



The Radyr Weir Scheme – experience from Cardiff

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Radyr Weir Hydro Scheme

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ENERGY MANAGEMENT

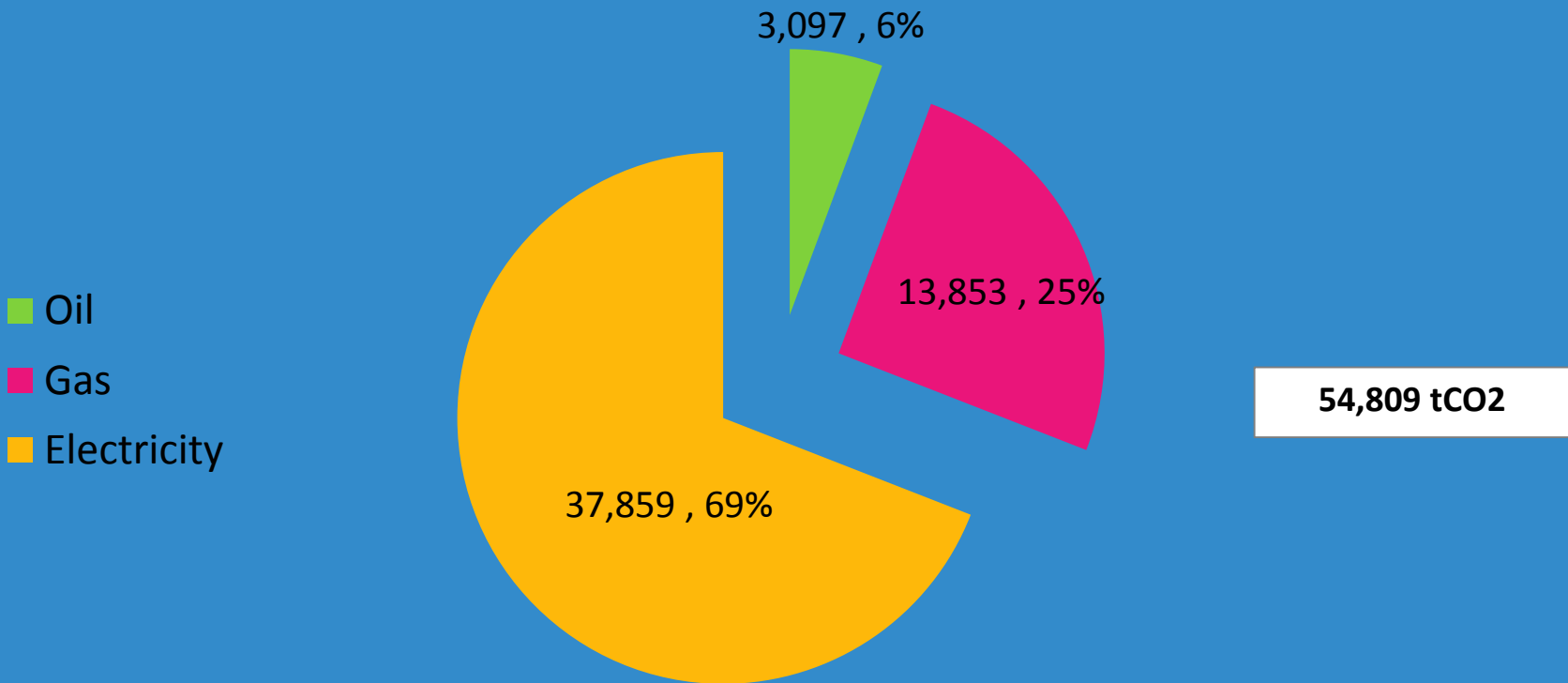


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Our Carbon Impact (tCO₂/year)



- Oil
- Gas
- Electricity

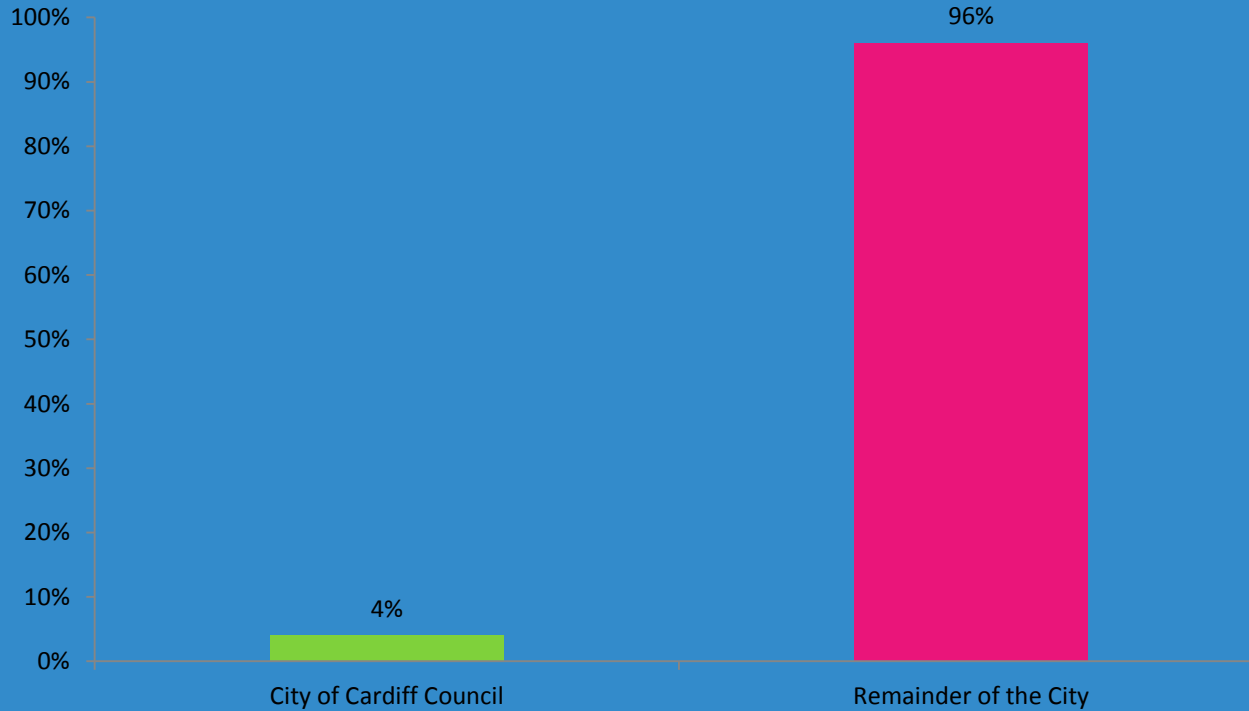
54,809 tCO₂



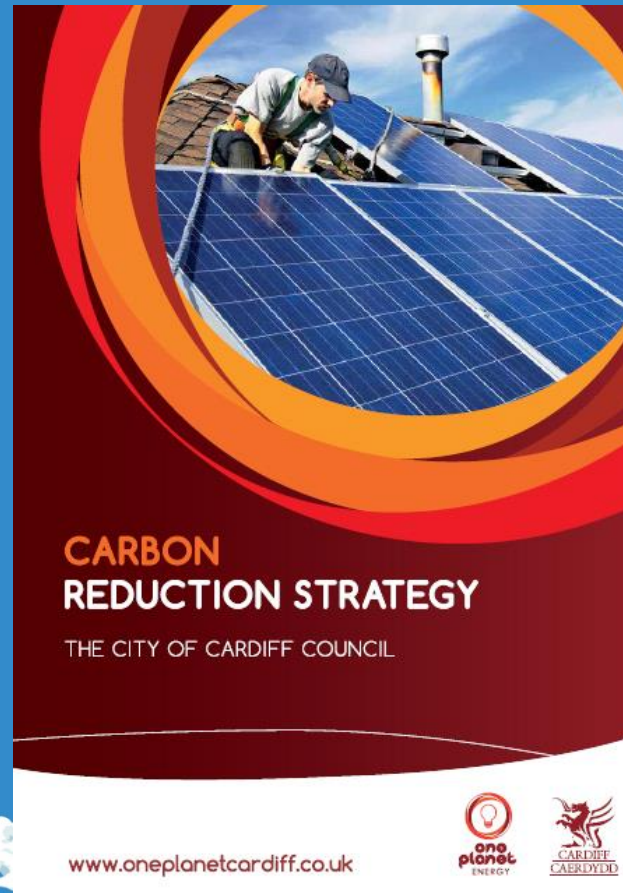
How Much of the City of Cardiff's Electricity is Consumed By the City of Cardiff Council?



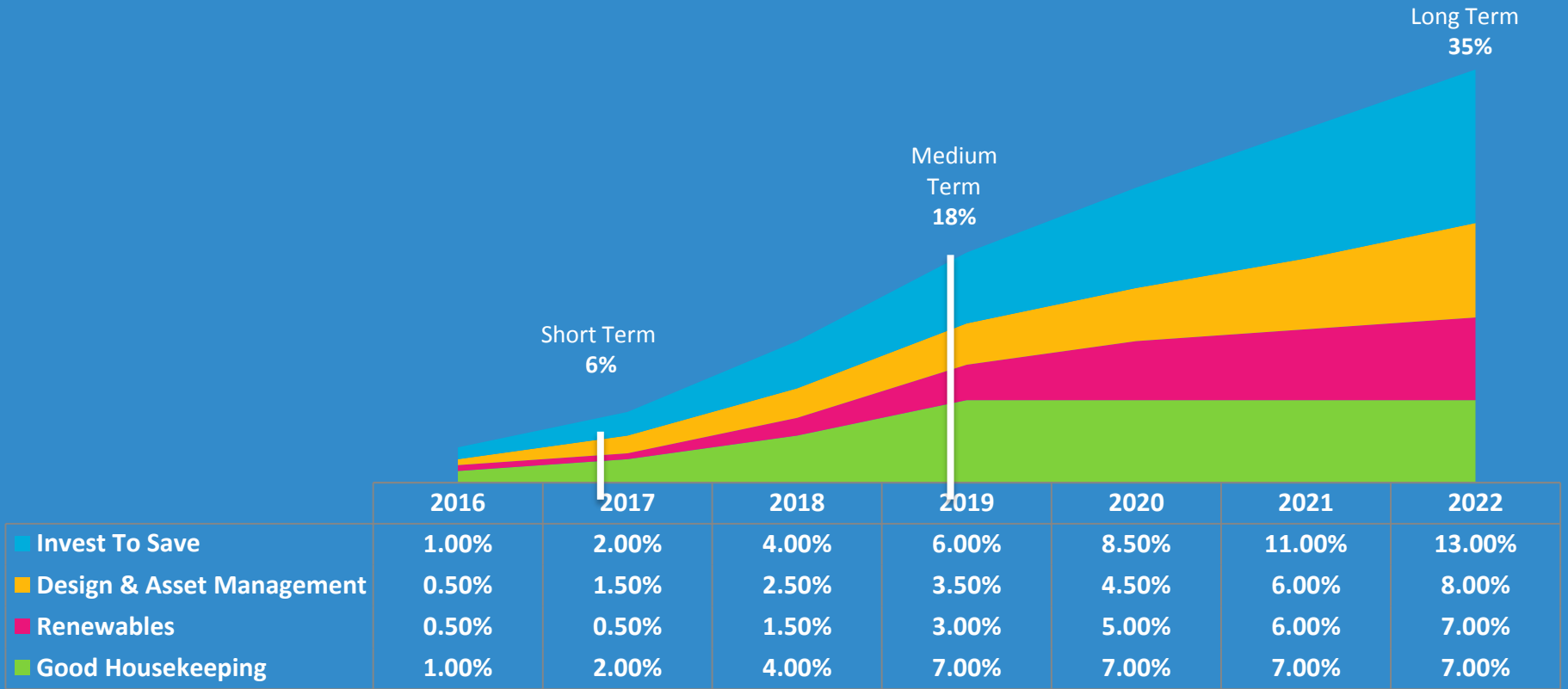
Electricity Consumption



Carbon Reduction Strategy



Carbon Reduction Strategy

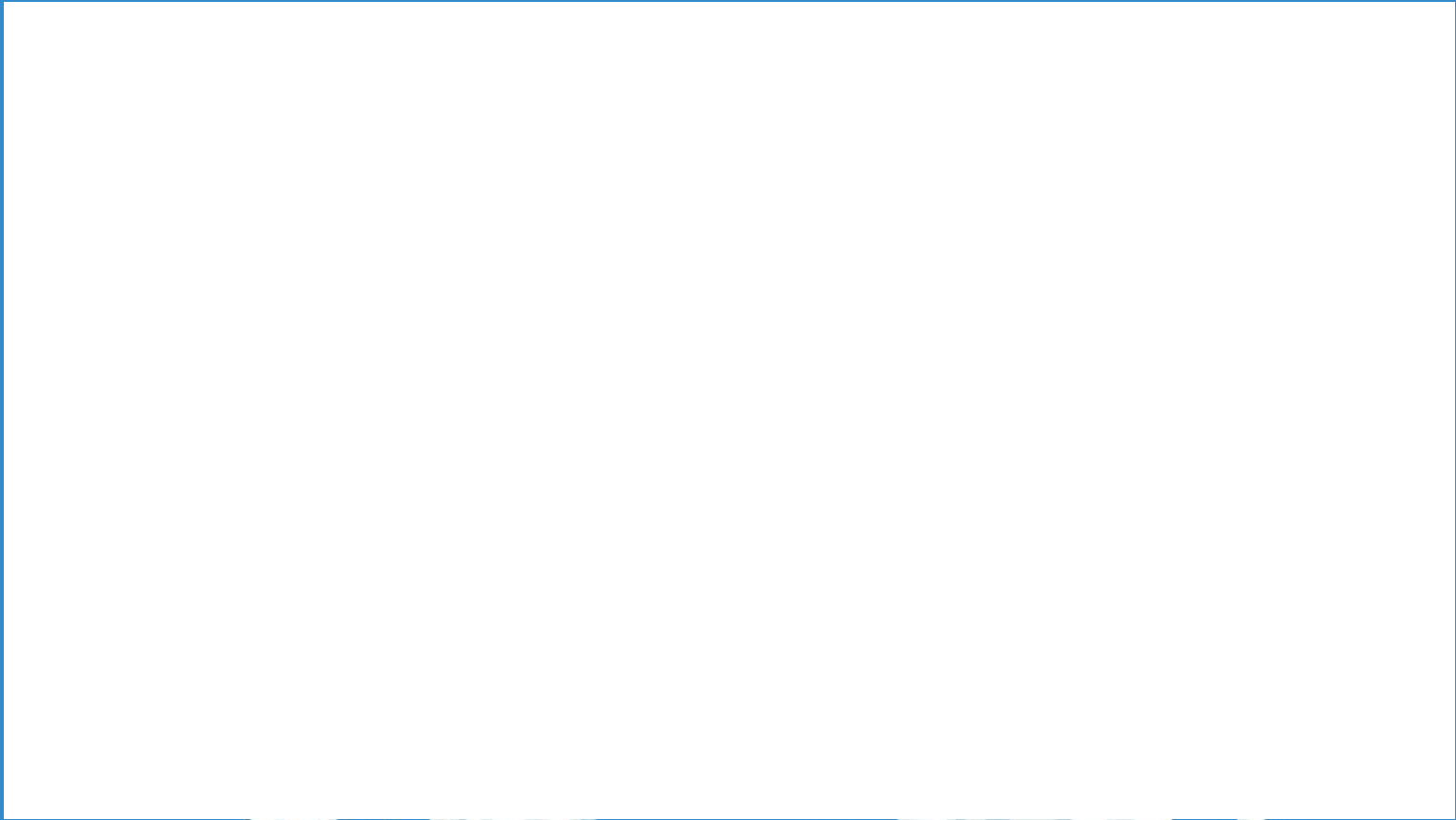


Why Did We Choose Hydro?

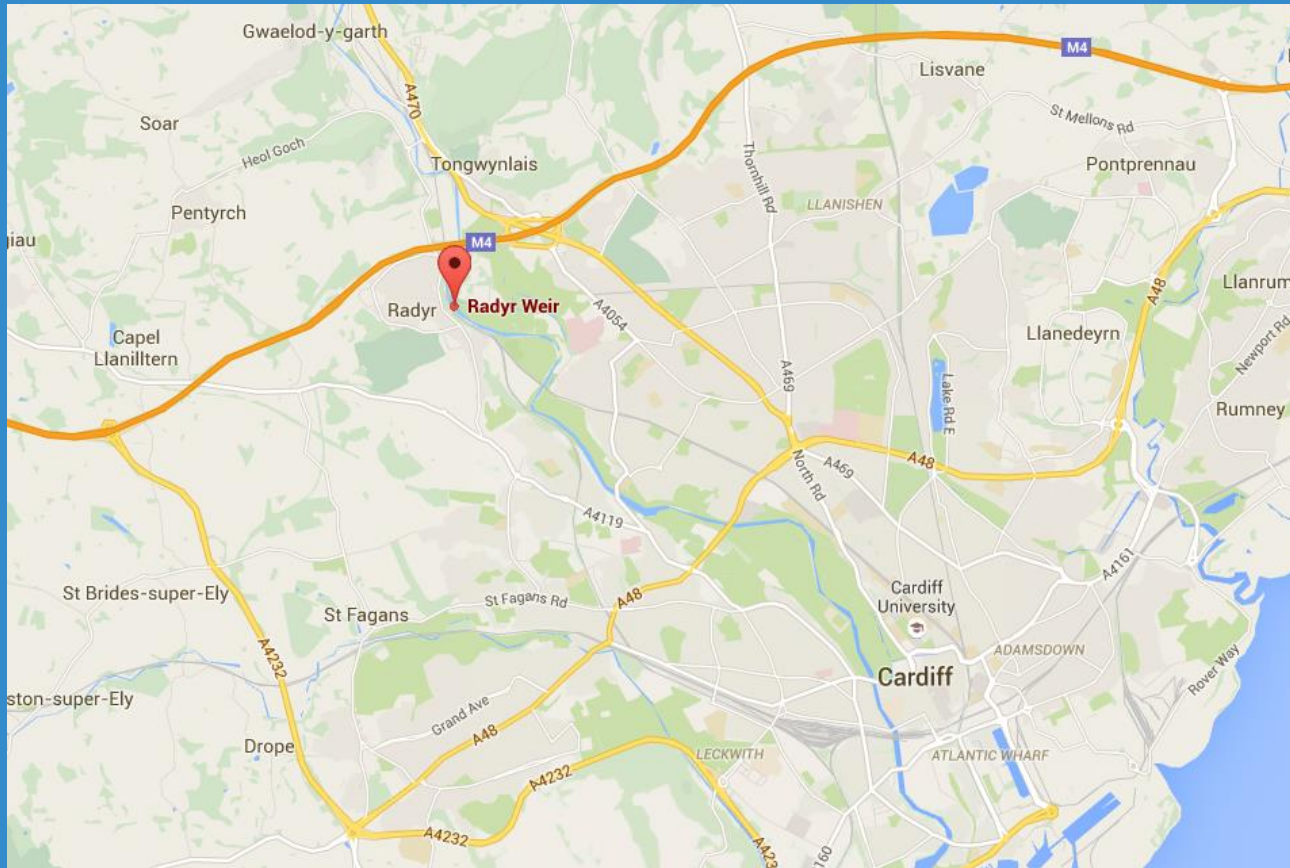
1. Strong financial case - Feed in Tariff relatively attractive
2. Reasonably constant supply of energy – daily / seasonal
3. Low maintenance requirements
4. Fish passes require improvement NRW drive
5. We love a challenge!!!



Radyr Weir



Radyr Weir - Location



Radyr Weir - Location



Radyr Weir - History

- Radyr Weir was built in 1774 to divert water into a leat to the Melingriffith Tin Plate Works
- It was the largest tin-plate works in the world by the end of the 18th century
- The tin mills were powered exclusively by water drawn from the River Taff at Radyr weir



About Radyr Weir Hydro

- 2x Archimedes Screw turbines
- 391kW capacity
- 1.6GWh annual energy generation
- Circa £5m net income over 20 year
- Currently have a PPA with Good Energy (Piclo)



Summary of Pre-Construction Stages

1. **Feasibility** – Financial, technical, headline figures
2. **Approval** - Cabinet Approval, funding etc
3. **Planning**
 - **Planning and Consultation**
 - **Licensing** – Natural Resources Wales (EA)
 - **Grid Connection** – How close is the grid to the site
 - **Feed in Tariff Accreditation** – Lock in tariff 2 years
4. **Procurement**



Barriers / Considerations



Organisational Culture

Misalignment of Drivers – Process v Output. Dimension of time not as important to some department

Risk Aversion – New project type

Expertise – In house?

Bureaucracy

- Board Approvals
- Cabinet Reports
- Officer Decision Reports



Financial

- **What makes a good investment** - Is there a hurdle rate for investment? Political element can sometimes make this unclear.
- **Correct Presentation Format** - Understanding what is the right format for decision- Risk free scenario analysis
- **Funding** – Public Works Loan Board (PWLB), is there spare internal capital / reserves?
- **Assumptions**– Difficult to predict performance, 20 year average

Suggestions

- Need to be well versed in financial analysis to convince those that this is a worthwhile investment
- Gain early understanding of requirements to make decision



Procurement and Legal

- **Route** - Using a framework or OJEU route?
- **Turnkey** - Are you going to procure a turnkey solution or order the screw separately? 6 month lead in time
- **Evaluation** - How are you going to evaluate your bidders' Performance?
- **Contract Type** - What type of contract are you going to use? NEC, JCT
- **Risk** - Where are you going to apportion risk – impact on cost, performance
- **Contractual Mechanisms** - Break clauses, delay damages, performance guarantees etc



Lessons Learnt

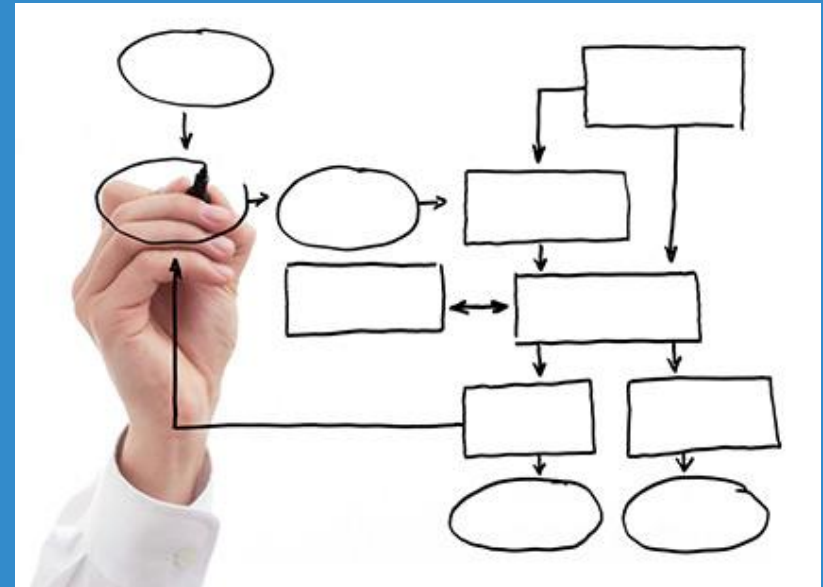


ENERGY MANAGEMENT



Lessons Learnt - Planning

- Multidisciplinary Consultancy Support
- Clarify internal roles at outset
- Early confirmation of grid connection cost and any specific limitations
- Early communication – Environment Agency, Friends Groups
- Consider screw lead time



Lessons Learnt – Site Specific Information

- Ground conditions
- Land Ownership
- Utility Searches
- Maintenance / on going revenue costs

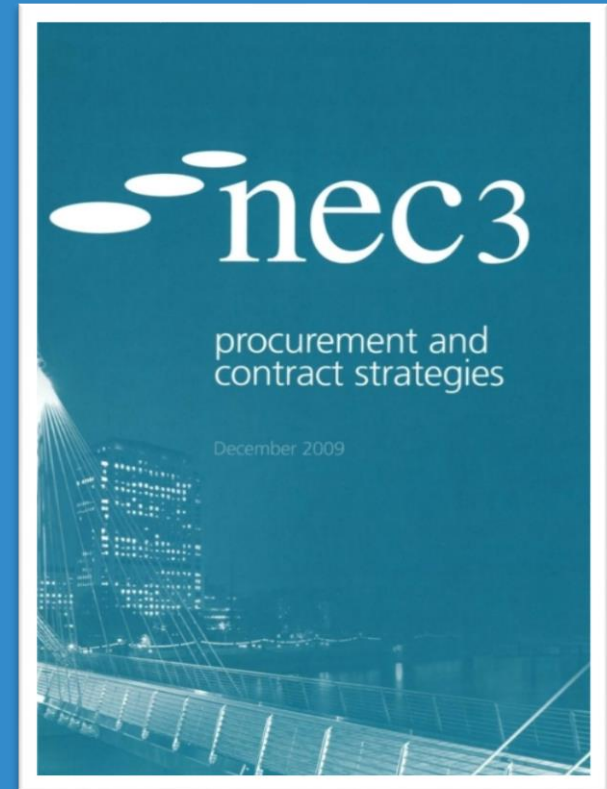


Lessons Learnt – Site Specific Information



Lessons Learnt – Contractual

- Talk to the market
- Use a framework if possible
- Make the opportunity attractive to the market
- Design and Build?
- Project Manager Support



Lessons Learnt – General

- **Senior management champion** – Wade through the bureaucracy
- **Communication throughout project** – Public, residents, local members
- **Influence** - Don't underestimate the influence you have on people
- **Persistence beats resistance**

