The Potential for Water Generated Power in Derbyshire

Review by Derbyshire County Council - Improvement and Scrutiny Committee – Places

Final Report of the Review Working Group

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The Environment Agency (Mark Bowers)
Severn Trent Water (Martin Dent)

Front cover photograph – Weir on the River Derwent
Photograph on page 20 – Tumbling waters, Monsall Dale

Background to the Review

The review was proposed and agreed by the Improvement and Scrutiny Committee – Places at its meeting on 14 September 2011 (Minute 19/11 refers). The Committee acknowledged that there is a growing desire for using sustainable energy sources to power homes, businesses and other premises. The use of solar and wind generated power has increased over recent years and there is also scope for hydro-electric power generation given certain conditions.

The review aimed to explore the possibilities open to local landowners, businesses and communities to exploit the county's water courses for sustainable electricity generation. The review would call on experts in hydro-electricity generation to explore the benefits and pitfalls which might be encountered and would attempt to ascertain the feasibility of schemes in Derbyshire.

It was anticipated that the main outcome of the review would be the introduction of clear policies by Derbyshire County Council, to encourage the development of projects to harness water powered energy wherever this is feasible.

It was stressed that it was not the intention to encourage the County Council to undertake any water power projects itself, but that the Authority should establish ways in which it could help facilitate the development of water power throughout the county.

A working group was set up to undertake the review with Cllrs. Twigg, Major, Lacey, Wharmby, Atkins and Hosker being appointed from the Committee.

Initial Research

The Concept of Hydro-Power

The Renewable Energy Association (REA) is a membership organisation which represents British Renewable Energy producers and promotes the use of sustainable energy in the UK. It represents a variety of organisations including generators, project developers, fuel and power suppliers, equipment manufacturers and service providers.

The REA defines Hydropower as the product of converting the kinetic energy of flowing water into electricity by a turbine (or similar facility) connected to an electricity generator.

Hydropower can be exploited on various different scales. Large-scale is typically taken to mean more than 20 mega-watts (MW) of grid connected generated capacity and is usually associated with a dam and a storage reservoir. There are many large schemes in Scotland which were built during the 1950s. The potential for identifying new large-scale schemes is now more limited, not only because there are fewer commercially attractive sites available, but also because of environmental constraints.

Schemes of less than 20MW now offer a greater opportunity for providing a reliable, flexible and cost-competitive power source with minimal environmental impacts. These small scale schemes are making an increasing contribution towards new, renewable energy installations in many regions, especially in rural or remote areas. Small scale schemes can be associated with a dam and storage reservoir or can be located in a moving stream of water ("run of river").

Many areas throughout the UK are increasingly considering the development of water power. There have been many studies as to the viability of water power and a raft of guidance is available to potential project developers. In the local area, there is currently a guide to Micro Hydro Power which offers information to potential projects within the Peak Park area. This can be accessed via the Peak Park website.

Gaining Permission for a Scheme

The Environment Agency is a major organisation in the regulation of hydro-power schemes. It has responsibility for overseeing, regulating and licensing water extraction from the nation's water courses and most, if not all, schemes will require input from the Agency.

The Environment Agency has published on its website a step-by-step guide for groups or individuals which is set out below:-

Process to Gain Necessary Permissions for a Water Powered Electricity Plant

Step 1 Find out if Hydro power is suitable for your home or community
Information is available from the Energy Saving Trust website

Step 2 Consult an Approved Installer
A list of approved installers who are members of the Microgeneration Certification Scheme (MCS) is available from the Energy Saving Trust

Step 3 Consult the Environment Agency
The EA will appoint an account manager if required, who will answer questions and have a site visit if necessary. A "Good Practice Guidlelines" checklist is also available from the EA

Step 4 Pre-Application Planning consultations
Seek planning advice from local planning authority and consult the local community and other river users.

Step 5 Grid Connection
Consult local electricity network operator for their requirements for connecting your scheme to the grid

Step 6 Full Applications
Submit full applications to the EA (to include abstraction licence, impoundment licence, flood defence consent and fish pass requirements) and the local planning authority for planning permission

Step 7 Develop the Scheme
Once the permissions have been granted

(source – Environment Agency website 2011)

Planning Permission

As with all developments, hydro-power projects need to satisfy planning regulations and planning permission is required before projects are commenced.

Climate East Midlands is a partnership which brings together a range of organisations for tackling different aspects of climate change. Partners include East Midlands City and County Councils (Derbyshire County Council is a member) Natural England, the Environment Agency and Business in the Community.

The organisation has recently identified a need for the planning process to be streamlined and provide consistency across the region for any individual, group or business which is proposing a hydro-power scheme. To this end, Climate East Midlands has held two seminars for Planning Officers and has produced a draft document entitled **Planning for Hydro-Power: A Good Practice Guide**.

The Guide builds on initial consultation with local planning officers, Environment Agency staff and other stakeholders in the East Midlands region.

National planning policy on renewables (renewable energy) in England is currently set out in Planning Policy Statement 22 (PPS22). This encourages positive planning for renewable energy development and states that small-scale projects can provide a limited but valuable contribution to overall outputs of renewable energy and to meeting energy needs both locally and nationally.

This existing planning policy is due to be replaced by the Government's National Planning Policy Framework (NPPF). This states that planning should:

"secure, consistent with the Government's published objectives, radical reductions in greenhouse gas emissions, through the appropriate location and layout of new development, and active support for energy efficiency improvements to existing

Also relevant to this review is PPS 1 which sets out the overarching planning policies on the delivery of sustainable development through the planning process, and PPS 7 which sets out policies to promote sustainable development in rural areas.

It is intended that the Good Practice Guide will help Planners understand and manage impacts of small-scale hydro-power schemes and create a more joined-up approach to permitting. As well as planning permission, a number of Environment Agency permits are also required. Many of the issues important to both the planning process and Environment Agency applications are similar. It is, therefore, sensible to implement a high degree of consistency in the process and co-operation between both regulators to ensure that duplication is avoided, a consistent approach to determining applications is adopted and that decisions are well informed.

Once adopted, it is anticipated that the Good Practice Guide will provide a useful tool for local planners who must balance the benefits of hydro-power projects with planning regulations and any local opposition.

Benefits and Earning Potential of hydro-power

The environmental benefits of sustainable energy are well documented and widely accepted. In order to meet Carbon Emission Reduction targets, the Government, public sector agencies, businesses and other organisations are actively seeking to use and promote sustainable forms of energy production.

Sustainable energy is most commonly derived from wind, solar or water sources. Windmills and Water Mills have been used for many centuries to fuel industry and other activities. Technological developments have resulted in the emergence of modern versions being developed around the world, as well as the use of solar power for industrial and domestic purposes.

Although the sustainable energy benefits are commonly agreed, the harnessing of sustainable energy is not without its critics, not least on the environmental impact of installations. Some of the most contentious planning appeals recently have been in respect of wind-farm applications, with the visual impact on local landscapes (usually rural) and claims of sound pollution being put forward as major items of concern.

There has also been some criticism of the visual impact of solar panels on domestic properties.

Small scale water-power installations – if undertaken sympathetically and in accordance with planning regulations – are considered to have the least impact on the local area. They are practically noise free (at least when installed where water is already freely running) and the structural requirements can be kept to a minimum with imaginative architecture and planning.

A good example of this is the Haddon Estate facility which is discussed in more detail later in this report. Here, a turbine system was installed on the River Lathkill in the Peak National Park, an area of natural beauty and protected by the Peak Park Planning Authority. By utilising an old mill site and constructing a part-subterranean turbine house, the project had little if no visual or noise level impact on the surrounding area.

In Derbyshire there are already a number of water-power installations, mostly (but not exclusively) along the River Derwent and often sited at disused or converted mills along the river's course. It is a testimony to the un-obtrusiveness of such facilities that many people are unaware of their existence.

A list of known water-generated electricity plants in Derbyshire (proposed or already in existence) is set out below – *(information from the British Hydro Association*)

Name/Location/Operator	**Output (kw)**	**Operational from**
Alport Mill (Haddon Estate)	30kw	2009
Belper Mill (DerwentHydro Ltd)	350kw	1998

Borrowash Mill (DerwentHydro Ltd)	100kw	1995
Burton Mill Hydro Winshill, nr Burton (DerwentHydro Ltd)	70kw	1997
Cauldwells Mill Rowsley, nr Bakewell (Tradelink Solutions Ltd)	15kw	
Torrs Hydro, New Mills (Community project)	63KW	2008
Chatsworth House (Chatsworth House Trust)	100kw	1988
Errwood Reservoir, Longhill Buxton (Hydro Energy Developments)	150kw	1989
Ladybower Dam (Severn Trent)	234kw	2007
Hamlyn Mill (private ownership)	8kw	2006
Masson Mills, Matlock Bath (Mara Securities)	240kw	1995
Milford Mill, nr Belper (DerwentHydro)	185kw	1990
Oldcotes Mill, Derbyshire (private ownership)	3kw	2000
Rhodeswood Reservoir Tintwhistle nr Glossop (SHP Projects Ltd)	250kw	2001
Staunton Harold Reservoir Nr Melbourne (Severn Trent)	300kw	
Torside Reservoir Tintwhistle, Glossop (SHP Projects Ltd)	245kw	2001

Weir Mill Farm Derbyshire (private ownership)	8kw	1990

NB The total kw/hour for these schemes is just over 2300kw – which is enough to power 3000 average homes.

At this point it should be noted that statistics on the number of average homes which could be powered by water generated electricity **do not** imply that homes near a facility will be connected to the plant and receive free power. Whilst this can and does happen – especially with small-scale private operations – it is not a matter of course that local properties will receive all their power free from a nearby hydro-power project. Usually, generated power is sold to the National Grid for re-sale by the major power suppliers. Income is received by the hydro-power project owners from the sale of the power and Government Feed in Tariffs (FITs).

Feed in Tariffs (FITs)

In April 2010 the Government introduced the Feed in Tariff scheme (FIT) under powers in the Energy Act 2008. Through the use of FITs the Department of Energy and Climate Change (DECC) aimed to encourage the deployment of additional small-scale (less than 5MW) low carbon electricity generation, particularly by organisations, businesses, communities and individuals who have not traditionally engaged in the electricity market. This would allow many people to invest in small-scale low carbon electricity, in return for a guaranteed payment for the power they generate and export. FIT income effectively "tops-up" income generated by selling power to the National Grid and shortens pay-back periods for projects which helps encourage capital investment.

At present, income from FITs is calculated as follows:

- **Generated Tariff** of 21p per unit generated for systems producing up to 4KWp and 16.8p per unit for systems producing from 4KWp to 10KWp
- An additional **Export Tariff** of 3.1p per unit is paid for power sold to the National Grid (this is on top of the income from the actual sale of the power units)
- For hydro-power systems already in the FIT progamme this is guaranteed for 25 years from power production

The Government is currently reviewing the FIT programme. It is not yet known if the payment level of FITs will alter but the uncertainty surrounding this income source is likely to have an impact on the earning potential of hydro-power schemes, especially the smaller one and those developed and funded by community groups. Most of these will have developed business plans based on income from FITs as well as sales of generated power. Changes to the FIT programme could have a detrimental effect on the pay-back period and viability of some projects.

Derby City Council – Longbridge Weir Project

The working group was made aware of a project which was being developed by Derby City Council as part of the re-development of the Council House in Derby. This building is ideally placed on the banks of the river Derwent and the Council is installing a water turbine system at the Longbridge weir which would produce power to feed some of the Council House electricity needs in the future.

Some of the working group Members made a visit to Derby on 27 October 2011 to meet with the project manager and contractors who were developing the system. As well as the City Council's Project Manager and Clerk of Works, present at the meeting were engineers from Balfour Beatty, the project contractors, and the project developers, DerwentHydro – a local company based in Duffield, Derbyshire.

The benefits of water power were discussed. Water is the most powerful and efficient natural moving force for generating electricity. When compared against other forms of electricity production, water power tops the list as shown below;

Power Source	*Efficiency (%)*
Water	80%
Gas fired power station	50%
Wind turbine	25%
Solar panels	12%

When other issues such as carbon emissions and impact on local landscapes, are taken into account, water power does provide the most efficiency with least environmental impact.

The Longbridge Weir scheme will cost the City Council £1.7m. However, if the Council did nothing to address its current "carbon footprint", it would have financial penalties imposed on it under the Government's Carbon Reduction Commitment scheme (CRC). As well as reducing these financial penalties, the scheme will also reduce the council's electricity costs and provide additional income through selling excess power to the National Grid.

The scheme will have a generating capacity of 230KW and generate 1.2million units per year (enough to power 300 average homes).

Income (around £138,000 per year) would be available thought the FIT scheme, with an additional £60,000 anticipated from the sale of electricity to the local grid network.

Given these financial incentives, it had been estimated that the "break even" point, at which the scheme will have paid for itself would be 25 years. However, due to the current trend in price rises of all fuels, including electricity, this time period is expected to reduce.

The project managers gave outline details of the scheme, which saw the establishment of a turbine system on one side of the river, adjacent to the River Gardens and “River Lights” development. The system will exploit the fall of water at the weir, a drop of 2.7 metres, and will incorporate a channel, to allow safe passage for fish and a trap and raking system to automatically collect and remove rubbish and debris such as tree branches and other obstacles which might block or damage the system.

The Derby turbine scheme is located on what is considered a “greenfield site” being a new-build development on the banks of the Derwent adjacent to public open space. However, the final structure will not be obtrusive and the surrounding area would be landscaped by the contractors in accordance with the project manager’s brief. It was also noted that, in many locations, new turbine systems could be constructed on sites that had previously been used for industrial purposes (a typical example being old water powered mills which are abundant in Derbyshire). The City Council, in partnership with the project developers, was investigating the possibility of other turbine systems being installed at more locations along the Derwent.

In common with similar projects, the Derby scheme has had to pass through a rigorous consultation and permission obtaining process, including planning consent and permission from the Environment Agency.

An important factor for the Environment Agency was any impact a scheme may have on flooding levels. The project consultants were required to provide models and calculations to assure the EA that there would be no additional flooding hazard as a result of the turbine scheme.

It was noted that, whilst these consultations and permissions were vital. the process, more often than not, added weeks onto the time it took to develop and build a project, and the engineering and project managers often found the process elaborate and frustrating with some agencies often contradicting each other.

Larger projects could employ expert consultants to navigate these processes (at a cost) although smaller schemes could be hampered by the bureaucratic process to the extent that they might not proceed to fruition. There was a consensus amongst the contractors and project managers that, in order to facilitate the development of more hydro-powered schemes, especially small-scale ones, a streamlined approvals process should be established by those agencies involved.

The working group Members were impressed with the scheme and the forward thinking approach of the City Council. Whilst accepting that the City Council was well placed to develop the scheme, both geographically – being in close proximity to the river and weir - and timely – being in the process of re-developing the Council House, it was agreed that there was great potential in Derbyshire for similar projects.

It was particularly noted that, for an organisation to benefit from a hydro-power system, its premises did not have to be situated near a river or other water source. As long as there was reasonable access to an electricity sub-station, a hydro-powered system could “stand-alone” along a suitable water source and feed electricity into the National Grid.

Haddon Estate – Alport Mill Project

Following the review working group's initial visit to the hydro-power scheme being constructed by Derby City Council, the Members sought to visit a much smaller project to ascertain the experiences of organisations or individuals who develop small hydro-power projects.

In December, the working group visited the Alport Mill project on the river Lathkill at Alport village, south of Bakewell. The project is owned by the Haddon Estate and was commissioned in June 2009. The group met the Estate's river keeper who had been involved in the project since its early stages and who currently oversees the management and maintenance of the system.

A turbine was installed at the historic mill site and the scheme included

- a new intake system to draw water from the mill pond and feed it into a supply pipe
- a self cleansing "trash rack" which keeps both debris and fish from entering the pipeline
- 36m of buried pipe running along the edge of the mill building to bring water to the turbine
- A low profile (mostly below ground) powerhouse building which houses the turbine, belt-drive, generator and control panel
- An exit channel which discharges the turbine flow back into the original watermill tailrace channel
- A buried electrical cable which connects into the existing mill switchboard so that the turbine can supply the local village network.

The system manager gave his candid opinion of how the project had performed. Initially he had been very enthusiastic about the project – which had an anticipated capacity of generating up to 30kw of power, enough to power around 70% of the village of Alport.

The planning consents and permissions from the Environment Agency were not difficult to obtain and staff from both the Environment Agency and the Peak Park Planning Authority were helpful in this respect. There had been, therefore, no particular problems in planning and constructing the system.

However, the working group was informed that the project as a whole had not been as successful as anticipated. The river Lathkill, like most rivers, is subject to seasonal depth and flow levels. During 2011 the flow of water had become insufficient to operate the turbine in April and on the day of the site visit (1 December) the turbine had produced no power since that time.

Although the river flow did drop each summer, in this particular year it was taking much longer to return to the level which would allow the turbine to operate. This had effectively rendered the turbine inoperable for 9 months so far and had drastically reduced the efficiency of the system and its estimated "pay-back" period.

The situation was worsened by the fact that, for every day of “down-time”, the system still had to be maintained and this included the operation of the self-cleansing ”trash rack” which had to actually use electricity from the national grid to function, thereby creating an additional cost.

It was proving to be unlikely that the turbine system would generate enough electricity and Feed in Tariff (FIT) income to cover the costs of installation and it was unlikely that another such scheme would be considered by the Estate.

In addition, the turbine system, whilst not harmful to fish itself, did temporarily divert water from a section of river which had subsequently seen a migration of fish to alternative sections of the river. This had resulted in the estate losing income from a number of fishing licenses on that particular stretch of river.

Of course, 2011 may prove to be particularly unusual for low river levels but it highlights the need to take these possible circumstances into account whenever future schemes are proposed.

The working group members found the visit very useful in establishing the pitfalls which could be encountered by smaller projects. It is apparent that the financial costs of establishing some smaller water power schemes can considerably outweigh the income received. It was agreed that these issues should be taken into account when considering the widespread promotion of water power throughout Derbyshire.

The working group members were pleased to learn that planning permission and other consents had not been difficult to obtain, as this was an issue which had been raised at the earlier site visit in Derby.

Calver Mill Project

The Calver Mill project is in its infancy compared to the two other projects visited by the review working group. Members were invited to meet with the project developers, who were residents of the Calver Mill complex, in April this year. Cllr John Allsop, Cabinet Member for Technology and Recycling, had expressed an interest in this project and also attended the meeting.

As its name suggests, Calver Mill is a former mill on the banks of the Derwent at Calver village, north of Baslow. The complex has been converted to provide over 40 apartments and cottages which currently provide homes for permanent residents and holiday accomodation. Some of the residents have formed a group to investigate the potential of harnessing the waterpower which still courses through the former mill wheelhouse.

In 2009, the residents' group commissioned a study by a post-graduate student to measure the viability of the proposed project. The survey reported that:

- The current flow at the wheelhouse was 0.76 cubic metres per second
- The current power availability was 52kw
- Upstream improvements could improve power output to 90kw
- Annual output was estimated at 300,000 to 400,000kw per hour
- Capital (including feasibility/design studies) costs were estimated at £240,000

The group has further developed the proposals and has determined that:

- Water would continue to flow from the existing mill goit and run through the wheelhouse, as at present.
- The mechanism to harness the water power should be industrial wheels
- Generated power would be sold to the National Grid and would also attract Feed in Tariff (FIT) income
- Possible use of some of the generated power for the public areas of the complex
- Possible use of power for residential properties on the complex

During the meeting with the residents' group representatives, the working group Members had a tour of the mill complex and the wheelhouse. A powerful course of water still pours through the structure and gave a very good impression of the potential for harnessing the power.

The wheelhouse building itself had been renovated (it currently houses the communal gym) and would only require technical adaptations to facilitate a new water wheel and associated equipment.

The original mill goit (feed in channel) still operates to provide the flow into the wheelhouse as it has for centuries. It was not anticipated that the project would detract from the river flow or create environmental changes to the locality. The intended use of water wheels for the scheme would be a sympathetic revival of the

wheelhouse's original use and would sit well with the renovation and continued use of the original mill buildings.

The disadvantages currently being experienced by the group were:

- Locating companies with industrial waterwheel expertise
- Hydro-power consultants had not been interested in a waterwheel scheme, preferring other methods of harnessing the power (such as turbines or archimedes screws) with which they had expertise
- Identifying contacts in the regulating authorities such as the Environment Agency
- Advice on how to constitute their organisation
- Finding investment for the scheme
- Encouraging investment from the complex residents (some residents were unable to afford a contribution, some were uninterested – particularly those whose properties were for holiday or temporary use)
- Uncertainty about changes to the FIT scheme

During the meeting with the project group, Members offered to supply the residents with contact details for organisations such as Groundwork Derbyshire, the National Lottery Fund and the Environment Agency, as well as another small hydro-power project with which s Member had connections. This would help the group to establish links with groups and organisations who could hopefully address some of the Calver Mill issues.

It was noted, however, that the problems of finding support and contact with organisations which could help advance new projects needed to be addressed. The Calver Mill project group would welcome a "one-stop-shop" type of facility, where information and support could be obtained from a number of agencies but through one contact point.

At the end of the visit, working group Members agreed that, although the Scrutiny review of water generated power would soon be reaching a conclusion, it would be of interest to follow the progress of the Calver Mill project to ascertain the problems it may encounter and the ways in which these are addressed.

Water Power and the Environment Agency

The Environment Agency (EA) is probably the major organisation which will regulate the development of a hydro-power scheme. Local planning authorities have a statutory obligation to consult the Environment Agency on hydro-power planning applications and the EA is also a statutory consultee on Environmental Impact Assessments (where these are required). It is also recommended that discussions are held with the EA at the pre-application stage. This would help establish:

- The suitability of the proposed site for hydro-power in the context of the catchment as a whole
- Likely information required to support an application including the scope of the Environmental Statement (if required) or supporting environmental information
- Potential issues (material planning considerations) and agreement as to which regulator will take the lead on specific issues
- The likely potential significant environmental effects
- Design elements that might be required (eg. fish passes and screens) and the planning impacts of these (eg. visual appearance)

Before the development of a hydro-power scheme can begin, permits and consents have to be obtained from the EA.

A **Water Abstraction Licence** is required for each project. These can be either a Transfer Licence, a Temporary Licence (authorises abstraction for a maximum of 28 days and is not relevant to hydro-power schemes) or a Full Licence (authorises water to be taken for a "use" and is chargeable). Most hydro-power schemes will require a Transfer Licence where water is transferred from source to another area without intervening use. This allows the diversion of water through a "leat", "goit" or similar and returning the water to the main watercourse once it has passed through the power generation mechanism (eg. wheel, turbine or screw system). There is no annual abstraction charge for these licences.

In order to discuss the Environment Agency's involvement in hydro-power development, the review working group met with Mark Bowers, the Environment Agency's Planning and Corporate Services Manager (West Area) 16 March 2012.

The EA was very supportive of hydro-power schemes, in the right location. The determination of a suitable location depends on a number of issues not least the impact on flood defence and land drainage. The protection of the local natural environment is also an important factor and, very often, the requirement for fish passes and/or fish screens will be a condition of an abstraction licence. The EA often also requires that environmental impact assessments are undertaken on behalf of the project managers for submission with any application.

It was accepted by the EA that, in the past there had been duplication and/or conflicting advice or decisions made by different factions of the Agency. This was understandable given the Agency's multiple responsibilities, including protecting the local living environment and maintaining flood defences, whilst at the same time encouraging sustainable and renewable energy creation.

It was noted, however, that the EA had done a lot of work to encourage the development of hydro-power schemes by simplifying the application process and helping to guide projects from their early stages. An important element to this support is the allocation of an “account manager” to each scheme from the EA. Whilst this officer will not take a full lead on a project, they will be the link officer and main contact point with any issues pertaining to the EA’s involvement in a project.

The EA also had Policy Officers working with Climate East Midlands which was forming links with Planning Officers. This should also help streamline and simplify the permissions process and enable examples of best practice to be passed onto other project developers.

The EA often had to act as a “brake” on some projects. It was understandable that hydro-power project developers were enthusiastic about their proposals and sometimes it was easy for them to overlook potential stumbling blocks or pitfalls linked with their project.

There were also occasions where some project consultants (employed by project developers to ascertain the feasibility of a proposed scheme) over-estimated the potential of hydro-power projects, whether in relation to outputs, earning power or both. It was stressed that this was not always the case but the EA sought to advise all project developers to seek evidence of findings when consultants undertook feasibility studies. Over-estimation of a hydro-power scheme’s viability could have a serious financial impact on a scheme’s success and pay-back period. This should especially be noted by small community projects which probably relied heavily on “expert” advice and could also suffer greatly when the financial benefits did not reach expected levels.

The working group Members were grateful for the opportunity to have a candid and useful meeting with the EA representative. It was apparent that the Agency was working to provide an impartial and independent service to those seeking to implement hydro-power projects, the application process was being simplified and that improvements were being made to partnership working with other organisations, particularly planning authorities.

Water Power and Severn Trent Water

A major generator of hydro-power in Derbyshire is the Severn Trent Water Company. Details from the company informed the review that Severn Trent currently has 2 x 250kw turbines at Ladybower Reservoir, a 300kw output at Staunton Harold Reservoir and feasibility studies were underway for a possible 300kw output at Howden Reservoir in the Upper Derwent Valley and a 30kw system at Derwent Reservoir.

It was noted that Severn Trent has no jurisdiction over rivers and other watercourses and its hydro-power schemes were limited to harnessing the flow of water to and from its reservoirs. However this did enable the generations of the outputs detailed above and was able to help the company offset the large amount of electricity it used in pumping both fresh and waste water around the region.

As well as harnessing water power, Severn Trent actively sought to use other forms of sustainable energy, using gas from sewage, wind-turbines and a power station fuelled by sweetcorn in Nottinghamshire.

Review Conclusions

Following research, meetings and site visits, the review working group reached the following conclusions:

- Small scale hydro-power schemes are viable in many parts of Derbyshire at appropriate locations

- The early involvement of the Environment Agency, Planning Authorities and other regulatory or advisory bodies is crucial for the successful development of projects

- The sympathetic restoration of existing sites (or new build in suitable locations) should have little or no impact on local environments

- A streamlined permissions process was vital to ensure the efficient development of hydro-power projects. The work being done by the Environment Agency, Climate East Midlands and Planning Authorities to facilitate this is acknowledged

- A “one-stop-shop” system where project developers could obtain help and guidance would be very beneficial

- Caution should be advised to prevent over-enthusiastic estimates by project developers and their consultants

- The possible changes to the FIT programme, and the impact on schemes’ income and viability should be highlighted to potential project developers.

- The “number of homes powered” by a projects’ output should be recognised as a measure statistic, and not taken literally to assume local homes would benefit directly from cheap or free electricity (unless residents were investors in a project)

- It would be helpful for the review working group and other interested Members to follow the progress of the Calver Mill scheme to highlight any pitfalls and problems, and how these can be addressed, as well as successful milestones during the project development

Recommendations

The review working group Members make the following recommendations:

1. The potential of water generated energy from Derbyshire watercourses be acknowledged

2. The work of the Environment Agency, Climate East Midlands and Planning Authorities to provide a simplified and co-ordinated application process be encouraged and supported

3. The progress of both the Derby City and the Calver Mill projects be followed by the review working group and/or Improvement and Scrutiny Committee – Places, as examples of success or otherwise

4. That Cabinet consider offering support to potential water power projects by providing advice and information from a central point (for example the Council's website) which would collect and offer information from external agencies as well as the County Council

5. That Cabinet also be asked to consider which Cabinet member should assume responsibility for leading on any initiative in respect of water generated energy and should also consider whether the County Council could introduce a grant or loan scheme to assist with such developments which would help towards our carbon reduction programme

6. The potential of water power in the county, and where information can be obtained, be publicised to encourage more developments.