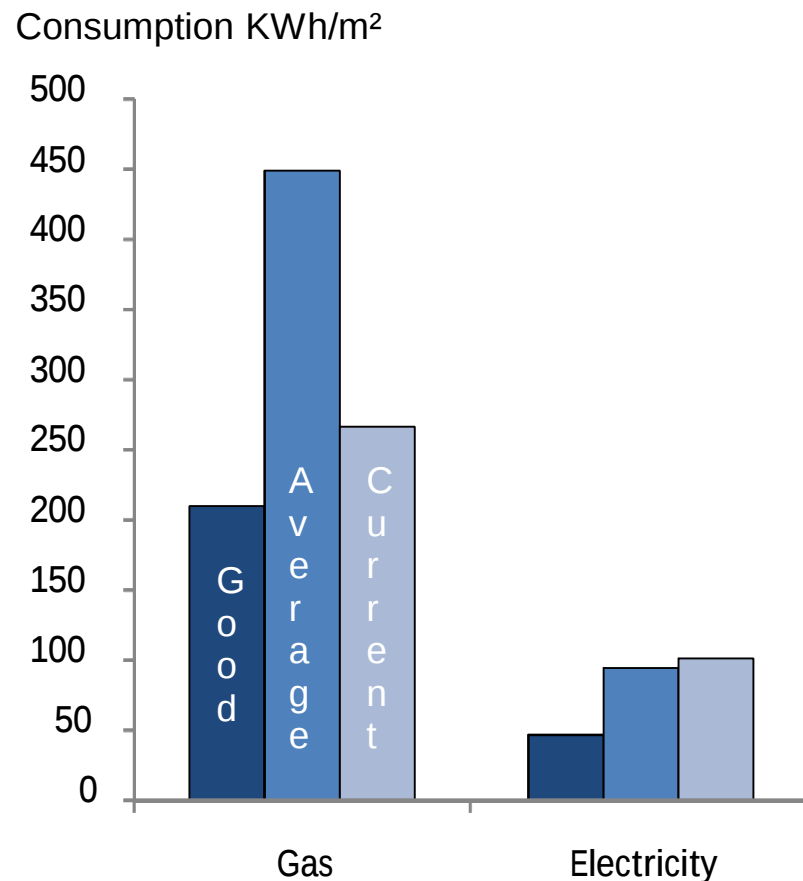


A typical partnership structure for the project

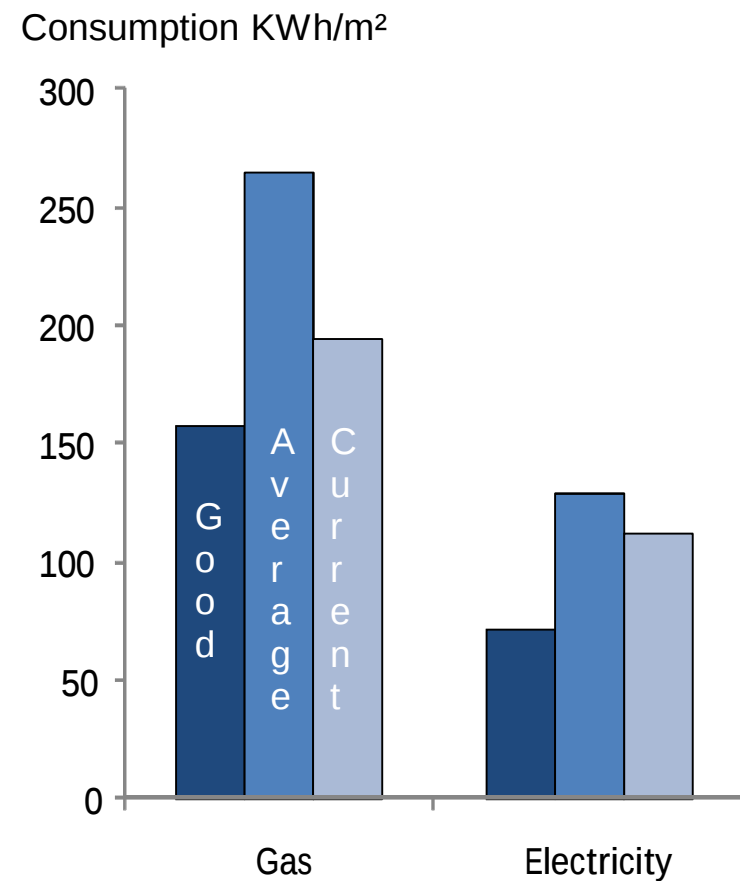


Example desktop analysis

**Benchmark comparison for
Building X (with CHP)**



**Benchmark comparison for
Building Y (without CHP)**



Building audit output and option appraisal

Criteria	Score out of 5						
	Lighting retrofit	HVAC Upgrade	Central Plant & Utilities	Electrical ADR & STOR	BMS & Auto Controls	Water supply & demand	Awareness & Training
Savings & revenue	4	2	5	5	3	3	1
Energy & water savings	4	3	3	0	2	1	1
Emissions reductions	4	2	2	0	3	1	1
Complexity	5	3	1	3	3	4	5
Simple Payback	4	3	2	5	3	5	0
Enhanced operations	3	3	5	2	5	2	5
Guarantee in EPC?	5	4	4	0	4	3	0
Totals	29	20	22	15	23	19	13
Rank	1	4	3	6	2	5	7

Application of renewable technologies

Criteria	Score out of 5								
	Building Integrated PV	Ground mounted PV	Solar Thermal	Building Integrated Wind	Remote Wind	Biomass	Geothermal Open Loop	Geothermal Closed Loop	Fuel Cell
Technology maturity	4	4	5	2	4	2	3	3	1
Energy savings	1	1	2	1	3	2	2	2	2
Emissions reductions	3	3	2	2	3	4	2	2	3
Complexity	4	3	4	3	4	2	2	2	1
Compatibility with site constraints	4	2	3	2	3	3	3	3	2
Compatibility with other measures	4	4	1	4	4	3	2	2	2
Planning Constraints	3	2	3	1	1	3	2	3	4
Cost saving/Revenue	1	1	1	1	3	3	2	2	2
Totals	24	20	21	16	25	22	18	19	17
Rank	2	5	4	9	1	3	7	6	8
Suggested viability at this stage (RAG)	Green	Yellow	Yellow	Red	Green	Yellow	Red	Red	Red

Monitoring and verification strategy

1. Determining the real starting point

- Understanding interdependent variables
- Tracking previous, existing and future usage
- Regression analysis of other factors e.g. weather
- Normalised baseline produced in line with IVMVP protocols



2. Agreeing M&V methodology and confirming savings

- A standard M&V methodology proposed
- M&V software (built to IPMVP standards) used to monitor savings



3. Re-baselining

- Importance of flexibility
- Methodology reflect expansion or contraction on site
- Collaboration with estates/facilities key



Financial Modelling

Example Measure Selection Table

Include?	Recommended Base Measures	Installation Cost	Annual Savings	Simple Payback (Yrs)
☒	Central Heating Plant Renewal	£500,000	£160,000	3.1
☒	Lighting Retrofit	£250,000	£60,000	4.2
☒	Motor and Fan Optimisation	£120,000	£60,000	2.0
☒	Heat Recovery	£100,000	£20,000	5.0
☒	Water Conservation	£80,000	£20,000	4.0
	Total	£1,050,000	£320,000	3.3

Example Renewal and Asset Renewals

Include?	Recommended Base Measures	Installation Cost	Annual Savings	Simple Payback (Yrs)
☒	Wind Turbine	£400,000	£40,000	10.0
☒	Decentralised Biomass Boiler Plants	£150,000	£20,000	7.5
☒	Group Source Heat Pump Conversions	£140,000	£20,000	7.0
☒	Thermal and Solar PV	£150,000	£15,000	10.0
☒	Water Conservation	£80,000	£20,000	4.0
	Total	£920,000	£115,000	8.0

Composite Project

	Installation Cost	Annual Savings	Simple Payback (Yrs)
TOTAL	£1,970,000	£435,000	4.5

Final IGA Report Contents

- **Final report of agreed Measures**
- **Commercial Model**
- **Financial model**
- **Technical Overview**
- **Programme Sheet**
- **Detailed Implementation Programme**
- **Metering strategy**
- **Agreed Measurement and Verification Option(s)**

Managing the construction phase

Processes to minimise disruption

- § Review existing operations and integrating with your staff
- § Maximise use of existing operational knowledge
- § Understand processes and work patterns to plan work efficiently and utilise staff time wisely
- § Staff to support installation, ensuring the best site knowledge.

Collaborative risk management

- § Operation of a joint risk register
- § Risk register for the entire EPC contract
- § Work timings sequenced to try to reduce demand on energy consumption
- § 24hr monitoring during construction phase of any temporary measures

Owning and managing the implementation phase

BG are principle contractor with a dedicated construction management team

- Taking full responsibility for the delivery of all projects and delivery of energy performance improvements

Internal and external delivery capability

- Market testing to ensure best value for the long term

Open book accounting

- Transparency through all our activity
- No claw backs from suppliers

Creating solutions that are to customer needs

NHS example



Exterior

A recognisable landmark.



Hospital offices

Allow individuals to control their own workspace where possible.



Entrance area

A welcoming ambience, facilitate communication, and create a comfortable working environment.



Patient rooms

Less clinical, more welcoming rooms. Give patients better controlled temperature and lighting.



Waiting rooms

Create a fresh, comfortable experience. Communicate hygiene with an bright and clean atmosphere.



Operating theatres

Reduce glare, shadow and improved performance. Improve patient observation. Fresh and vibrant theatres with air management



Corridors, outdoor and parking

A secure, easily navigable environment using smart lighting



On-site renewable generation

Renewables to reduce reliance on grid power, reduce CO2 emissions and demonstrate Trusts' green credentials