

Radyr Weir Hydro Scheme



27th of May, 2015

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ENERGY MANAGEMENT

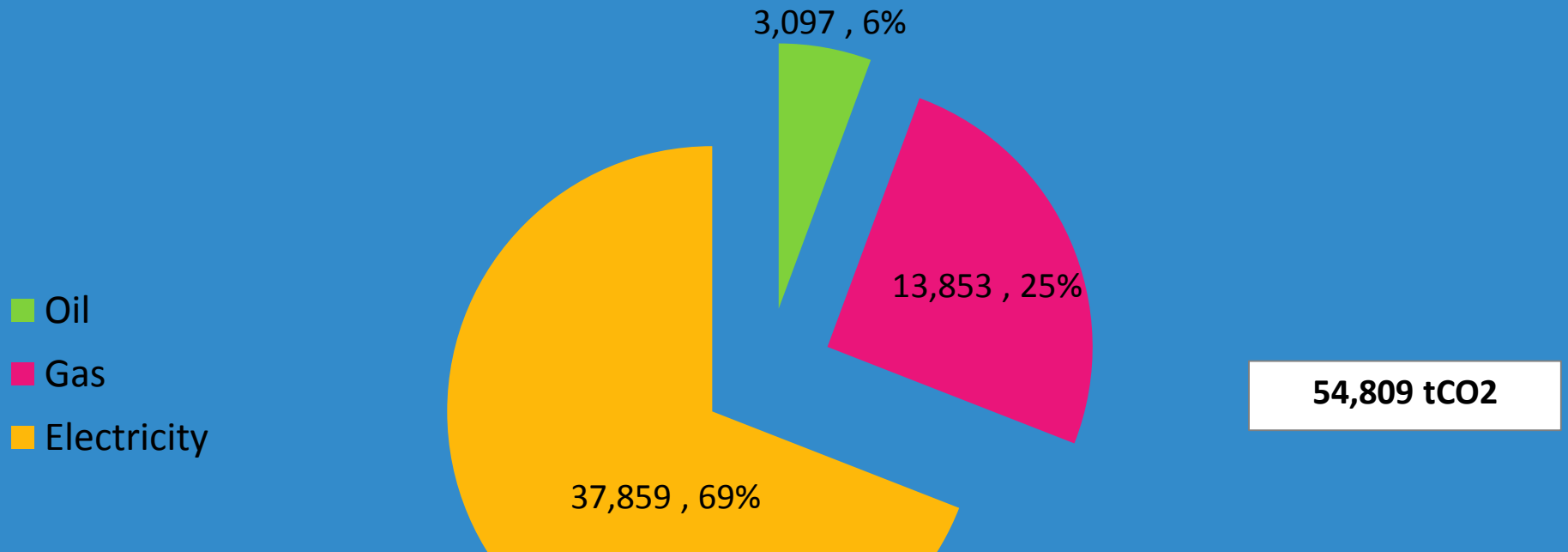


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Our Carbon Impact (tCO₂/year)

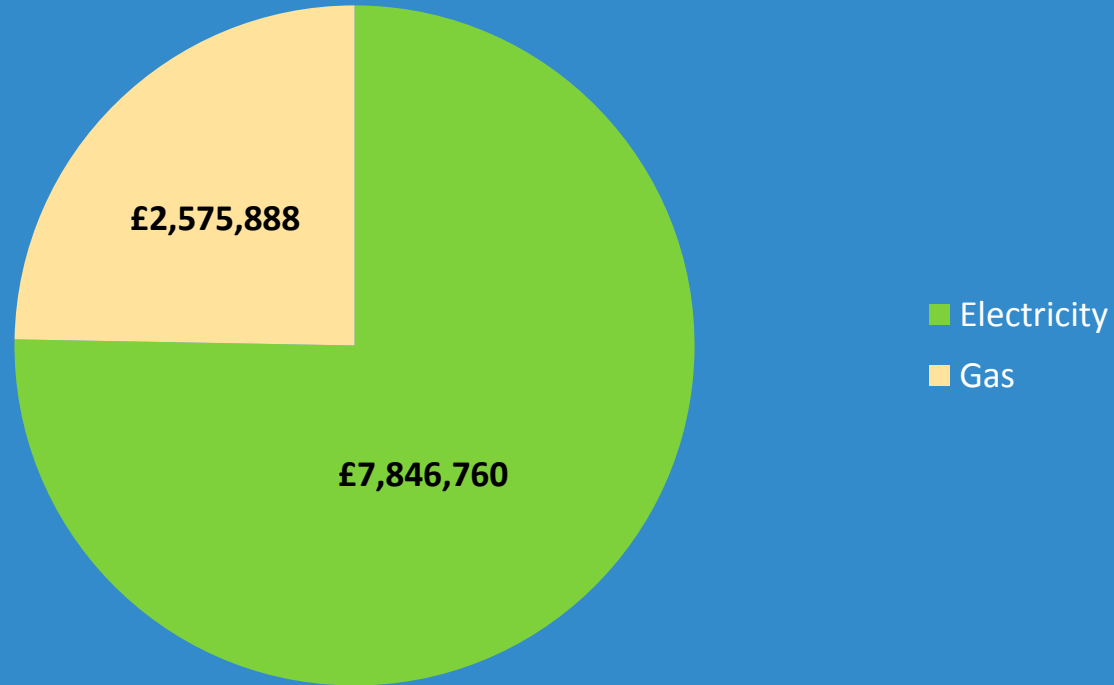


- Oil
- Gas
- Electricity

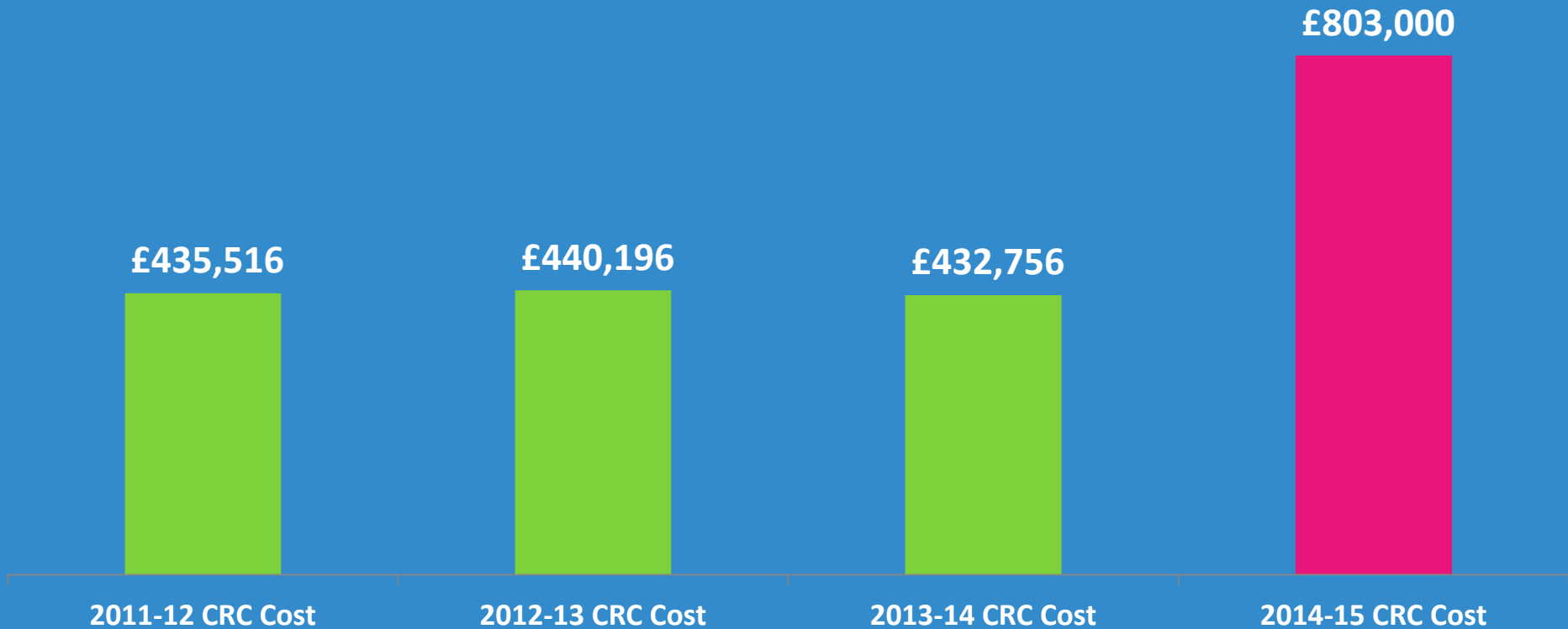


Annual Energy Spend

£10.4m
Annual Spend



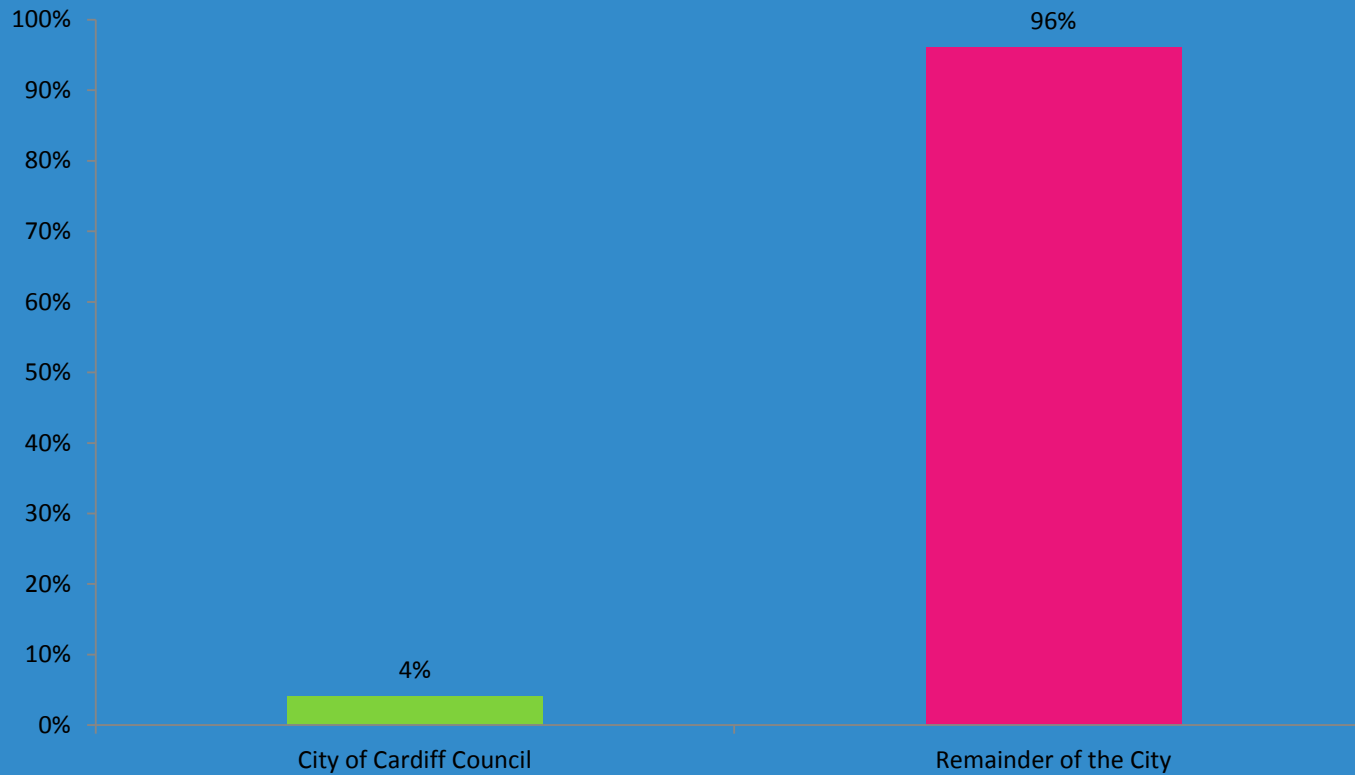
Carbon Reduction Commitment Annual Costs



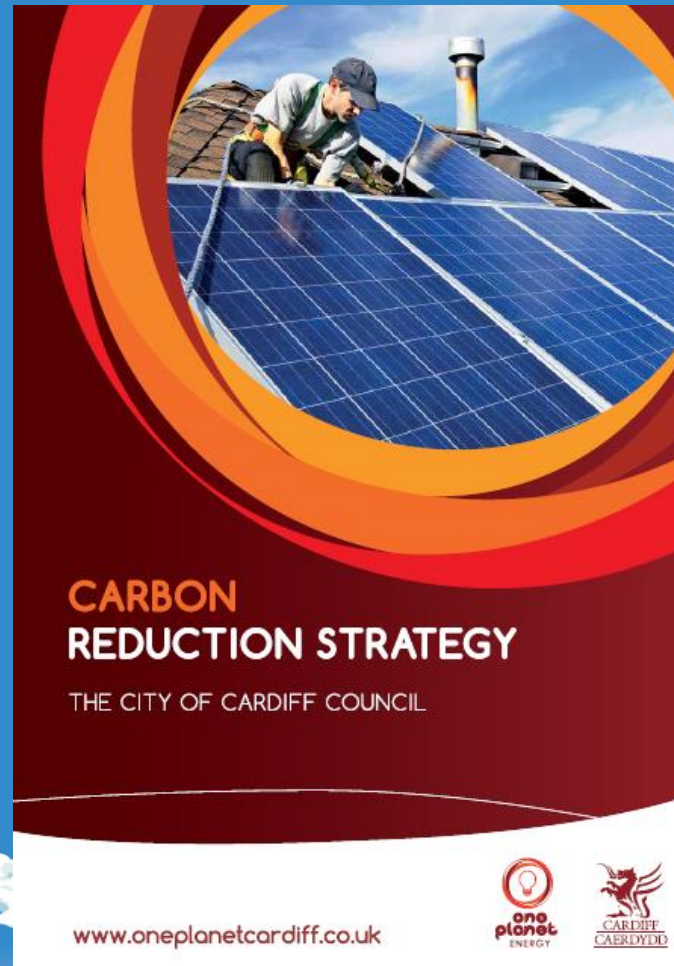
How Much of the City of Cardiff's Electricity is Consumed By the City of Cardiff Council?



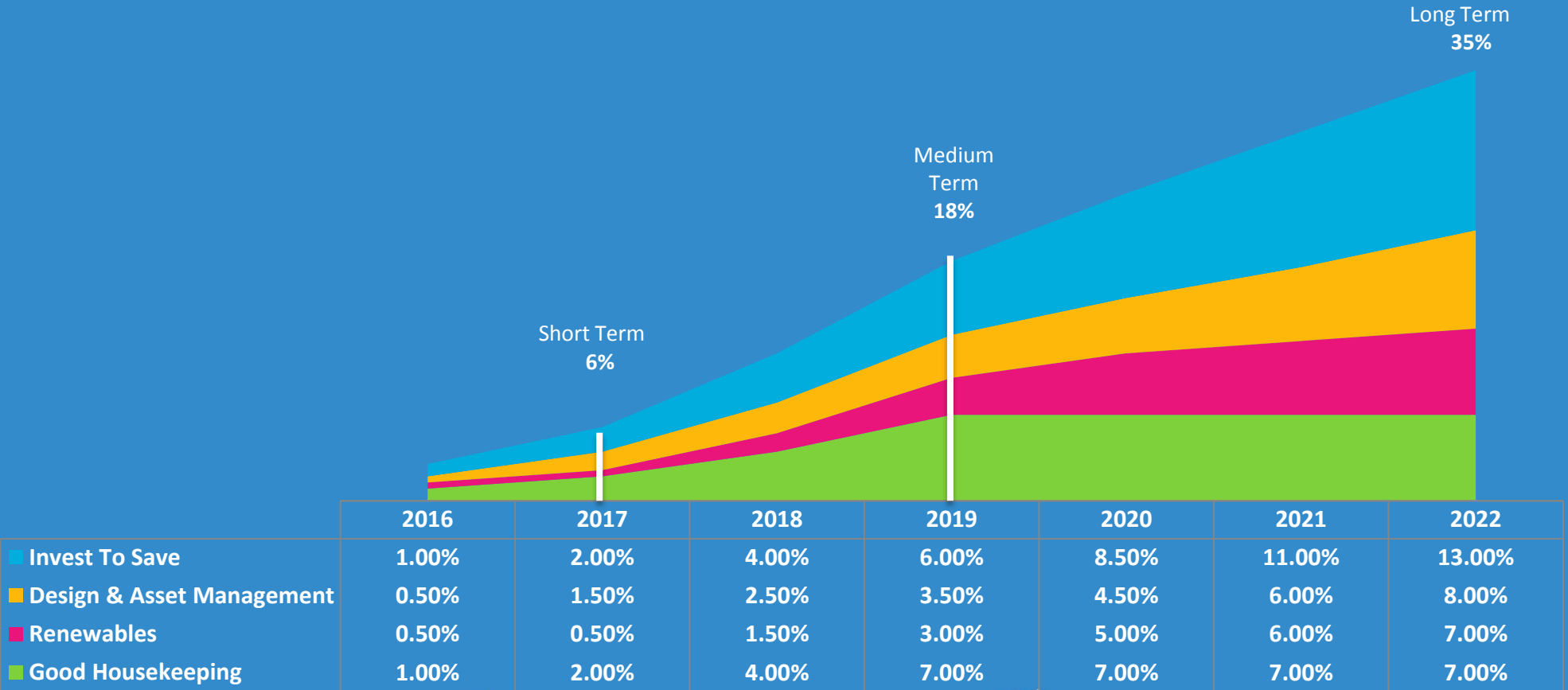
Electricity Consumption



Carbon Reduction Strategy



Carbon Reduction Strategy

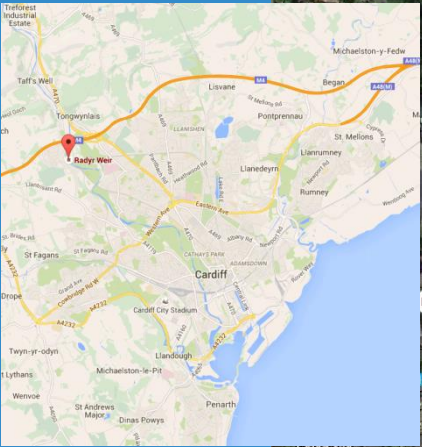
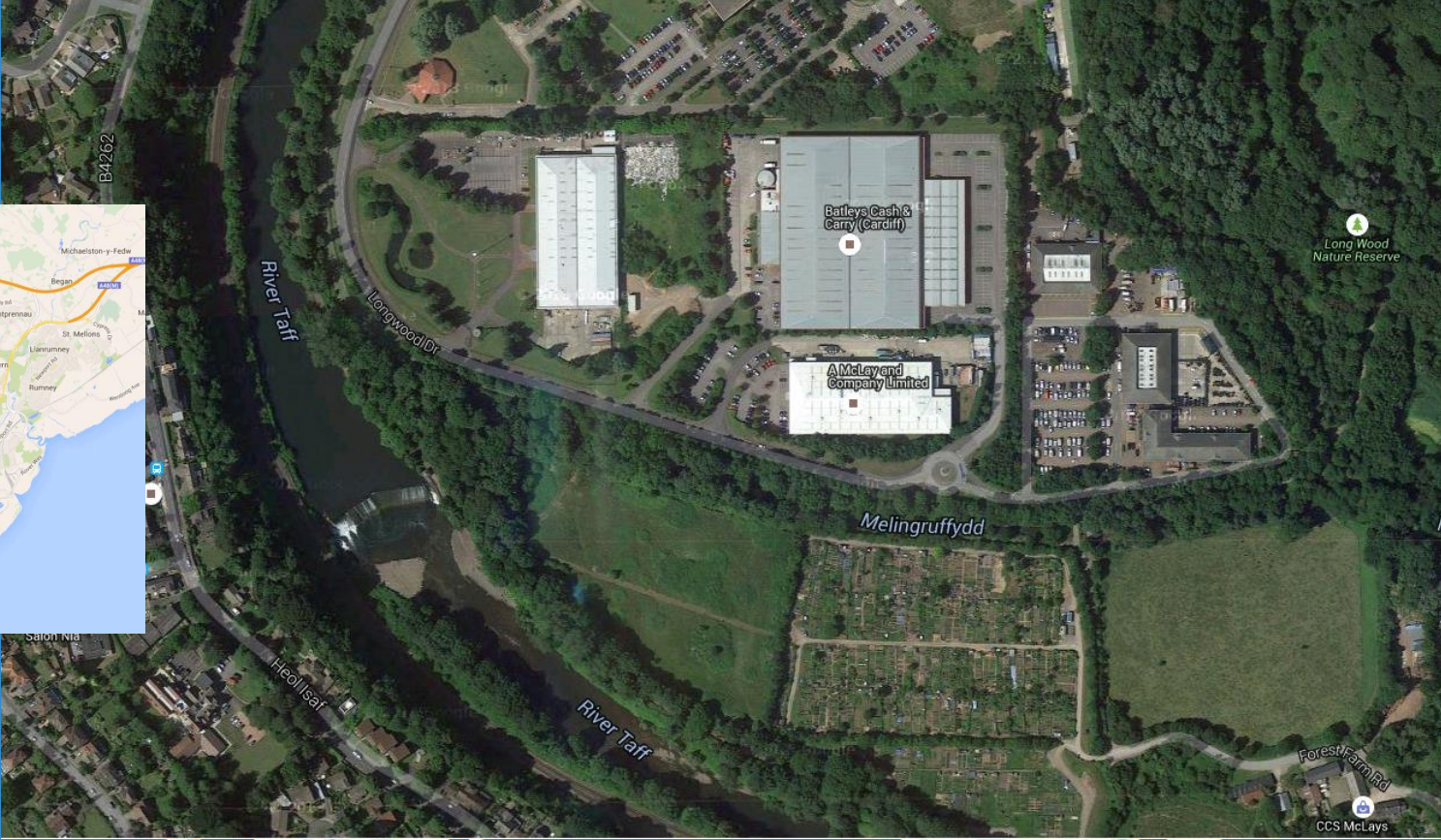


Why Hydro?

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 - Location

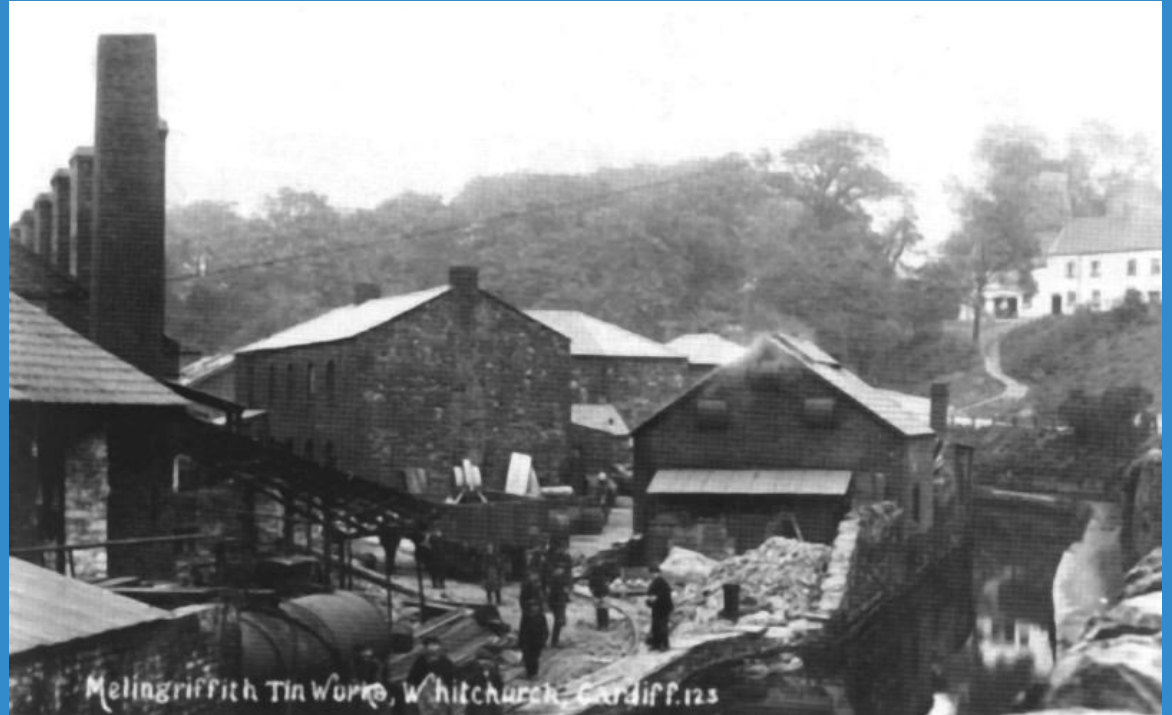


Radyr Weir - Location



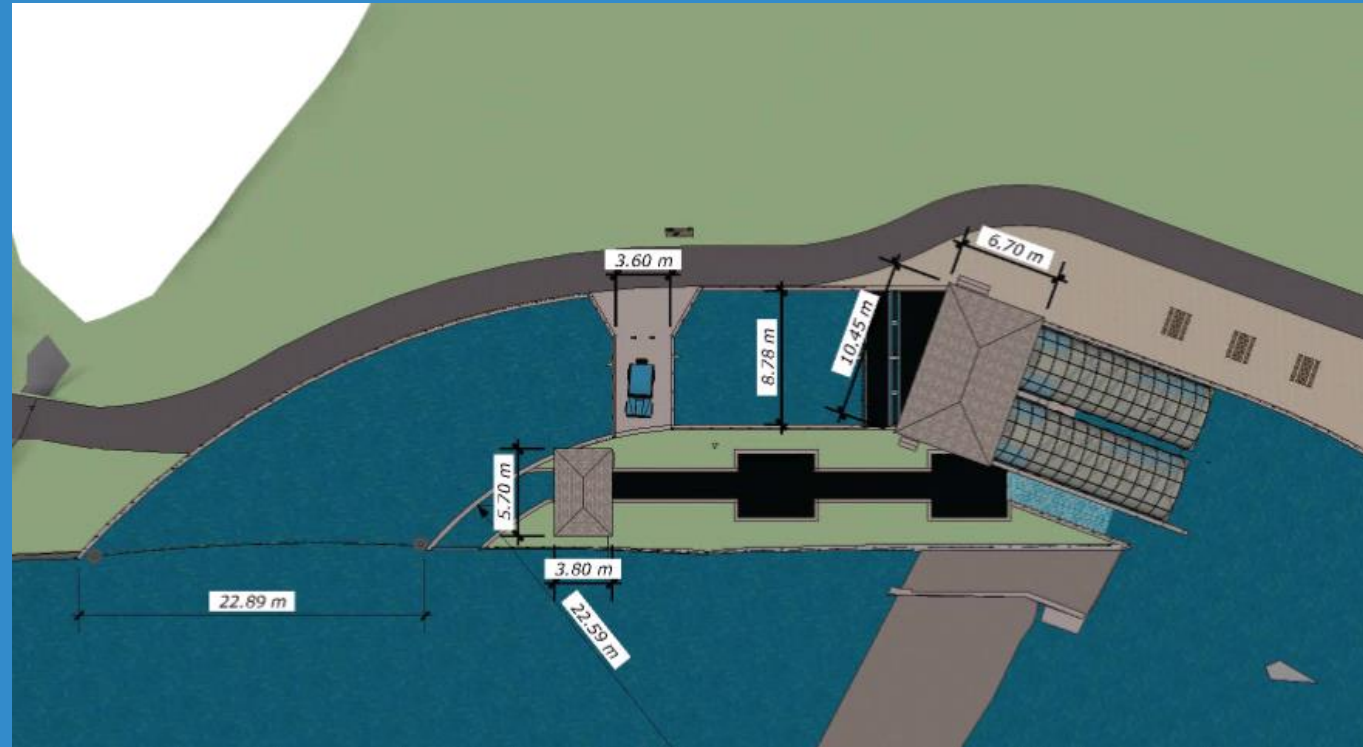
Radyr Weir - History

- 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
- Planning on PPA (retrofit direct wire?)



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

Senior Buy-in – Director, Cabinet/Ward Councillors

Persistence Beats Resistance



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
- **Clauses** - Break clauses, delay damages, performance guarantees etc



General Advice

- Understand all required internal authorisations required
- Early communication with Environment Agency
- Early communication with local groups / anglers
- Early confirmation of grid connection cost and any limitations
- Engage with a multidisciplinary consultant that can deal with all elements of planning and licensing
- Search surrounding Land / Weir Ownership /Utility
- Senior Management champion

