

Round up & Summary



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Director Lancaster University Renewable Energy Group & Fluid Machinery Group

Joule Centre Annual Conference 2008

Small Hydro Power Schemes in the North West of England: Overcoming the Barriers.



Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL

Rheged Centre, Thursday 3rd April 2008





Session 1 Introduction









Introduction - Hydro Resource Model

Session 1





Session 1



Renewable Energy Group Assessing Low Head Hydro Availability

- The choice of method strongly influences the answer!
- Local data is best, but...
- hydrological expertise is required for better results





Tracey Haxton Wallingford Hydro Solutions







- Low heads roughly 2 to 35m
- Large range of turbine products available (axial type and radial type)
- Often low speed turbines (approx. 100 to 500 rpm)
- Low speed direct coupled generator > good but expensive
- Gear box can make a project feasible > reduction generator investment
- Fish friendly turbine concepts
- Risks Power loss due to grass or algae
 - Incorrect Design on the intake/drafttube side -
 - High head loss



Dieter Kromholz Andritz VA TECH Hydro







- Heron Corn Mill case study
- Kaplan Turbine Technology
- Grid connection
- Maximise annual usable generated output
- High efficiency and flat curve
- Maximise annual generated revenue
- Minimum pay back period



Phil Leigh (Terry Maguire) New Mills Hydro







Archimedes Screw Turbine Technology





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David Mann Mann Power Consulting Ltd







Where, and how suitable is the 'Grid'?

- Tend to be in awkward locations
- Consider during initial feasibility
- Can be a go/no-go decision maker

Look at: *Distance Voltage Local Loads Single / 3 Phase Switchgear and Ratings Accommodation*



Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL Rachel Hodges TNEI









Bob Rothschild Lancaster University





Session 3 Economic Factors & Financing



The developers view: Heron Corn Mill case study





Centre for Ecology & Hydrology NATURAL ENVIRONMENT RESEARCH COUNCIL Audrey Steeley Heron Corn Mill





Session 3 Economic Factors & Financing



How to raise £250,000

- Our social business model...
- Grants
- Equity (social investors)
- Loan







Session 4 Planning & Public Acceptability



LDNPA

- support small scale and community based hydro schemes
- promote the use of renewable energy sources and new technologies that reduce carbon use
- are developing policy that promotes community-level solutions to reducing carbon emissions
- see hydro schemes as part of this future approach





Centre for Ecology & Hydrology **Richard Leafe** Lake District National Park Authority





Session 4 Planning & **Public Acceptability**





FOUR STAGES ARE CONSIDERED **IN THE BUILDING OF A HYDRO** PROJECT

- **Preliminary studies** 1.
- Scheme development & permissions 2.
- Detail design & tender 3.
- Construction and commissioning 4.



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Bob Parkins R G Parkins and Partners





Session 4 Planning & Public Acceptability



What are appropriate strategies?

Staged & structured approach?

(e.g. other river users)

community benefits

local meetings, consultation,

scoping impacts/potential concerns

key informants and interest groups

Not 'one size fits all'

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Gordon Walker TSEC Lancaster University

local publicity

participation





Session 5 Environmental Concerns



Approach

- Stock at risk
 - Stability
- Deprived reach
 - Characteristics
- Impact of turbine
 - Potential screening

- Wider issues
 - Designation
 - Upstream/downstream
 - Over-abstraction
 - Public acceptability
 - Benefits

Environment Guidelines



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Applicants should expect the Agency to:

- Provide clear guidance on the licensing process
- Highlight key issues for environmental assessment
- Have an understanding of hydropower
- Provide information it has available
- Be consistent
- Provide timely responses, with explanations





ICIL

John Aldrick Environment Agency



















Watch this space!





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There's no such thing as a free lunch...



• Comments through the web-site



