

Mill Site Case Studies in the SE by IT Power

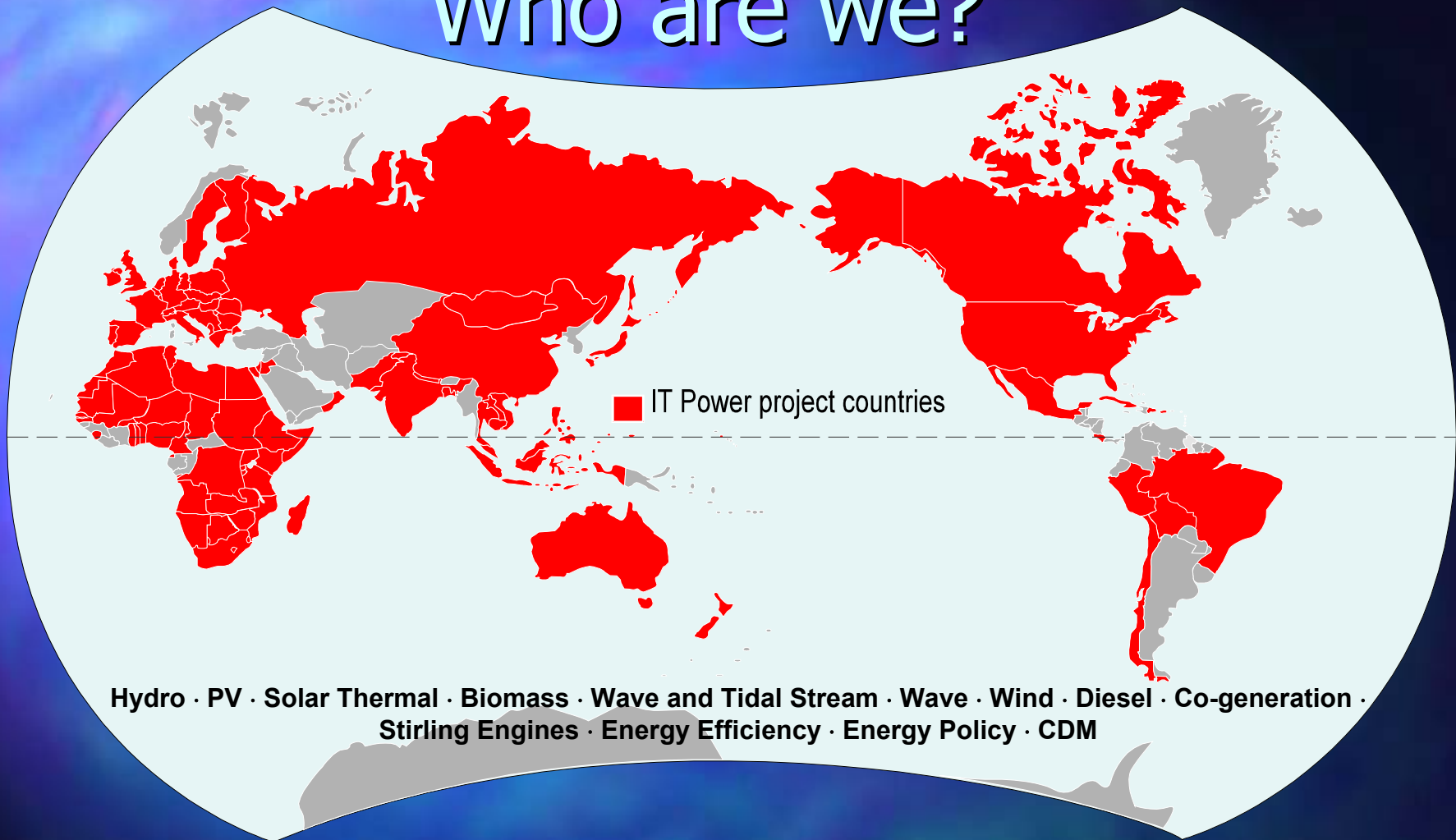
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Power

Hydropower in South East England, 19th May 2004

Who are we?



Established in 1981 with successful completion of over 800 projects
in more than 90 countries



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Two regionally based Case studies of Mill Sites in the SE giving consideration to:

- technical aspects
- administrative requirements
- environmental considerations
- current status

Guildford Mill



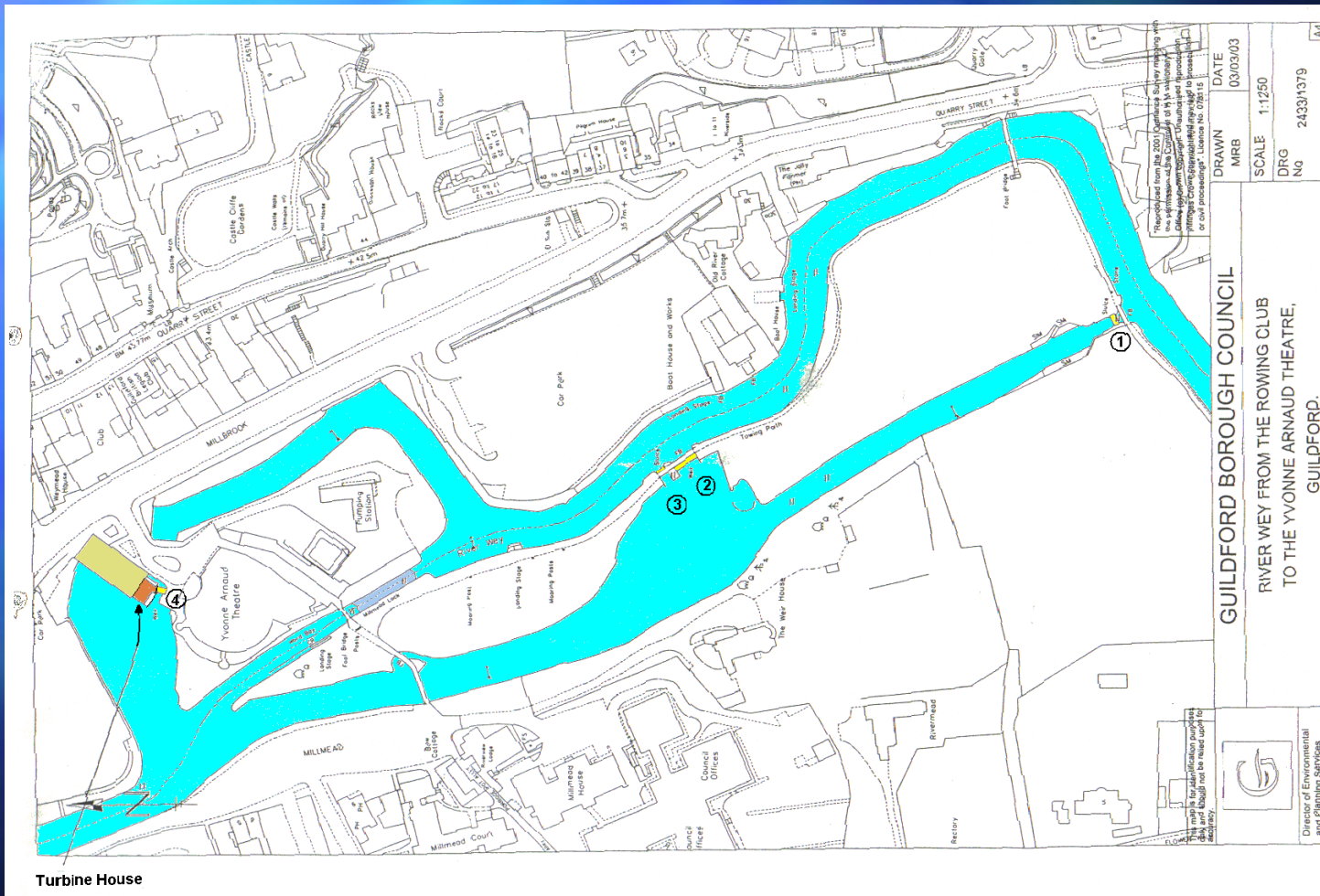
- IT Power commissioned by GBC to undertake a FS.
- Others involved:
 - ECSC
 - DHP
 - Cooper & Withycombe



Original Francis turbine at National Trust offices, Dapdune Wharf

- River Wey
- Current building dates back to 1770
- Turbines installed in 1897
- Upgraded in 1930 and ran until 1952
- Turbine removed in 1990
- Grade 1 listing

Site location





EA Sluices - 1

Boathouse weir and sluices - 2 & 3



Millhouse Sluices - 4

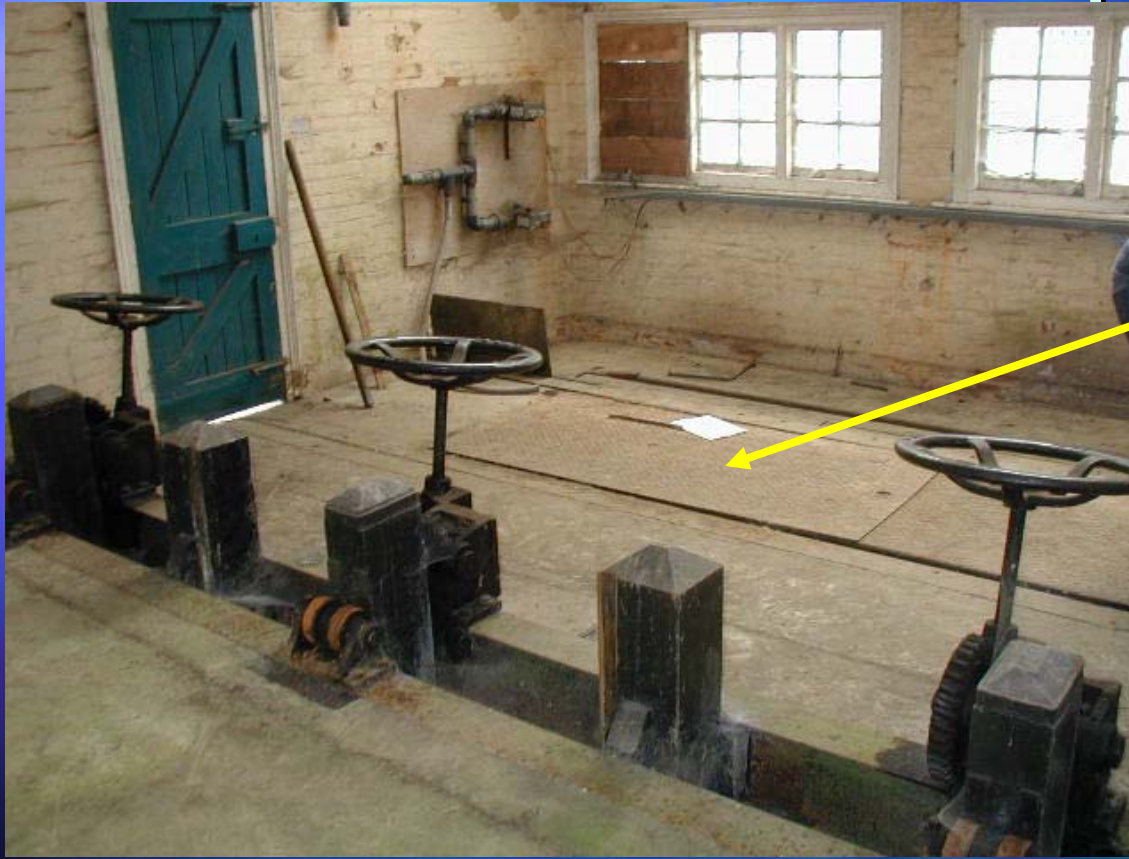
Site Data and Capability

- Design head for the scheme - 1.7m
- Flow exceeded 10% of the time, Q_{10} - 9.65m³/s
- Mean flow exceeded Q_m - 5.66m³/s
- Flow exceeded 50% of the time, Q_{50} - 4.28m³/s
- Flow exceeded 95% of the time, Q_{95} - 2.24m³/s

Rated Power for the turbine is estimated to be 50kW

giving an annual estimated electrical production 265 MWh

Technical aspects



Entrance to old draft tube

Inside the powerhouse

Turbine - old versus new?

- Options available?
 - Reinststate old or similar turbine
 - Install new, more efficient kaplan
- Balance between
 - cost
 - less production
 - civil requirements, reinforcement
 - limitation of existing intake

Administrative requirements

- Consents and Licences that can be needed:
 - Abstraction
 - Impoundment and
 - Land Drainage Consent, LDC

With reinstatement of the old scheme only LDC would be required

Environmental Considerations

EA concerns:

- Weir pool ecology
- Flood defence
- Fisheries
 - fish passage
 - eel passage
 - screening

The scheme would offer:

- Flow year round at the weir and sluices upstream
- Better flow regulation and screening
- Safe passage downstream for both eels and fish

conclusions

- Good site to redevelop technically and economically
- Proactive local authority and good public support
- Reinstatement keeps administrative requirement to minimum
- Good consultation with EA regarding environmental considerations

Current status:

GBC seeking funding with assistance from ECSC

GBC are in consultation with the EA regarding the LDC

Whitchurch Silk Mill



- IT Power are currently undertaking a FS for the Silk Mill.
- Others involved:
 - TVE
 - DHP
 - Hampshire County Council



Original water wheel operates and drives some machinery through a series of shafts, gears and belts.

- On the River Test, area is an SSSI
- Mill site recorded in the Domesday book
- Still produces Silk today
- The 1870's water wheel still drives some of the machinery
- Grade 1 listing



Site characteristics:

- Very low head $<1\text{m}$
- Good year round flow - $Q_{95} \sim 2.9\text{m}^3/\text{s}$
- Scheme of 5 - 10kW possible
- Potential annual production of 40 - 70,000kWh annually
- Silk Mill current consumption is 55,000kWh

Area most suitable for developing a hydro scheme

Key considerations:

- Technical aspects:
 - technology very limited at such low heads
 - best option would require dredging

- Administrative requirements:
 - requires LDC and Abstraction Licence or Impoundment

- Environmental considerations:
 - SSSI - English Nature are statutory consultees
 - Chalk bed river rich in aquatic ecology due to Ranunculus growth
 - Large presence Trout, Grayling and Bullhead fish
 - Dredging, generally not favoured by the Environment Agency

Way forward

- Good discussion with EA and English Nature at this stage - both the EA and EN are generally supportive of the scheme
- Supportive County Council and local council
- High public profile of Whitchurch Silk Mill ensures excellent educational opportunity
- The Whitchurch Silk Mill have the full support of the Hampshire Buildings Preservation Trust.
- **INVOLVE THE KEY ACTORS IN THE PLANNING PROCESS AT THIS STAGE TO AVOID CONFUSION, DELAY AND MISUNDERSTANDING**

Why are we doing this?

- The UKCIP02 Briefing Report produced for DEFRA summarised:
 - *The UK climate will become warmer.*
 - *High summer temperatures will become more frequent, whilst very cold winters will become increasingly rare.*
 - *Winters will become wetter and summers may become drier throughout the UK.*
 - *Relative sea level will continue to rise around most of the UK's shoreline – having greatest effect in the Southeast.*
 - *Extreme sea levels will be experienced more frequently.*
- “The major focus of future energy policy should be to reduce demand, and increase the use of renewable energy and CHP.”
- “Sustainable energy will require more than supply changes in the energy sources of our energy system. It will require a total change in the way the energy system operates, particularly to encourage more efficient use of heat and more decentralised forms of renewable energy.”

extracts taken from 'Limiting Climate Change through Energy Policy: EA Position Statement'

"You must be the change you wish to see in the world." - M. Gandhi

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