Shetland Arts Development Agency
Board of Trustees Meeting
Saturday 20 November 2010 at 10.00am
Venue: Toll Clock Offices, Lerwick

Lunch will be provided following the meeting.

Shetland *arts*

AGENDA

Item	Description	Report	Item taken by	ACTION
1	Apologies and welcome	Verbal	Chair	Note
2	**Minutes of last meeting**			
2a	Approval of Board Minute for accuracy – meeting of the 28/09/10	Attached	Chair	Approval
2b	Matters arising that don't appear within the agenda	Verbal	Chair	Discussion
3	**Finance and Management**			
3a	Management Accounts	Attached	Director	Decision
3b	Directors travel update	Attached	Director	Note/ discussion
	Large Scale Project Updates			
4	**Mareel Project**			
4.1	Construction update	Verbal – detailed papers available on Basecamp	Director	Note
4.2	Operational update	Verbal update	Director	Note
4.3	Opening events	Verbal	Director	Discussion
4.4	Between Weathers LLP	Proposed delivery structure and legal note attached	Director	Decision
4.5	Westside Cluster	Attached	Director	Note
5	**Dates of future meetings**			
5a	**SADA Board Meeting:** Thursday 16th December 2010		Chair	Confirm dates and venues for future meetings

CLOSED ITEMS

	Closed items from previous minutes matters arising	None	Chair	
A	Appointment of new Trustees	Attached	Director	Decision
B	Mareel cost report	Verbal update – reports in construction area on Basecamp	Director	Note
C	Recruitment update	Verbal	Director	Note

Minute of a Meeting of Shetland Arts Development Agency Board of Trustees, held at 6.45pm on Tuesday 28th September 2010 at Shetland Museum & Archives, Lerwick (following Mareel Site Visit at 5.30pm)

Present:
Jim Johnston (JJohn), Trustee/Chair, Shetland Arts (Chair)
John Dally (JDal), Trustee, Shetland Arts
Robina Barton (RB), Trustee, Shetland Arts
Joyce Davies (JDav), Trustee, Shetland Arts
Mark Burgess (MB), Trustee, Shetland Arts
James Sinclair (JS), Trustee, Shetland Arts

In Attendance:
Gwilym Gibbons (GG), Director, Shetland Arts
Lynda Anderson, Office Administrator, Shetland Arts (minutes)
Sheila Duncan (SD), Management Accountant, Shetland Arts
Paul Hetherington (PH), Director, The A9 Partnership Ltd

Apologies:
John Goodlad (JG), Trustee, Shetland Arts
Leslie Lowes, (LL), Trustee, Shetland Arts

Item	Topic	Action
1	**Apologies and welcome**	
	Mr Johnston welcomed everyone to the meeting. He introduced Mrs Sheila Duncan, Shetland Arts' Management Accountant and Mr Paul Hetherington, Director of the A9 Partnership Shetland Arts' auditors. Both were in attendance to present the 2009/2010 Annual Accounts to the Board. Apologies were received from Mr Lowes and Mr Goodlad. Mr Johnston thanked Mr Gibbons for arranging the Mareel site visit that took place immediately prior to this meeting. He asked that another visit be arranged for 8 weeks time.	
3	**Finance and Management**	
3c	**Annual Accounts**	
	Given that Mr Hetherington and Mrs Duncan were in attendance to discuss the Annual Accounts, Mr Johnston asked this item be taken first. Mrs Davies asked if the £50,000 Charitable Trust reserve figure is in need of revision. Mr Gibbons noted that more detailed conversations are required around revising this figure. Mr Johnston agreed. Mrs Davies noted the 25% increase in turnover. Mr Gibbons reported that this is predominately due to income for Mirrie Dancers, a large scale capital project.	

	Mr Dally asked about the £10,000 electricity accrual. Mr Gibbons noted this was due to a meter fault at Bonhoga and that this would be the worst case scenario for the corrected bill. Mrs Davies asked what Investment Income refers to. Mrs Duncan replied that this is not investment in stocks and shares, but that when instalments are paid, e.g. from the Charitable Trust, some of the money is placed in high interest accounts. Mr Sinclair acknowledged the current difficulty around providing pension schemes but asked if there is any way we can plan for this. Mr Hetherington said no, that this is dependent on the market and will fluctuate year to year. Mr Gibbons added that Shetland Arts is part of the local government pension scheme, which is underwritten by the Charitable Trust. Mr Johnston asked that Mr Gibbons seek written information on the pension scheme from the Charitable Trust Mr Hetherington noted he was impressed by the compilation of the Annual Accounts report. Mr Johnston, on behalf of the Board, congratulated all involved in compiling the report.	**GG**
3a	**Management Accounts**	
	Mrs Duncan noted there is still significant box office income to come in. The Board approved that income figures be amended to reflect actual income. Mr Johnston asked that it be explained to the Board why music target is out (pg 9 of annual accounts). Mr Gibbons noted this is based on projected income which is difficult to predict. Mrs Davies asked if Shetland Art is insured against event cancellation, Mr Gibbons that we were not and that such insurance is very expensive and rarely economic expect for significant events with large financial risk.	**SD**
	Mr Burgess asked about Business Sponsorship. Mrs Duncan noted that some forms of sponsorship are not always easy to record. For example, donation of equipment for use wouldn't show in the accounts. Mr Johnston noted that Mrs Johan Adamson has resigned as a trustee of Shetland Arts. Mr Johnston will write to Mrs Adamson, thanking her for her input to the organisation and	

	wishing her the best for the future.	
3b	**Director's Travel Update**	
	Mr Gibbons noted he had undertaken a number of off-island trips for meetings regarding Mareel, including with record labels, film producers and branding experts. Mr Burgess asked the benefit of four staff members attending PLASA. Mr Gibbons replied that it was necessary because each of them has an area of specialisation in sound/AV. He also pointed our that he was in London on other business through this period. No purchases were made but this was an opportunity to see the equipment on offer. Mr Burgess asked if this information will be taken back to stakeholders. Mr Gibbons noted that discussions would first be held with local sound engineers. Mrs Davies asked how many decisions on big costs for Mareel have still to be made. Mr Gibbons noted they are about to tender for cinema installation. Mrs Davies asked if all options on sound equipment were being considered before the final decision is made. Mr Gibbons said they are deciding between two sound desks. Mr Dally asked if there is a lead time for supply of these items. Mr Gibbons said yes, but only 6-8 weeks for AV equipment, while lead time for cinema equipment is 4-6 months.	
3d	**Recruitment**	
	Mr Gibbons reported that the closing date has passed for the three new posts of Head of Operations, Head of Programming, and Head of Admin & Finance. Interviews will be held 4th-6th October. The interview panel for Head of Operations is Mr Gibbons, Mr Johnston and Mr David Williams as external advisor. The interview plan for Head of Programming is Mr Gibbons, Mr Burgess and Mr Williams. Mrs Barton asked when the new recruits will begin. Mr Gibbons noted that the start date is currently being reviewed but want this to be close to Mareel opening. Mr Johnston noted time should be allowed for management team to be established. Mr Gibbons noted that two trustee applications have been received. During a discussion around trustees, it was noted that Mr Alan Murdoch's resignation details are not included in the Annual Accounts report. This information will be added.	**Admin**
3e	**Power of Attorney**	
	Mr Gibbons outlined the need for 5 trustees to hold Power of Attorney. Currently, only 3 trustees – Mr Johnston, Mr Sinclair	

	and Mr Goodlad hold this power. It was agreed to add Mr Burgess and Mrs Barton who are also authorized to sign cheques.	
3f	**Endowment for the Arts**	
	Mr Gibbons reported there is nothing to update, and there have been no developments on the Endowment for the Arts ideas but the plan is to approach potential funders. Development of the programme will be picked up by the new management team. Endowment for the Arts will remain a regular agenda item, to ensure future updates.	**Agenda**
2	**Minutes of the Last Meeting**	
	Mr Johnston asked about the lack of funding for some of the proposed future staffing posts. Mr Gibbons noted that this has not progressed, and confirmed that the posts will not be advertised if money is not in place. Mr Johnston asked for volunteers for the finance subgroup. It was agreed that Mr Johnston will ask Mr Goodlad. Mr Gibbons noted that Florence Grains is the new cultural spokesperson for Shetland Islands Council. Mr Gibbons will meet with her. The minutes of the meeting were approved.	
4	**Mareel Project**	
4.1	**Construction Update**	
	Mr Burgess asked whether construction is still on time and on budget. Mr Gibbons replied yes. A discussion on closed matters followed.	
4.2	**Operations Update**	
	Mr Gibbons reported recruitment of staff and purchase of equipment are the main Operations Issues currently being addressed. Much work has been done on developing an identity for Mareel. The Mareel Brand was presented to the Board as a closed item, for their approval.	
4.3	**Between Weathers**	
	Mr Gibbons reported that he has been in discussions with B4Films regarding the upcoming feature film, Between Weathers. It is planned the film will be shot May/June/July 2011. At present it is difficult to predict when exactly the go ahead for filming will be given – could be 6 weeks prior to start date. Social investors are being sought. Mr Gibbons noted there is a need to formalise Shetland Arts' relationship with B4 Films, as outlined in the report provided to Board. The recommendation to the Board is that Shetland	

	Arts form a Limited Liability Partnership (LLP) with B4 Films. The only risk with this is loss of finances to set up this partnership, and in time invested. Mr Gibbons added that in addition to establishing an LLP with B4 Films, a second recommendation is to establish a Community Interest Committee (CIC) to enable profits to be distributed within the Community. Mr Johnston asked why the Board is not waiting for final legal advice before making these decisions. Mr Gibbons replied that he has arranged to talk with a specialist film/media lawyer. A discussion was held around how film finances would fit into management accounts to enable Shetland Arts to retain Charitable Status. Mr Gibbons reported this would be similar to having a trading subsidiary, examples of which are Shetland Museum & Archives, and Shetland Amenity Trust. Mr Johnston asked the cost implications of setting up a CIC. Mr Gibbons reported this would cost £1200. Mr Gibbons added that the assets within the CIC cannot leave the community. Mrs Barton asked that a legal opinion be sent out to trustees. All agreed that more legal information was required by the Board, and to hold this decision until the next meeting, Mr Johnston asked that the item be added to the agenda of the next Board meeting. Mr Johnson also asked why this would be a Mareel CIC and not SADA CIC. Mr Gibbons agreed that the names need to be considered.	**Agenda**
5	**Dates of future meetings and frequency**	
	Mr Johnston invited thoughts from the Board on possible dates for future Board meetings. It was agreed this will be discussed at the next Board Meeting.	**Agenda**
5a	**SADA Board Meeting**	
	The next SADA Board Meeting will be held on Wednesday 10th November, at The Mill Café, Bonhoga.	
6.0	**AOB**	
6.1	There was no other business to discuss.	

Income	Approved Board	Revised Budget	Quarter 1 Apr - Jun	Quarter 2 July - Sept						Projected Year End
	2010 - 2011 Budget for the Year	2010-2011 (less Mareel)	Actual April/May/June	Actual July/Aug/ Sept	Variance against estimates £	% of actual income against budget estimates	Remainder between actual income and yr budget	Notes	Total	
Box Office/Programme income	£ 172,350	£ 127,400	14,642.99	35,849.26	76,908	40%	£ 157,707	1	50,492.25	108187
Ancillary Earned Income	£ 276,700	£ 197,937	29,870.69	47,544.53	120,522	39%	£ 246,829	2	77,415.22	126569
Other Earned Income	£ 12,000	£ 12,000	16,135.02	34,494.14	-38,629	422%	£ 4,135	2	50,629.16	34618
Business Sponsorship	£ 7,100	£ 7,100	100.00	3,660.00	3,340	53%	£ 7,000	3	3,760.00	6546
Trusts, Donations	£ 73,715	£ 73,715	183.69	20,623.10	52,908	28%	£ 73,531	3	20,806.79	44488
Revenue Scottish Arts Council	£ 156,803	£ 156,803	52,268.00	28,634.00	75,901	52%	£ 104,535		80,902.00	156803
Project Funding SAC (Voted and Lottery)	£ 70,000	£ 60,000	6,648.00	83,656.48	-30,304	151%	£ 63,352	4	90,304.48	127130
Local Authority - Project Funding	£ 0	£ 0	-5,107.00	-2,595.60	7,703		£ 5,107	4	-7,702.60	5887
Other Public Funds	£ 830,959	£ 767,038	352,444.00	44,657.71	369,936	52%	£ 478,515	4	397,101.71	795509
Total Income	£ 1,599,627	£ 1,401,993	£ 467,185	£ 296,524	£ 638,284	54%	£ 1,132,442		763,709.01	1405737

Expenditure	Approved Board	Revised Budget	Quarter 1 Apr - Jun	Quarter 2 July - Sept						Projected Year End
	2010 - 2011 Budget for the Year	2010-2011 (less Mareel)	Actual April/May/June	Actual July/Aug/ Sept	Variance against estimates £	% of actual spend against budget estimates	Remainder between actual spend and yr budget	Notes	Total	
All Staff Costs	887,018	796,057	203,202.87	140,928.40	451,926	43%	£ 683,815	5	344,131.27	812500
Programme	183,707	127,857	28,433.03	96,450.25	2,974	98%	£ 155,274	6	124,883.28	187109
Marketing Projects	43,920	12,920	4,375.94	7,854.00	690	95%	£ 39,544	6	12,229.94	15929
Marketing (Strategic)	20,000	20,000	3,215.14	23,017.75	-6,233	131%	£ 16,785	7	26,232.89	26931
Education	159,713	159,713	19,871.57	20,111.86	119,730	25%	£ 139,841	6	39,983.43	50742
Project Overheads	0	0	470.64	20.93	-492		£ 471	6	491.57	504
Overheads	305,268	285,446	69,678.15	93,836.66	121,931	57%	£ 235,590	8	163,514.81	308135
Other Expenses	0	0	36.72	0.00	-37		£ 37		36.72	0
Total Expenditure	1,599,626	1,401,993	329,284	382,220		51%	£ 1,270,342		711,503.91	1401850

Total Expenditure	1,599,626	1,401,993	329,284	382,220	0	51%	£ 1,270,342
Total Income	1,599,627	1,401,993	467,185	296,524	638,284	232%	£ 1,132,442
Net Surplus/Deficit	1		137,901	-85,696	638,284		

Management A/C	Income	467,185.39	296,523.62	763,709.01
Mareel Captital Costs	Income	1,186,901.30	1,495,621.17	2,682,522.47
	Total Income	1,654,086.69	1,792,144.79	3,446,231.48
Management A/C	Expenditure	329,284.06	382,219.85	711,503.91
Mareel Captital Costs	Expenditure	946,290.31	1,587,296.62	2,533,586.93
	Total Expenditure	1,275,574.37	1,969,516.47	3,245,090.84

NOTES

Total net Profit/Loss on quarter	-85,696.23

Notes to Management Accounts (July – September) 2010/11

Included in report layout is a new column showing the revised budget to the end of March, 2011 to reflect the removal of the Mareel operational budget figures which we know will not be required in this financial year. We have also added into the budgets £52,000 grant income from Shetland Charitable Trust in respect of Planned Maintenance with the respective cost included under Overhead.

The figures in the attached report relate to the period July to September and also show the previous period (April to June) for comparison. The draft accounts have now been completed and the amended opening balances have been incorporated in these figures.

Income

1. The anticipated total for the year end is expected to show a shortfall of around £19,000, approximately half attributed to the Garrison Films and the rest across the board.

2. Ancillary Earned Income/Other Earned Income also is anticipated to show a shortfall in the year end figures of around £49,000 on the revised budget. Exhibitions, Box Office 10p ticket recharge and bank interest are the main areas which fall short of budget. We would emphasise art officers have achieved higher than expected other earned income.

3. Business sponsorship/trusts/donations – are also well below budget. Efforts have been made to attract income in this area, but this has been difficult and with the present economic climate we are not expected to improve this figure greatly by the year end.

4. Project Funding (Voted and Lottery) and Other Public funds project income is projected to be greater than expected by £101,000. Arts Development is attracting the majority of the increase, but strategic projects such as The Voyage and the Creative Finance Study is also contributing to the overall total.

   (Please note, the overall actual Other Public Funds total includes £722,038 core and planned maintenance funding from SCT)

Expenditure

5. September salaries figures still to be included which are expected to be around £65,000. Currently, we estimate that the all staff costs total figure by the year end should be £812,500, which is £16,000 more than

the revised budget. We will endeavour to keep all costs, including training and travel spending to a minimum for the remainder of the year to reduce this overspend if at all possible.

6. Project programming, marketing and education budgets we project will be under spent at the year end and this is reflected in the estimated overall income (which is also lower). You will note that more has been spent on programming than education as a result of the projects that have taken place this year.

7. Strategic Marketing – a large piece on consultative work was undertaken for almost £8,000 with Creative Finance Scotland and a large advert in the Northlink Brochure for almost £2,000 is included in this figure.

8. Overheads: We are projecting that the spend for the year will be approximately £308,000, which if £22,500 over budget. Most of this overspend has been caused by the purchase of projection equipment (£15,319) for the Garrison and the payment of bonds costing £3,250 needed to in order that we can purchase films now Filmobile are no longer being used. The bonds are repayable to us if we no longer deal with the individual film distributor, so this cost will be removed and shown as a debtor. The projection equipment is estimated to pay for itself given we can now retain a higher proportion of film takings.

Summary:

This has been a very busy period for Shetland Arts with numerous large projects over the summer and their outcomes are in the process of being analysed. The next quarter will be vital in ensuring that our targets and expected income/expenditure figures are being addressed. We will need to strive to save costs wherever possible and generate further income to ensure a break even position at the year end.

Shetland *arts*

To: Board of Trustees – Shetland Arts 20 November 2010

From: Director, Shetland Arts

1. Trips undertaken off island by the Director since last Board Meeting (28 Sept 2010)

When	Where	Why
30/09/10	Edinburgh	(re)evolver session
14/10/10	London	Franklin Rae Make Happy
15/10/10	Glasgow	Tods Murray LLP Between Weathers meeting
02/11/10	Inverness	ERDF Advisory Group
03/11/10 – 06/11/10	Glasgow	Foundation Organisation Day – Creative Scotland GHA Meetings Law At Work Meeting B4Films Meeting
12/11/10 – 13/11/10	Inverness	Old Maps and New: Culture Conference
15/11/10 – 16/11/10	London	Meetings with: Whizz Kid, CBTR, Eagle Rock and others

2. Director planned off island trips

When	Where	Why
22/12/10 – 23/12/10	Edinburgh	B4Films meeting and GHA meeting
17/03/11 – 18/03/11	Glasgow	Creative Scotland and GHA Meetings

3. Recommendations

The Board are asked to note the above report.

wedidthis.org.uk

The **purpose** of **wedidthis** is to evolve the arts by enriching funders.

Our **vision** is to be the world's marketplace for the arts, by being:-
- Compelling
- Sustainable
- Independent
- Collaborative
- Enriching

wedidthis.org.uk

- To achieve our vision, we will launch a new crowdfunding platform for UK Arts and Cultural organisations, supported by an on- and offline campaign positioning the site as the positive response to public funding cuts.

- We will supplement the prototype site with funders fayres through late 2010/ early 2011

- We are currently working to:-

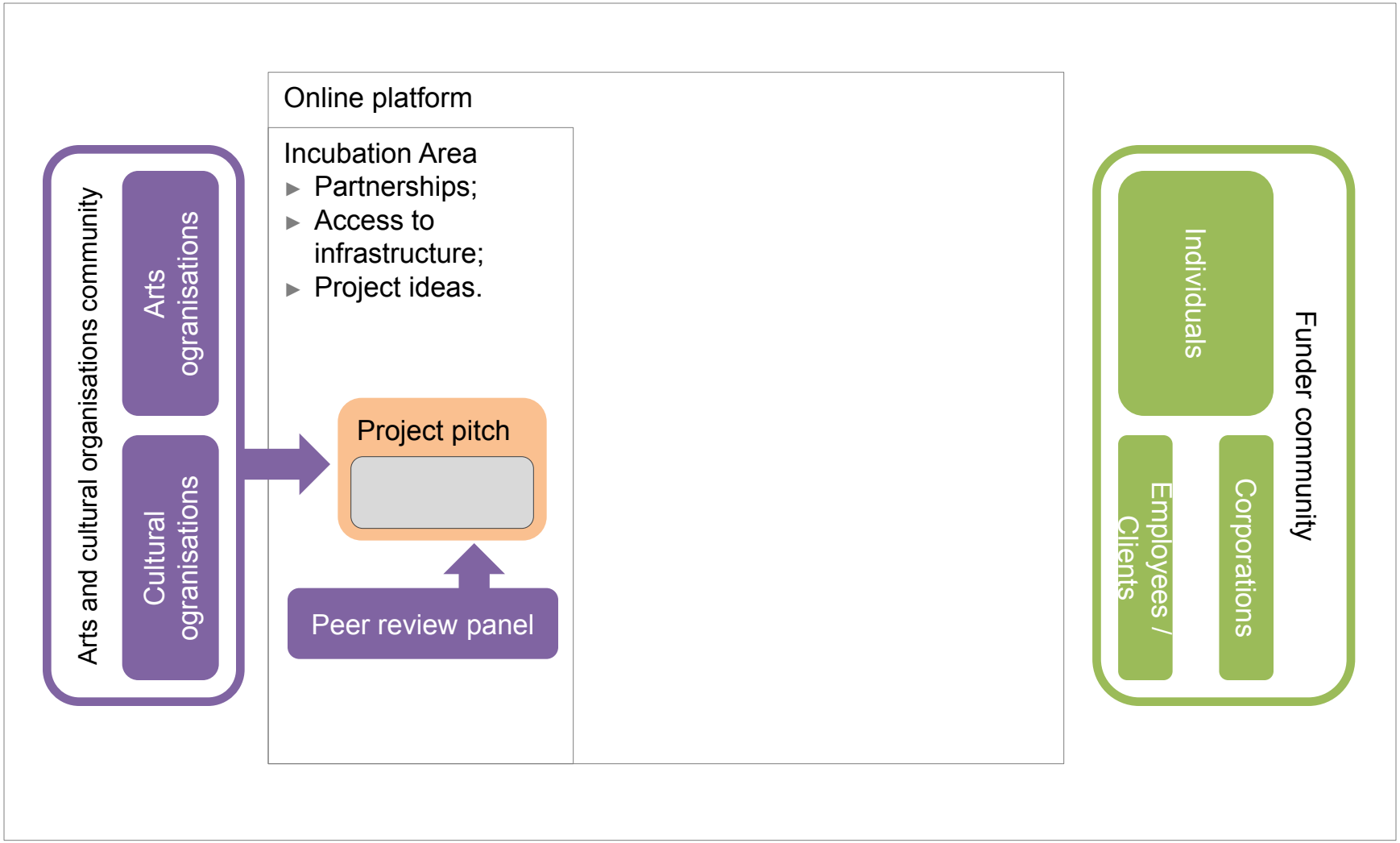
- build a winning portfolio of arts project pitches, including diversity of artform, size of institution, and geographical reach.

- build supportive networks and communities within the arts and NFP community, who will be key in marketing and growing the site.

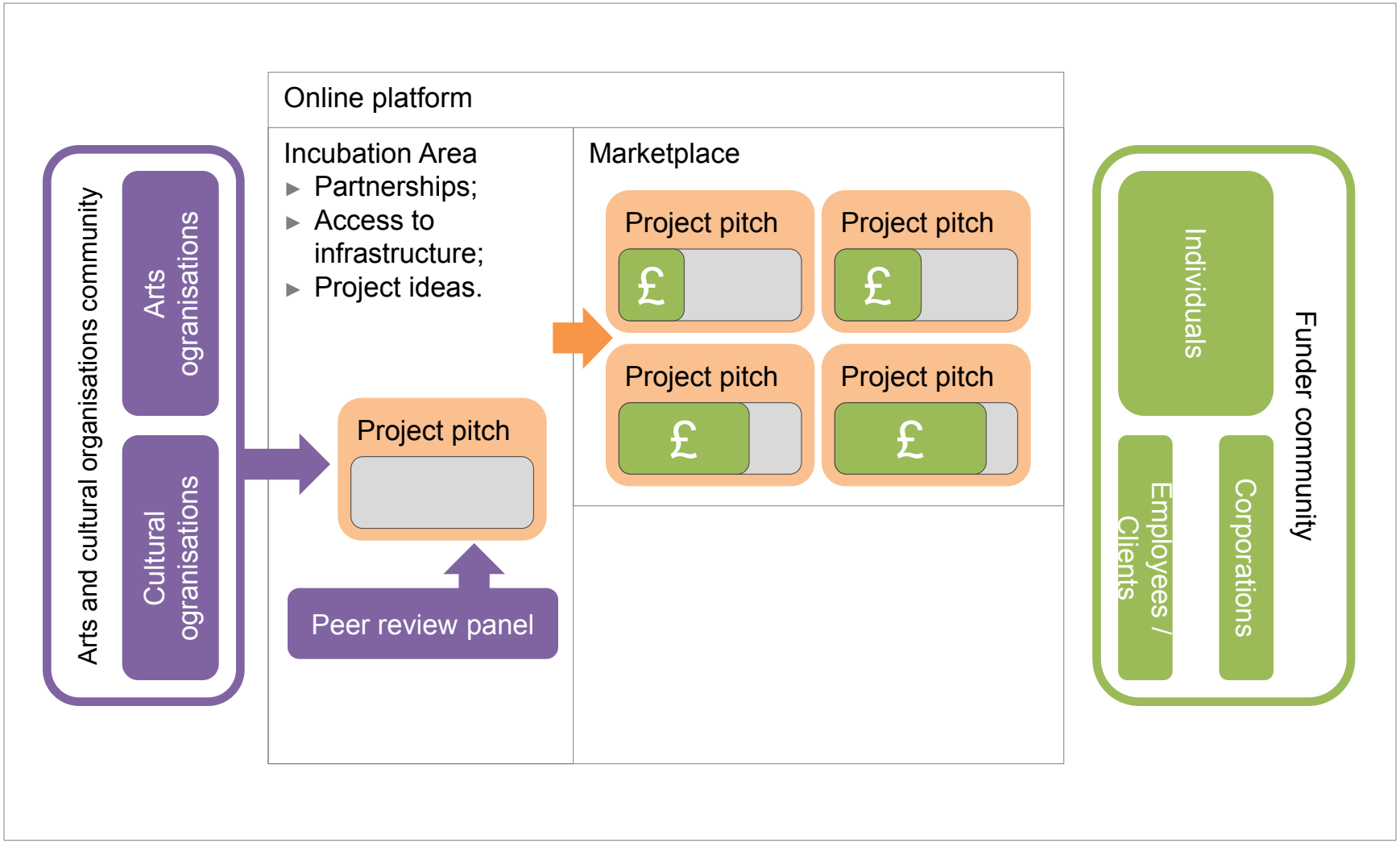
- finalise the design and technical spec for the site, and start building!

1. Take disparate arts and cultural organisations and their funding networks, and corporate interest…

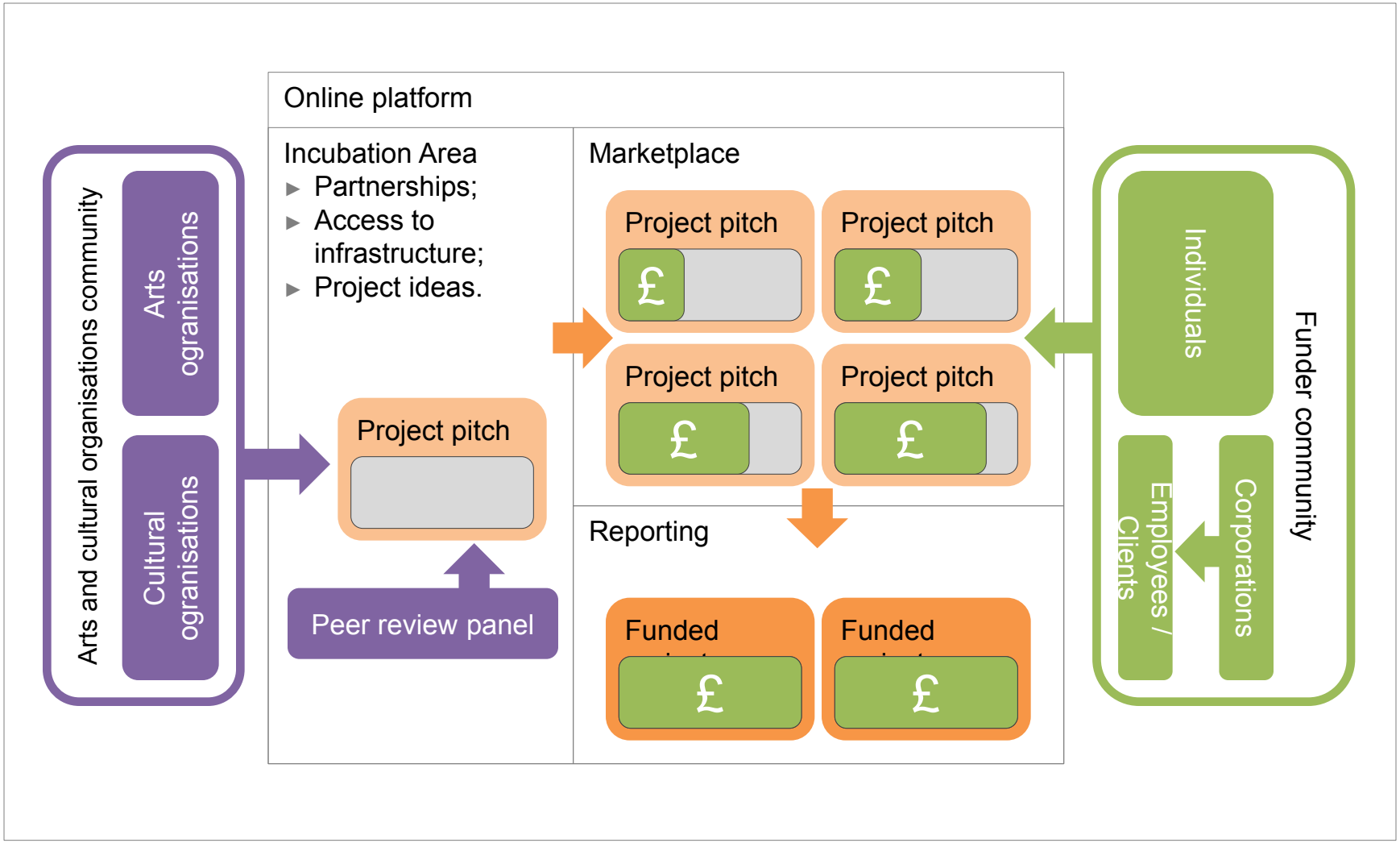
2. Create opportunity for arts and cultural organisations to come together and create project ideas, with access to 'free' publicly-owned infrastructure and support from expert peers



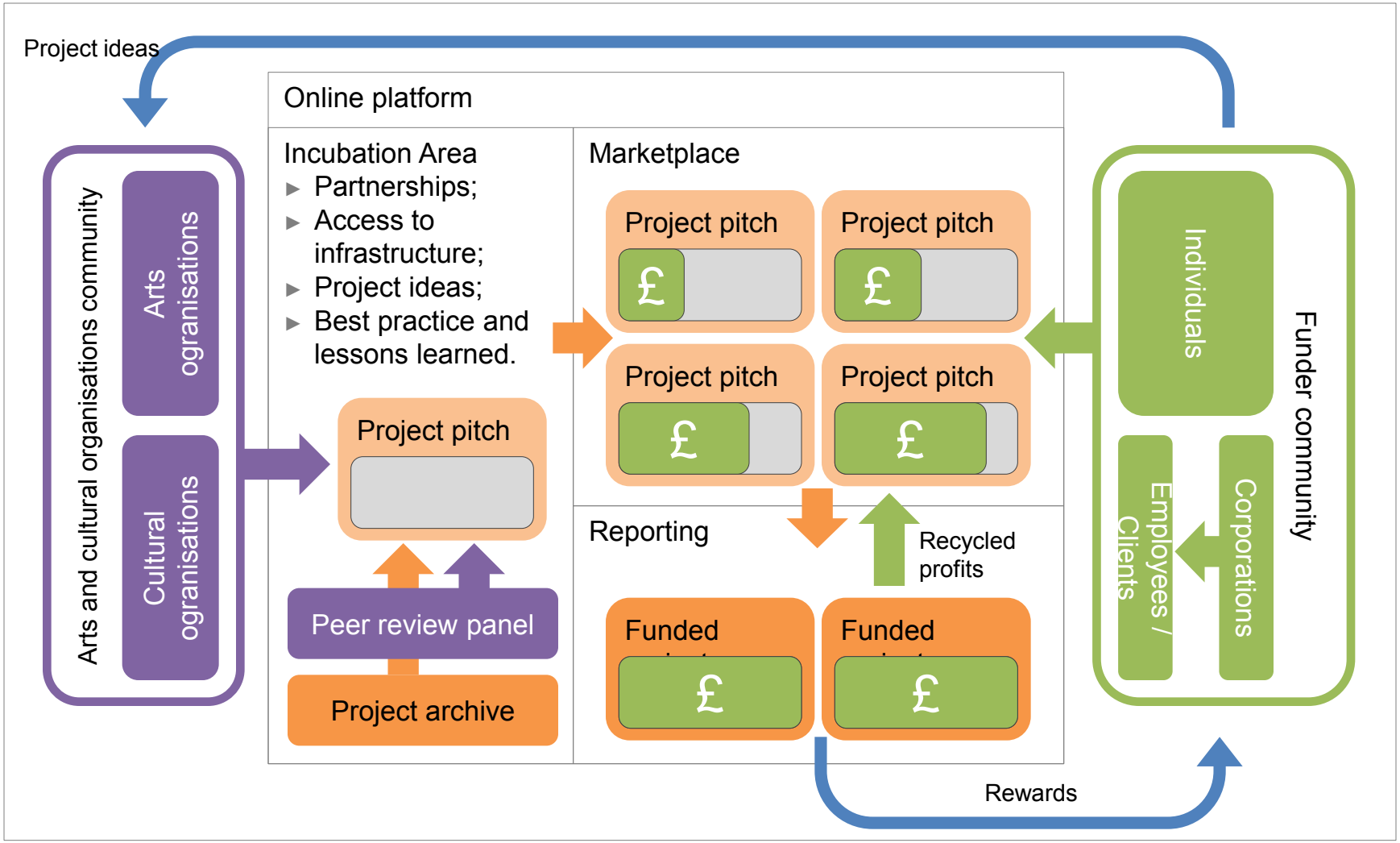
3. Create a platform for these organisations to present their projects to the funding community, on their own or in partnership



4. Secure 'crowd' funding from individuals, and enable corporations to fund through their employees and clients, leading to well-supported projects

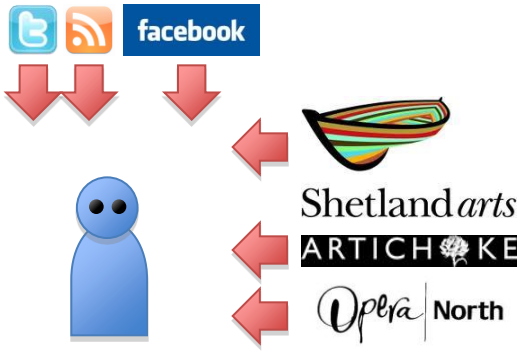
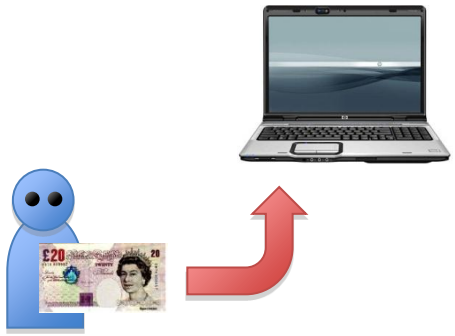
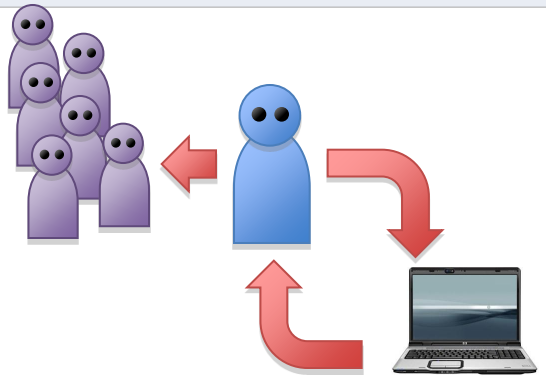


5. Successful projects provide rewards for funders and profits to recycle, and project lessons can be archived to improve future ideas



wedidthis.org.uk: user journeys

1. Individual funder

		
1. Hears about arts project on website from arts organisation subscriber list, Facebook, etc	2. Browses marketplace pages on website	3. Assesses projects, including browsing reward offers
		
4. Contributes money to projects through website payment platform	5. Receives updates from project (and offers feedback), tells friends	6. Enjoys project/performance!

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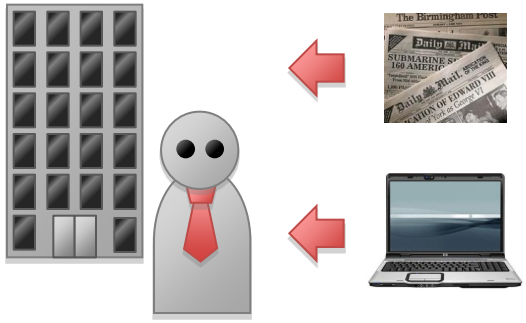
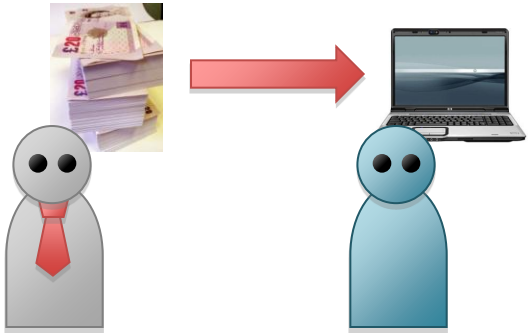
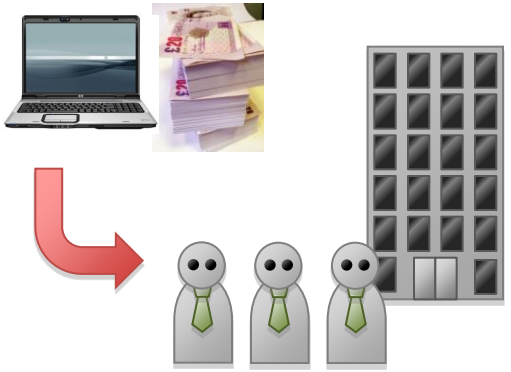
2. Corporate funder



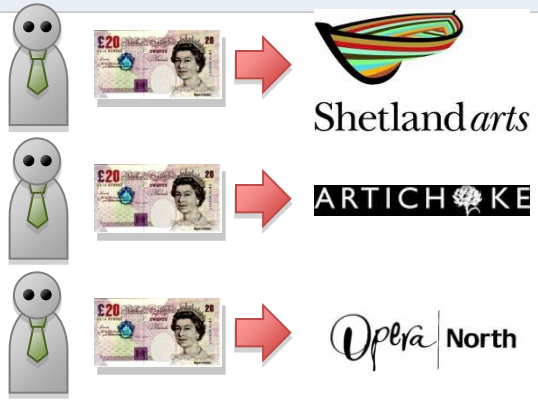
1. Hears about platform from wdt.org team or word of mouth



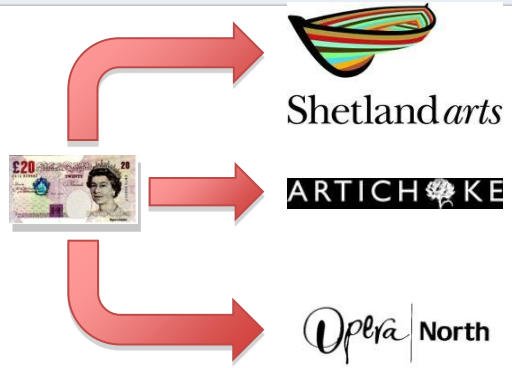
2. Agrees donation with **wedidthis.org.uk**



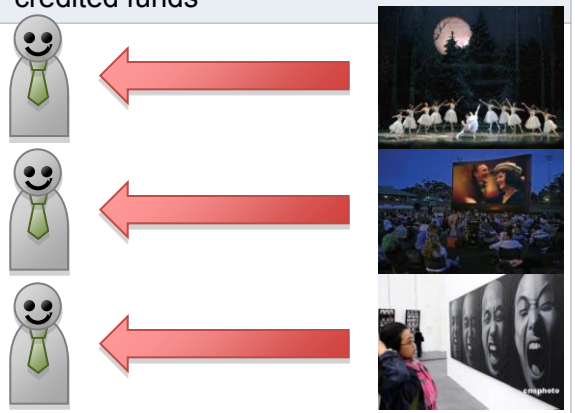
3. Nominates funders – clients or employees – who receive accounts with credited funds



4. Players browse marketplace and contribute to projects as individuals



5. Unspent money swept into site on pro rata basis following elapse of agreed time period



6. Individuals enjoy projects, corporation benefits from deeper association with giving

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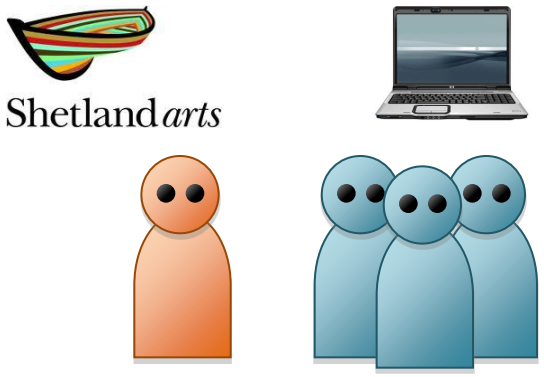
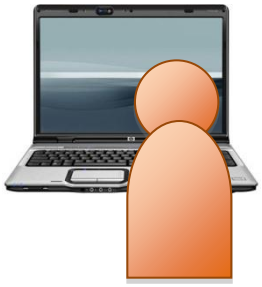
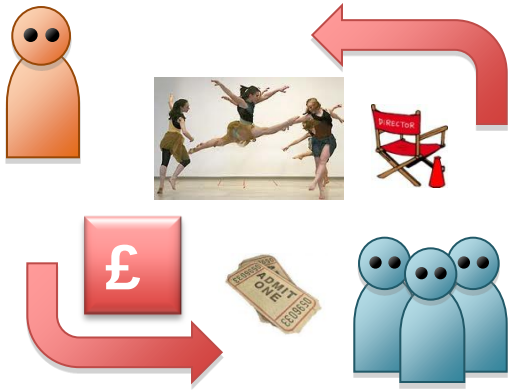
3. Arts and cultural organisation



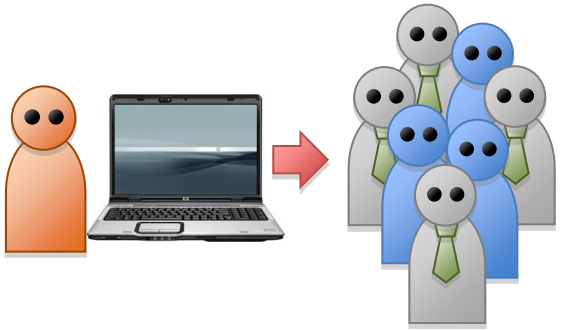
1. Arts organisation invited to join site by peer review panel



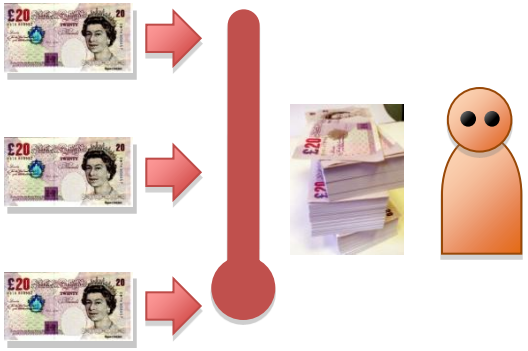
2. Browses 'incubator' area for partnership ideas, innovation opportunities



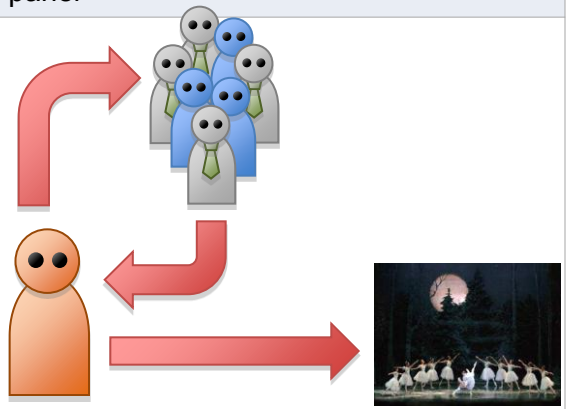
3. Devises project, costs and reward structure, and iterates with peer review panel



4. Pitches to marketplace, and starts marketing the project to funder/audience base.



5. If the funding target reached, the project receives funds



6. Update funders throughout project development, solicit feedback, deliver project

wedidthis.org.uk

Outline development plan

Summer 2010	September – October 2010	November 2010
1. Initial proposal - clear concept with steering and expert groups. Build core project group.	2. Build prototype site with design partner. Market concept to A&CO community	3. Launch prototype site showcasing small number of projects a month; build participant community activity (inc offline events); identify first corporate funders
Spring 2011	**Spring / Summer 2011**	**Summer 2011**
4..Grow project portfolio. Raise money from individuals and corporations (or grant funding) to fund next phase.	5. Build additional features - full marketplace, incubation area, corporate funding functionality	6. Full website launch

Shetland *arts*

To: Board of Trustees – Shetland Arts 20 November 2010

From: Director, Shetland Arts

Between Weathers the Movie

1. Background

Further to the report to the SADA Board on 28 September considerable work has been done and legal opinion sought regards the formation of a partnership between Shetland Arts and B4Films for the delivery of Between Weathers a feature film due to be shot in Shetland in May, June and July 2011.

2. Update on partnership development

Shetland Arts as developed the project delivery model and organisational relationships between various parties since the Board meeting of the 28 Sept 2010. Appendix 4.4a shows the structure for partnership delivery and the relationship between B4Films, Shetland Arts and Shetland Arts CIC (name to be agreed). Appendix 4.4b is a legal note from our specialist appointed Lawyers Tods Murry LLP regards our proposed partnership model.

Since the last meeting Shetland Arts has also been progressing plans on 'crowd sourcing' the Movie with a new UK wide arts dedicated 'crowd sourcing' website, due to be launched in London at the end of January 2011. See appendix 4.4c

3. Recommendation

1. Shetland Arts instructs lawyers to form a Limited Liability Partnership (LLP) with B4Films to deliver the Between Weathers project, called Between Weathers LLP.

2. Shetland Arts instructs lawyers to prepare paperwork for a new body called Shetland Arts CIC with a view to a recommendation to be made to the Board at a special Board meeting in mid January 2011.

Appendix:

A Between Weathers Delivery Structure
B Tods Murray Legal Note
C Crowd sourcing website information

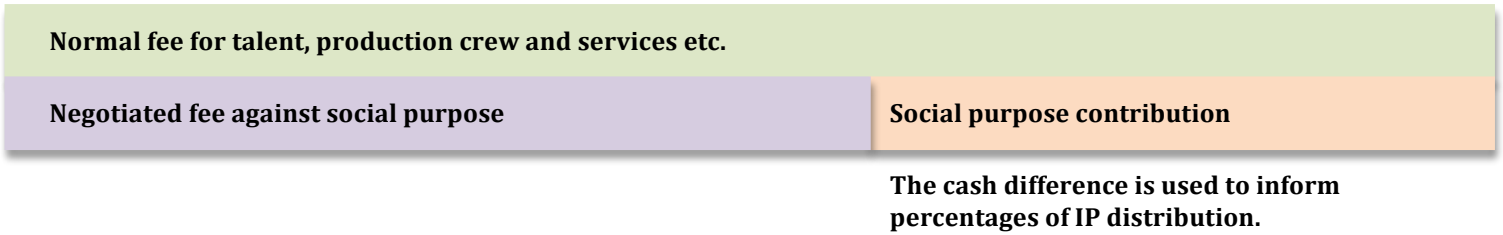
Between Weathers the Movie
Proposed Social Enterprise Delivery Model

Roles and principles to support heads of agreement:

Overarching aim is to ensure as much of the IP of the film and backend activity as possible stays within Shetland to support future film and TV location and arts development activity in the isles.

1. Shetland Arts Development Agency, Shetland IP CIC and B4Films will form an LLP called Between Weathers as the vehicle to commission the making of the film, distribute income and IP related to the film and associated activity.
2. Between Weathers LLP will commission B4Films to make Between Weathers. As part of this commission B4Films will enter into contracts with all associated talent, crew and suppliers to deliver a fully mastered film ready for distribution. B4Film will take out a Production Bond to cover risk of non-completion of the film.
3. B4Films when negotiating agreements with external partners will seek to minimise the signing away of IP points. All distribution agreement for IP will be agreed by the LLP.

Placing a value on the Social Investment model to Between Weathers the Movie
Example of calculation model:

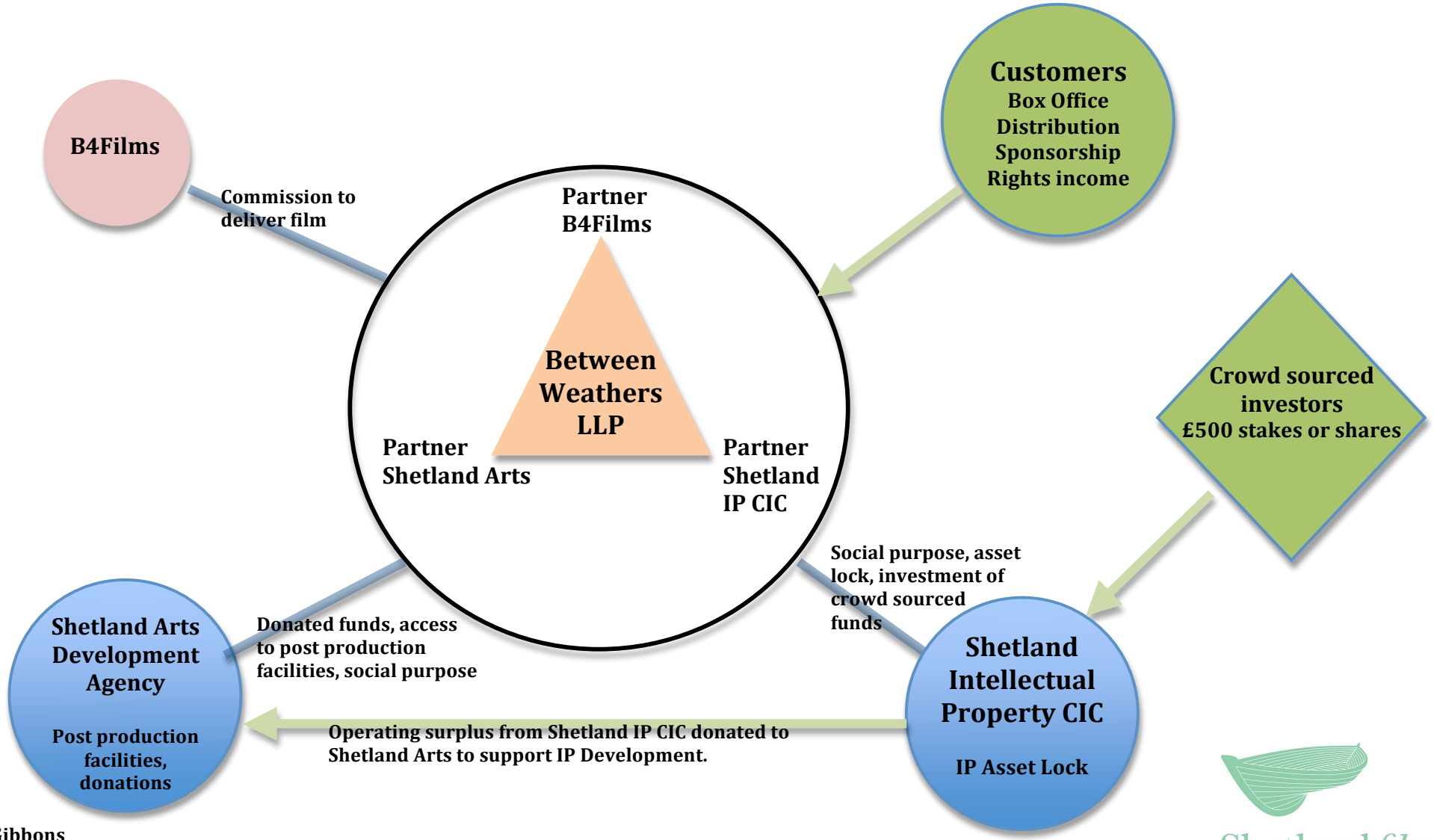


The intention of the above model is to ensure that anyone agreeing to a reduced fee because that support the vision for Shetland to benefit from the IP Ownership of the film, that their gift is recognised/ protected and not exploited by a commercial distributer or investor.

Gwilym Gibbons
Shetland Arts Development Agency – 22 October 2010

Shetland *film*

Between Weathers the Movie
Proposed Social Enterprise Delivery Model



Gwilym Gibbons
Shetland Arts Development Agency – 22 October 2010

Shetland*film*

NOTE TO TRUSTEES OF SHETLAND ARTS DEVELOPMENT AGENCY

S10503.1001

Structure – Feature Film "Between Weathers"

Shetland Film Community Interest Company ('SFCIC')

The proposed initiative appears to fit the social enterprise objectives required of Community Interest Companies. The benefits of limited liability status can be enjoyed, the community can benefit from the investment and profit of the film/s and the regulatory restrictions of charitable status are avoided whilst encouraging third party contribution to essentially a non profit enterprise. SFCIC formed as a CIC allows the vehicle to operate more commercially and have greater freedom than a charity and can provide a limited return to investors. CIC's are subject to corporation tax on profit and careful administration will be required to minimise any potential charge.

SFCIC must of course pass the 'community interest test' and the Regulator will consider the purpose for which SFCIC was set up, the range of activities in which it will engage and who will be seen to be benefitting from its activities. Generally the Regulator will need to be satisfied that SFCIC's purposes could be regarded as being in the community or wider public interest and not confined to an unduly restricted group. It is a 'light touch' test and from the information supplied it would appear that SFCIC would be able to meet it. Everything SFCIC does should contribute towards achieving a purpose that is beneficial to the community.

SFCIC must have an asset lock and it is noted that the IP of "Between Weathers" and any subsequent film/s would be held within this lock. Thus such IP assets require to be retained and used for community purposes only and may only be transferred out of SFCIC in very specific circumstances, e.g. being transferred for full consideration; transferred to another asset locked body as specified in SFCIC's constitution or to another asset locked body with the consent of the Regulator; and the Regulator is satisfied that it is made for the benefit of the community.

We have concerns that if SFCIC acquires IP rights in the underlying material (eg script) at outset under the asset lock rules this would preclude providing the usual profit share and turnaround /rights reversion benefits expected by creatives. This potential difficulty may be resolved if SFCIC commissions Between Weathers LLP ('LLP') to make the film, the LLP initially acquires all rights but only delivers the film to SFCIC upon completion. Such delivery may need to be under reservation of the distribution rights in the film to enable the LLP to distribute the film, deal with recoupment of LLP investments and provide standard industry profit shares to creatives. This aspect would require to be checked with the CIC Regulator. It is hoped that the Regulator should be satisfied that delivery of the film to SFCIC in the manner mentioned above should not be classed as a transfer breaching community benefit rules.

It is noted that the co-producers are offering stakes in the film at £500 each. If each stakeholder is treated as a shareholder of SFCIC then as each investment is made the funds are caught by SFCIC's asset lock and can only be used for benefit of the community. The stakeholders will therefore only be able to receive their investment back by means of a dividend and this aspect is subject to regulation. There are rules in place to ensure that dividend distributions by CIC's are not disproportionate to the amount invested and also the aggregate profits made by the CIC in any one year. In the current year the Regulator has set a cap of 20% of the paid up value of a share as the maximum dividend capable of being

distributed and this is also subject to an aggregate dividend cap of 35% of distributable profits in respect of all dividend distributions. Thus the recoupment by the 'crowd sourced investors' and such like has to be staggered and will take many years to complete. The stakeholders contributions could of course be treated as a performance related loan but similarly there are caps on interest levels. http://www.cicregulator.gov.uk/Notices-%20Dividend%20&%20Interest%20Cap%20v01.pdf

With regard to stakeholders being able to take advantage of various tax breaks, we would comment that individuals should be advised to obtain their own advice in relation to this matter. The previous incentives afforded to individuals relating to investment in film have been steadily removed by HMRC and replaced by a tax credit for UK film production companies. For reasons stated below it is doubtful whether SFCIC itself will qualify to enable it to obtain any tax credit and the LLP, being tax transparent, may similarly have difficulties in making a relevant claim.

Between Weathers LLP ('LLP')

SADA as a member of the proposed LLP will require to ensure that its investment in kind is accordance with its charitable objects and its business plan. It would be useful to clarify the extent of such investment as a proportion of total budget and in particular any financial investment as concerns may be raised over the nature of such investment if a) the project was considered to be of a commercial nature and b) there was potential for the co-mixing of charity funds designated for public benefit with third party commercial investment and the possibility for such funds to be indirectly distributed to such third party. These concerns may be avoided if a) the investment by SADA was made say via a trading subsidiary and/or b) the project was set up very much as an educational & community development initiative and all parties involved were not receiving a full commercial return.

We presume that the structure envisaged is that SFCIC would enter into a commissioning agreement with the LLP to produce 'Between Weathers' in accordance with a specification and delivery schedule. Under this arrangement we believe that SFCIC would not qualify for any UK tax credit as it is standard rule that a company cannot simply commission the entire production of the film from someone else without having any active engagement itself. Being tax transparent we believe that the LLP would not qualify, however consideration should be given to adjusting the contractual arrangements between B4 Films and the LLP to ensure that B4's "effective creative, technical and artistic contribution to the film" is sufficient to enable them to qualify for the tax credit. It may then be possible to agree for such tax credit to be re-applied for the benefit the LLP. The level of the tax credit should of course be ascertained for a costs /benefits analysis of this exercise.

We believe that it may be prudent for SADA to consider having the structure reviewed by a tax specialist if tax benefits are felt to be critical to the film's budget and ultimate benefit to the community.

It is recognised that the LLP in this case is not likely to be of a typical kind, but it may assist for the moment if we list some of the clauses that would usually be found in the Members Agreement of a fairly standard LLP. Normal provisions would include details of each member, a description of the business they intend to carry on, any requirements to contribute capital and/or loans, the payment of any interest on such capital and/or loans, banking arrangements including authority to sign cheques, division of profits, non-responsibility for

losses, preparation of annual accounts, preparation of quarterly or monthly management accounts, goodwill, time commitment of each member, meetings, decision-making, voting rights, delegation of certain powers to a board or committee, death of a member, resignation of a member, admission of a new member, expulsion of a member for gross default, restrictions on assisting competing ventures, winding up, dispute resolution, and governing law.

We also should highlight that it may be more appropriate to set out the contractual obligations of B4Films in connection with the film as a separate agreement between the LLP and B4 as B4's obligations on that count arise not so much out of their membership status of the LLP but as a service provider to the LLP. We should also flag up that we suspect that the identity and extent of "Large Investor's" stake in the film and how recoupment will be effected is currently unknown that thus a variation of the LLP members agreement will be required further down the line.

It is beyond the scope of this Note to deal with financial services legislation, but it would be appropriate to mention here a point which was raised in the conference call with Mr Gibbons on 29 September. Section 21 of the Financial Services and Markets Act 2000 states that "A person must not, in the course of a business, communicate an invitation to engage in investment activity". There are various exceptions, but unless such an invitation falls within one of them, the communication of such an invitation is a criminal offence. We do not say that the wording already appearing on www.betweenweathers.com under the heading "A Unique Investment Opportunity" necessarily contravenes the section, but it might be argued that it does so. At this stage we are only drawing the matter to your attention, so that it can be given careful consideration.

We hope the above observations will assist in your deliberations over the structure of the 'Between Weather' project.

Richard Findlay and Granger Brash,

Tods Murray LLP, Edinburgh Quay, 133 Fountainbridge, Edinburgh EH3 6DW

Shetland *arts*

To: Board of Trustees – Shetland Arts 20 November 2010

From: Director, Shetland Arts

WESTSIDE CLUSTER UPDATE NOVEMBER 2010

1. Shetland Arts now owns the Hatchery; handover date was 18 November 2010. At time of writing apart from trustees' signatures on the final paperwork everything else was completed. We have a mortgage holiday until May 2011.

2. Feasibility work on the micro hydro energy scheme has been completed. See appendices A/B.

3. Shetland Arts met with the Shetland Anglers Association's representatives last week and they move into the Hatchery very soon. A lease has been drawn up. David Pottinger from SAA attended Hatchery with Keith Morrison and raised the water level so that the input of water used for raising fish eggs

4. Shetland Arts will meet SEPA next week to discuss fish passes/ladders, the dam registration, possible grants, etc.

5. Shetland Arts received the IT Power Report on the Micro Hydro Feasibility Study – will post on base camp.

6. After discussion with SIC Development and HIE on obtaining money for a Feasibility Study for the Westside Cluster HIE decided instead to give Shetland Arts a business advisor to work with Mary Smith to create a document similar to a Feasibility Study. The money for the Feasibility Study may still be available but HIE and SIC Development wanted considerable cost details, etc before giving money for a Feasibility Study. A choice of three business advisors resulted in Steven Coutts from Weisdale being appointed. He met with Mary Smith last week and has given her the first task which she is currently working on.

7. Insurance has been taken out on the building. When a final decision has been agreed on who will be based there an updated figure will be given to the insurers re- building contents.

8. The site will be pegged out in the next few weeks, then fenced.

9. An application has been made to SIC for planning consent to erect an 'Overflow Car Park' sign at the Hatchery for Bonhoga Gallery traffic

10. Decision has to be made on the number of staff working from the Hatchery so plans can be made to refurbish the space and plan on moving staff, hopefully in spring 2011.

11. An artist impression by Mike Finnie to illustrate what the Westside Cluster could look like has been made – this is not 'real' but shows possible funders an impression of what a cluster could look like.

The Board are asked to note the above report.

Gwilym Gibbons 20/11/2010

IT Power Ref. 1098

Shetland and Western Isles Micro-hydro Feasibility Study

Phase 4 Report

Weisdale Mill – Shetland Isles

1. Executive Summary

In June 2010 IT Power reported on Phases 1 and 2 of the Shetland and Western Isles Micro-hydro Feasibility Study, supported by Community Energy Scotland, which covered a total of eleven sites in Shetland, six of which were deemed as viable. The Weisdale Mill micro-hydro power (MHP) project is one of those schemes, which is being lead by Shetland Arts Development Agency (SADA), with Mary Smith and Richard Wemyss as the key contacts.

Since the Phase 2 of the study, IT Power has been working closely with Community Energy Scotland (CES) to move the 3 identified projects in Shetland (and 4 in the Western Isles) through to Phase 3 (a technical refinement of the previous work) and Phase 4 (the final reporting stage) aiming to cover the following:

- Grid connection logistics and costs
- Refinement of hydrological assessment, energy capture and value of scheme
- Civil and turbine designs
- Project costs
- Maintenance schedules
- Project scheduling
- SEPA and planning permissions
- Income and economic performance

One of the primary aspects to clarify in Shetland was the grid connection aspects of renewable energy, which is constrained by the fact that Shetland operates as a grid isolated from the main UK network with limits on the power capacity of the grid lines. Scottish and Southern Energy (SSE) have been cautious about agreeing to the MHP projects proposed, and they would require two levels of study before any renewable energy generation could be connected to the grid:

a) Initiation of a budget offer for the grid works (fee to SSE £ 1,000 to £ 5,000, deducted from total bill later).

b) If formal offer taken up, depending on the requested capacity, possible requirement for a Statement of Works from National Grid (potentially £ 25,000, non refundable).

Without knowing whether the scheme will be an acceptable capacity on the grid obviously places some risk on the project moving ahead, but it is understood that CES is working on resolving the uncertainties with installation of micro-renewables in Shetland, and that this study should assume the optimum scheme design for SADA.

As a guide, it has been suggested by SSE that schemes below 25 kW will be more easily and cheaply connected as they can pass through the G83/1 Engineering Recommendations and there would not be a need for half-hourly monitoring.

As result of discussions concerning the impoundment at the end of the top race at the Mill, the gross head has been dropped from 4.1 m to 3.7 m. This will allow a 400 mm deep notch to be built into the dam in the future (on the request of the landowner upstream) thereby alleviating flood build up behind. This has resulted in the scheme being rated at a flow of 325 l/s, an increase from 285 l/s in Phase 2, which at a new lower head of 3.7 m will power up to 7.2 kW and (after all losses considered) generate 28,297 kWh per year.

With the higher flow requirement and slight reduction in head, the scheme will require larger top race channel, which has been estimated as a 750 mm deep trapezoidal section 97 m long. Having assessed in detail the excavation and concreting for the channel and the cost of a culvert to pass under the road next to the mill, the total cost has increased by over 3.5 times from that estimated in Phase 2 and is now at £ 28,000, comprising 31 % of the total capital cost.

The screening and spillway arrangements and their cost are all covered in the report along with estimations of the contractor's preliminaries and other costs such as powerhouse construction, project set-up, preparing and re-instating the site.

The turbines considered are a propeller (Kapellar), with generator vertically mounted and crossflow, horizontally mounted with similar diameters but different running speeds (the crossflow would require a 1:4 ratio gearbox or transmission drive to run a 4-pole 7.5 kWe generator). Having looked at prices for the two types of turbines from accredited suppliers, the crossflow from Ecowave Systems is the most cost effective for the site, being nearly 4 times cheaper the propeller turbine.

When all of the control system, cabling, grid connection, turbine installation and commissioning costs, as well as a budget for project management are considered, the total capital cost is put at £ 89,178, as shown in detail in Annex 8.

When the two options for grid connection are considered (that of wheeling straight to grid or supplying the mill itself), there is a large variations on the value of the scheme. The first would obtain the Feed-in Tariff of 19.9 p/kWh for all generation and 3 p/kWh for all exported to grid, making a total gross income of £ 6,480 per year. If 25,024 kWh of the electricity is consumed by Shetland Arts within the mill (likely to be the case), the value increases to £ 8,855 per year because of the value of the offset.

Operation and maintenance requirements and their costs are outlined, and a conservative figure of 14 % has be calculated (about £ 1,240 a year), without payment for any rental. It is understood from SADA that the co-operation of any landowners that the scheme would

affect can be sought. With a likely net income after O&M costs of £ 7,615, the Weisdale Mill MHP project could show a basic payback of 11.7 years, broadly similar to that reported in IT Power's Phase 2 report.

Advice has been given on the application process for seeking permission from the three main statutory bodies involved in licensing hydro power projects, the Scottish Environmental Protection Agency (SEPA), Scottish Natural Heritage (SHN) and the local planning authority, Shetland Islands Council.

An indicative scheduling explains that with all the various permissions to obtain, the tendering and awarding procedures, lead-time for turbine and construction time, the project will take at least 20 months to realise, from a decision by SADA to move forward on the technical suggestions in this report.

2. Background

2.1 Work to date

From February to May 2010 IT Power undertook Phases 1 and 2 of the Shetland and Western Isles Micro-hydro Feasibility Study which reported for a total of eleven (11) sites in Shetland, six (6) of which were deemed as viable. The following aspects were covered in the Phase 2 report in June 2010:

- Site visits conducted and potential for development of micro-hydro power (MHP)
- Plotting catchment maps
- Head, flow and energy estimations
- Initial capital costings
- Grid connection
- Abstraction and fish protection issues
- Visual impact
- Operation and maintenance
- Financial Assessment and Funding

It was noted that in the design of the schemes assumptions had to be made, placing limitations on the accuracy of the energy and costing estimations. However, from the six (6) schemes short-listed, three (3) are now being developed further under Phase 3 and 4 of the feasibility study:

1. Eelawater – Northmavine Community Development Company
2. Twa Roes – Northmavine Community Development Company
3. Weisdale Mill – Shetland Arts Development Agency

In summary, for the scheme at Weisdale Mill, the key project parameters were established as:

- Catchment area = 12.156 km^2

- Rated flow = 285 l/s
- Gross head = 4.1 m
- Rated power = 8.6 kW
- Intake NGR = HU 396 532
- Top race length = 100 m
- Penstock length = 600 mm
- Powerhouse NGR = HU 395 531
- Energy capture per year = 29,324 kWh
- Estimated project cost = £72,919
- Project value per year = £ 5,836
- Initial (basic) payback = 12.5 years

2.2 Maps

The catchment map drawn up for the Burn of Weisdale confirmed that the flow duration curve can be the same as that from the gauging station at Weisdale, the only one on Shetland. This map has been used to check the flow analysis and also for guiding the design and layout of the scheme.

A larger scale map is given in Annex 1 which shows the location of the scheme in relation to the nearest main roads and population centres.

2.3 Grid connection

Having discussed with Scottish and Southern Energy (SSE) the best means to connect micro-generation projects to the Shetland grid, it is clear that the process is complicated by the fact that the Shetlands is an isolated grid with no interconnector that can only support a certain amount of variable (i.e. renewable) generation.

A recent study by Clyde University on grid stability issues indicated that no more than 30% of the islands demand could be from renewables. At present the Shetland electricity system is not connected to the electricity network on the mainland. The Islands are currently supplied by a 67MW power station at Lerwick (constructed in 1953) and by some electricity generated at the Sullom Voe oil terminal (70 MW) and the existing Burradale wind farm (3.68 MW), so there would appear to be capacity for renewables.

However, the grid lines are operating at a high demand because of the old infrastructure and the ability of wheeling renewable generation into the grid is constrained. Also, there is at least 600 MW of wind power planned for Shetland (the Viking wind farm) although this would require the provision of an undersea cable by Scottish Hydro-Electric Transmission Ltd which needs Ofgem to approve the necessary investment. It is not clear whether the large investment is forthcoming, so Scottish and Southern Energy (SSE) will remain cautious about any applications for renewable energy in Shetland.

Communication has been had with the relevant person at SSE/Scottish Hydro Electric Power Distribution (SHEPD) indicating that to start the process of properly assessing the 3 sites in Shetland, an amount of £ 1,000 to £ 5,000 will be needed to initiate a budget offer for the grid works (deducted from total bill later). If a formal offer is taken up with SSE, and depending on the requested capacity on the grid, there may be a requirement to request a Statement of Works from National Grid (£ 25,000 potentially) in order to identify any impact on the Transmission Network. Annex 2 details the process.

These amounts are large for small-scale renewable and place a risk on the next stages of the project going ahead as findings from the National Grid study would then have to be catered for within the project, potentially affecting the finalised design and how the development subsequently moves forward. However, for the purposes of this phase of feasibility, following guidance from Community Energy Scotland, it is assumed that the optimum power can be accommodated by the grid and that the SSE budget offer fee and National Grid study fee can be borne by the project.

Following discussions with SSE network planners, the grid connection of the Weisdale Mill scheme has not been deemed as unfeasible, but it is suggested that the maximum capacity is set at 25 kW as this is the diminimus amount and above this there is a requirement for half-hourly metering at extra cost.

3. Hydrological and energy capture refinement

3.1 Verification of gauging data

The main work within Phase 3 of the feasibility study is refinement of the schemes that emerged as most viable from Phase 2. The start of this process is to check the hydrological characteristics of the catchment area. This has been carried by generating the flow duration curve for the Burn of Weisdale gauging station.

The data for the Weisdale gauging station is given in Annex 3 and the following are its main attributes:

- Catchment Area = 12.156 km^2
- Lake Area = na
- Rainfall run-off per annum = 934 mm
- Mean flow (Q_{mean}) = 360 l/s
- Flow exceeded for 95% of the time (Q_{95}) = 48 l/s
- Q_{95} / Q_{mean} ratio[1] = 0.133

The most important output from this analysis is the Flow Duration Curve (FDC), giving the flows expected at the various exceedence points as shown in Annex 3 and Figure 1.

[1] If this ratio is <0.1, it indicates a flashy river, between 0.1 and 0.2 indicates a normal flow pattern and >0.2 indicates a river with high baseflow (such as a spring or bog).

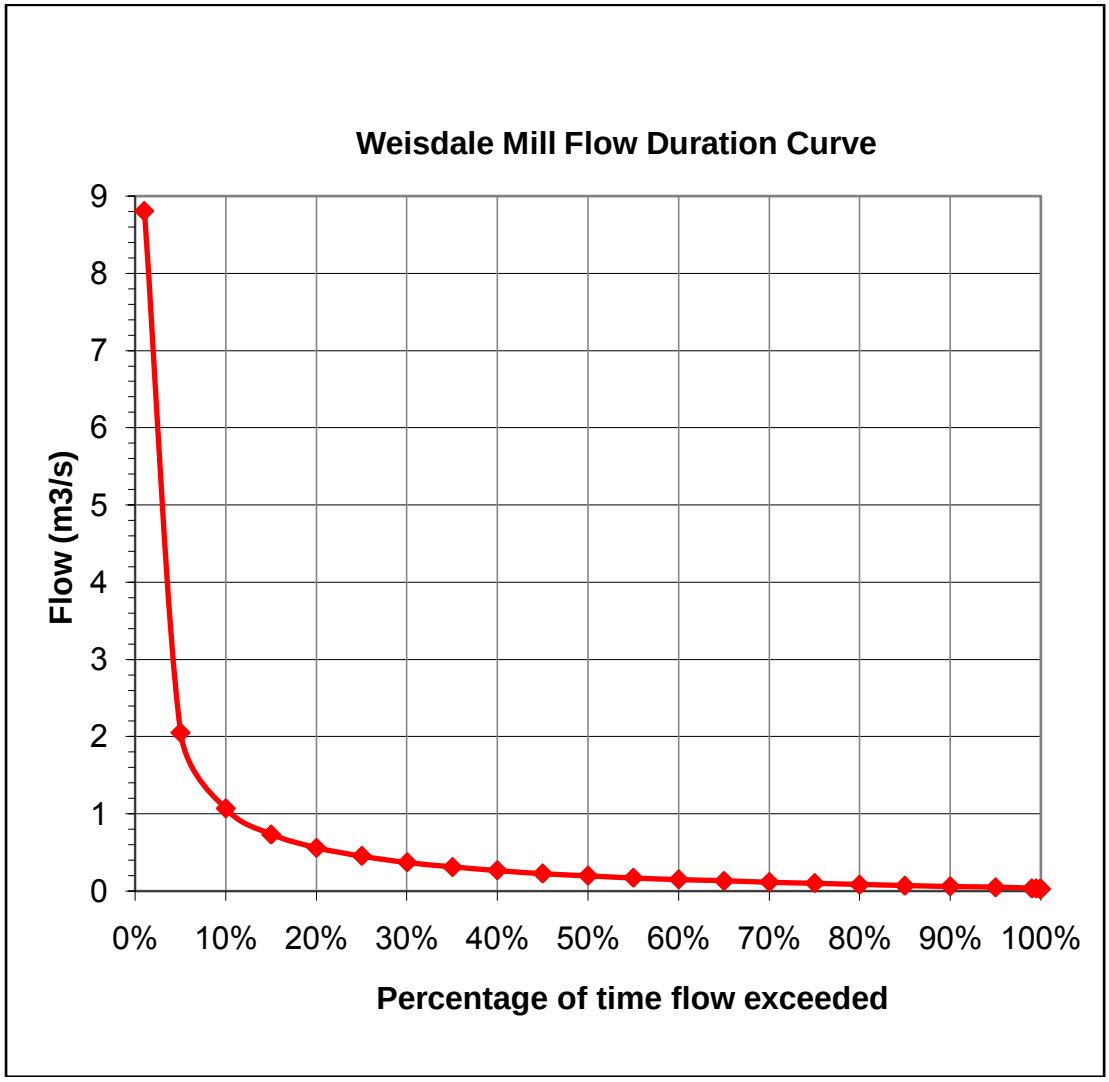


Figure 1 – Finalised FDC for Weisdale Mill

3.2 Rated turbine flow, hands-off-flow and energy capture analysis

The exceedence points can then be used to select the rated flow for a turbine (which should be less than Q_{mean}) and the Hands Off Flow (HOF) (the amount of water always left in the river and not delivered to the turbine). A spreadsheet model has been prepared to show how this turbine generates energy through a typical year considering the new flow analysis.

Other key parameters to model are hydraulic losses in the intake, screen and penstock pipe (which can reduce gross head by up to 8%), turbine efficiency across a range of flows, gearbox and generator losses and any maintenance downtime.

The designs used for the Weisdale Mil project were:

- Rated flow = 325 l/s
- Hands off flow = 48 l/s (Q_{95}) + 33 l/s for the fish hatchery (2,000 litres per minute)
- Intake screen = 2 m wide x 0.5 m deep x 75 deg. to horizontal

- Screen bar spacing = 10 mm
- Turbine maximum efficiency = 82 % (crossflow)
- Transmission drive maximum efficiency = 90.3 %
- Generator maximum efficiency = 96.2 %
- Maintenance downtime = 7 days (2%)

The resulting energy capture calculations are shown in Annex 4, giving the refined results for the Weisdale Mill scheme:

- Maximum power = 7.21 kW
- Rated generator power = 7.5 kWe
- Max. amperage = 31.4 A
- Annual energy capture = 28,297 kWh
- Overall system efficiency = 61.2 %
- Capacity factor = 44.8 % (percentage of time running at max power)

The scheme does not have to be fixed to these parameters because turbines are designed for the actual site and flows presented and rated power is therefore flexible. However, at this stage the above design has been determined as the optimum for the Weisdale Mill project given the site as presented with its location, access and grid connection aspects.

3.3 Initial valuation from FITS

Based on the new pricing regime for micro-generation, the Feed-in-Tariffs (FITS) which were introduced in April 2010, this scheme would be able to generate energy at a FIT rate of 19.9 p/kWh and potentially export some of the electricity to the grid at a further 3 p/kWh (see Annex 5).

This would provide a gross income of £ 6,480 per year.

4. Civil and turbine designs

The main parts of a micro-hydro scheme have explained in the Phase 2 report, however for the Weisdale Mill MHP, as a low head scheme, the following figure shows the specific components required.

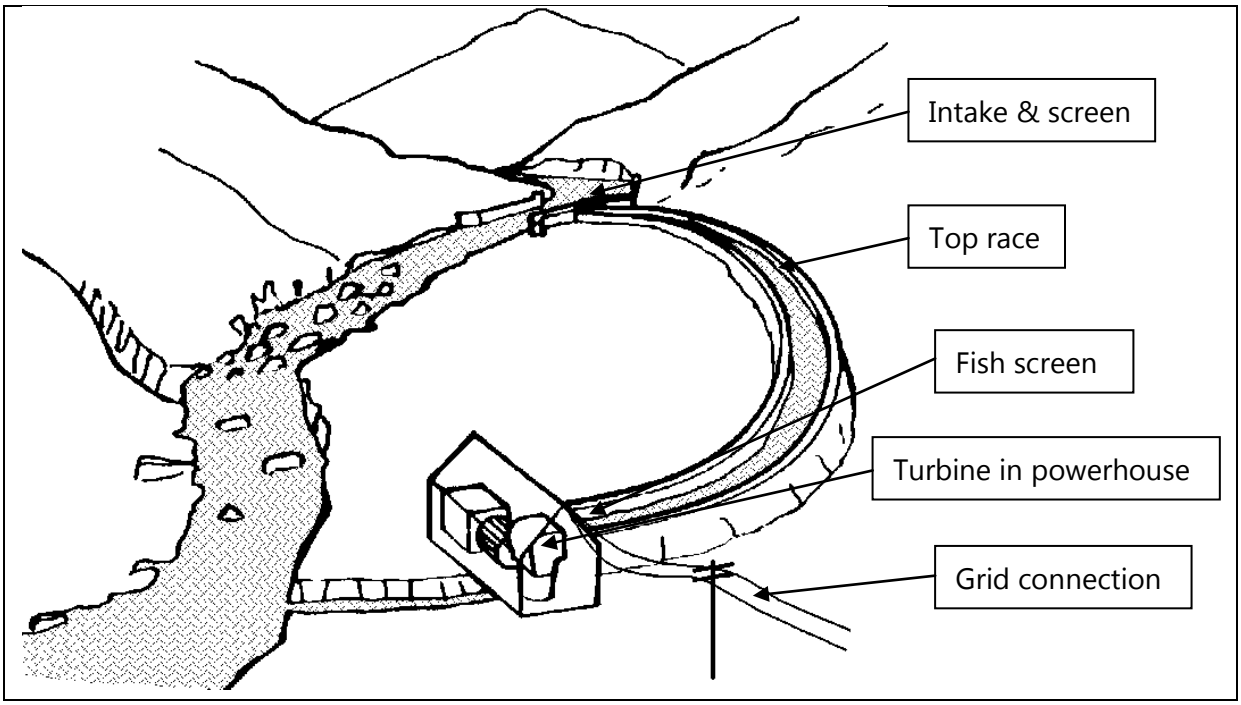


Figure 2 – Low head MHP with top race and screening

The rated flow for the scheme has been increased from 285 l/s to 325 l/s, so the civil infrastructure to provide water from the intake to the turbine (through a top race) has increased slightly as a consequence. The gross head has been re-evaluated as 3.7 m on request of the land owner upstream to allow a 400 mm deep notch to be built into the dam in the future thereby alleviating flood build up behind, but this does not change the proposed layout significantly.

The major components of this scheme are presented in the following sections, with reference to

Figure 3.

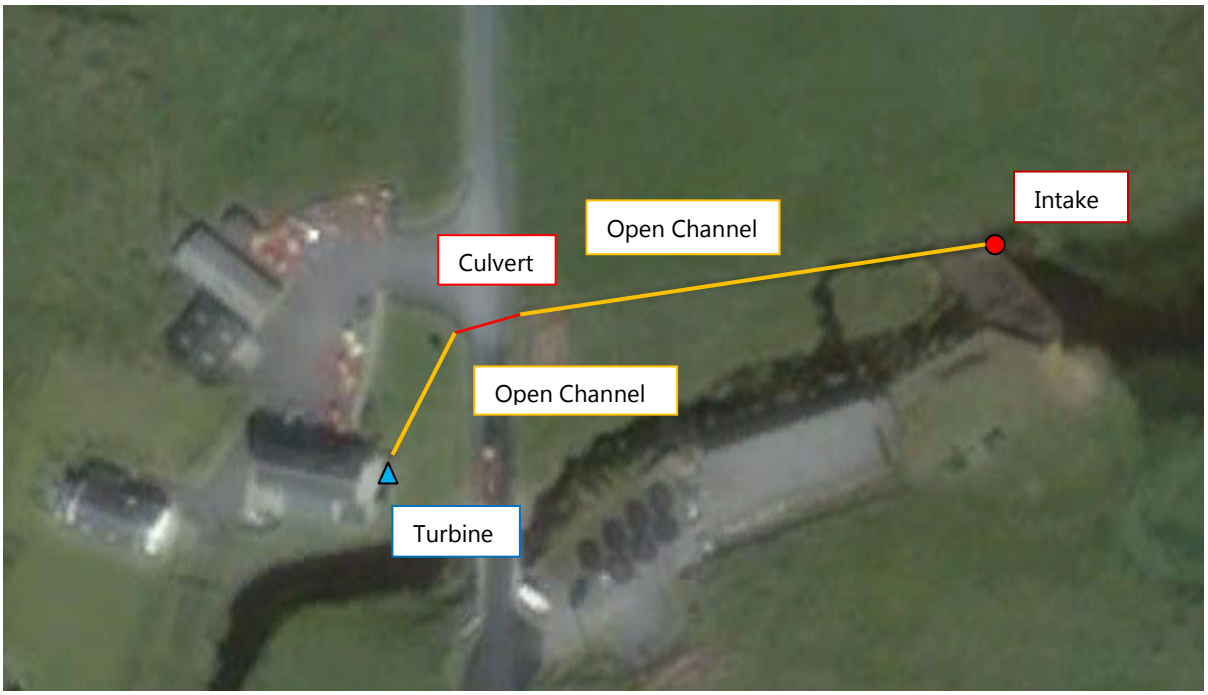


Figure 3 – Scheme overview for Weisdale Mill

4.1 Intake

The intake area as marked in **Error! Reference source not found.** with rough dimensions of 2 m wide x 0.5 m deep and 2 m long will be created with concrete walls to the side of the weir, leading to an angled fish screen to keep fish (and debris) from entering the top race. The estimate for amount of shuttering is 3 m^2, with 1.95 m^3 of re-inforced concreting, including a bottom skirt.

The intake may benefit from having a simple trash boom which keeps large debris from clogging the intake screen (which can be a floating tethered set of railway sleepers as in Figure 4).

Figure 4 – Example of simple trash boom

4.2 Top race and forebay

The 97 m long top race channel will be rebuilt into place it used to be and allowed to drop 75 mm to reach the mill. In order to allow an appropriate water velocity of 0.325 m/s through the channel (against which fish can swim if they need to reach the top race intake), a trapezoidal section will be formed with dimensions as shown in Figure 5.

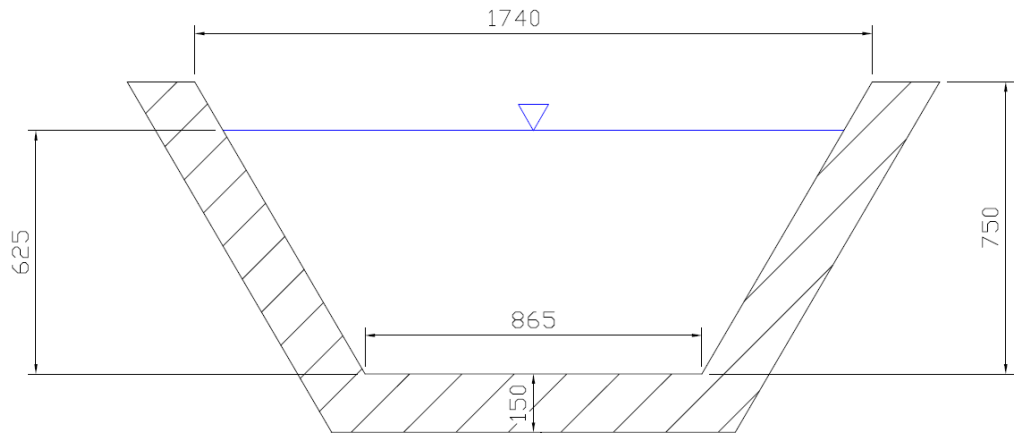


Figure 5 – Cross-section of proposed top race

The construction of the channel will require the excavation of 136 m^3 of soil the formation of 145.5 m^2 of shuttering to allow 150mm thick concrete to be poured with 39.5 m^3 of ready-mix concrete.

At one point the channel will have to cross the small access road, for which an amount will have to be budgeted for a culvert under the road.

At the end of the top race will be a small forebay tank to allow silt built up in the top race to settle out and further screen the water before it enters the turbine intake. The screen has been sized at 10 mm bar spacings, which for a low head scheme is appropriate but will need discussion with SEPA. An example of a fine screen is shown in Figure 6.

Figure 6 - Example of small-scale hydro intake screen

The forebay may need to have a spillway for when turbine inlet valve closes down, yet water is still being supplied from the top race. This could be accommodated by a simple (relatively small) channel alongside the powerhouse that is activated by the control system there and spills excess water straight back to the river.

4.3 Turbine

At the end of the top race will be a small intake with further screening to supply the turbine itself. For the Weisdale Mill scheme, due to the relatively low head of 3.7 m the appropriate turbine would either be a crossflow or propellor machine, neatly located within the old wheelpit (Figure 7). A hydrodynamic screw turbine could be considered at this head but given the limitations on fitting the scheme into the narrow wheelpit, without major alteration to the fabric of the building, development of a large turbine such as a screw (likely to be 1,100 mm wide plus civil works of a further 700 mm wide) would be difficult. This turbine would also require a structural assessment due to its considerable weight (over 3 tonnes) and impact on the building foundations and a noise assessment due to its more open design.

Examples of the appropriate size of crossflow and propeller turbines are given in Figure 8. The crossflow is a simpler construction and therefore cheaper but has a maximum efficiency of about 82%. For the propeller turbine, at this scale the most likely function would be to have fixed runner blades (4 pieces) similar to a ship's propeller, then adjustable guide vanes at the turbine intake to regulate flow. This turbine (called a Kapellar) is more efficient (over

92% at best) but will be considerably more expensive and will not operate down to as low flows as the crossflow.

Figure 7 – View of the back of the proposed powerhouse

Crossflow turbine

Propellor (Kapellar) turbine

Figure 8 – Examples of turbines for Weisdale Mill

Due to the accreditation now required of products to qualify for the Feed-in Tariffs, the two suppliers that could supply the turbines are given in Table 1 with detailed efficiency charts in Annex 6.

The diameter and speed of the runners would be as described below. Because of the relatively slow speed attained for the crossflow there would be a requirement for a gearbox or transmission belts so that a regular 4 pole (1,500 rpm) generator can be selected. For the propeller, due to its relatively small diameter, the speed attained could be used directly to a 6-pole generator. The generator can be mounted either vertically (for the Kapellar), or horizontally as shown below for a similar sized project in Northern Ireland.

Table 1 – Turbine options

Turbine type	Crossflow	Propellor (Kapellar)
Turbine make	Bluestream	GEE 240
Turbine supplier	Ecowave Systems	NHT Engineering
Runner diameter	200 mm (1,000 mm width)	320 mm
Runner speed	379 rpm	1,000 rpm
Gearbox	Ratio 1:4	None
Generator	4 pole 1,500 rpm	6 pole 1,000 rpm

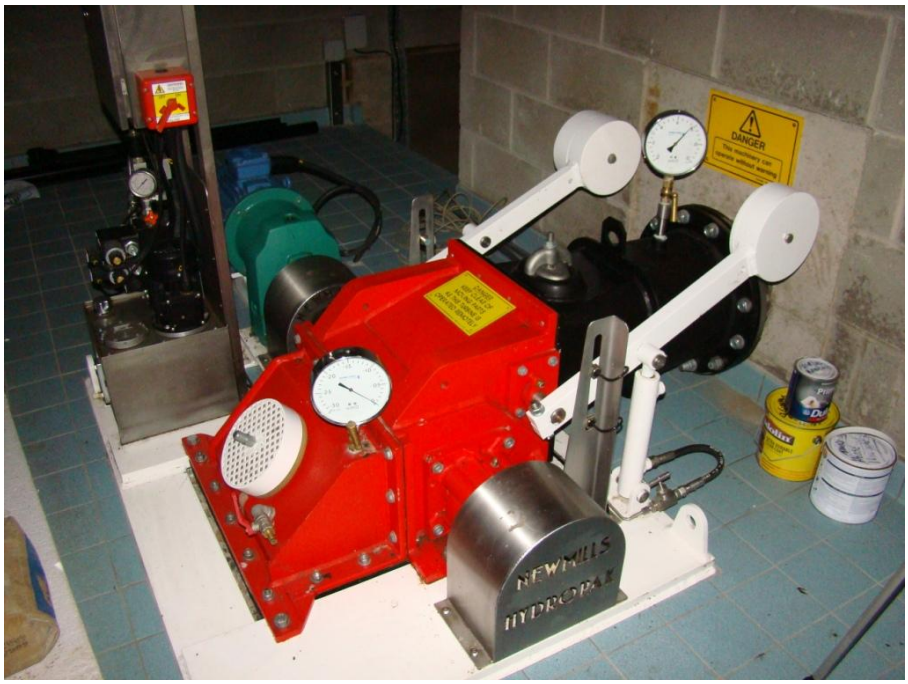


Figure 9 – Turbine arrangement

4.4 Generator and Controller

The control panel can be designed for single phase due to the limitations of supply of 3-phase electricity to the mill, although the single-phase option is 40% more expensive due to the lower availability of singe-phase generators. The generator and controller can be supplied as a standardised product from Sustainable Control Systems, and mounted in the powerhouse as a simple electrical control box as in Figure 10.

Figure 10 – Example of control system inside a powerhouse

4.5 Powerhouse

The powerhouse for this micro-hydro scheme will have to make use of the existing structure at the end of the mill, but need not be complex. A simple roof cover in keeping with the building which contains the turbine and control panel and other ancillary parts, with any sound proofing inside as necessary would suffice. An example of a stone built powerhouse above a screw turbine in Derbyshire is shown for reference below.

Figure 11 – Example of traditional powerhouse

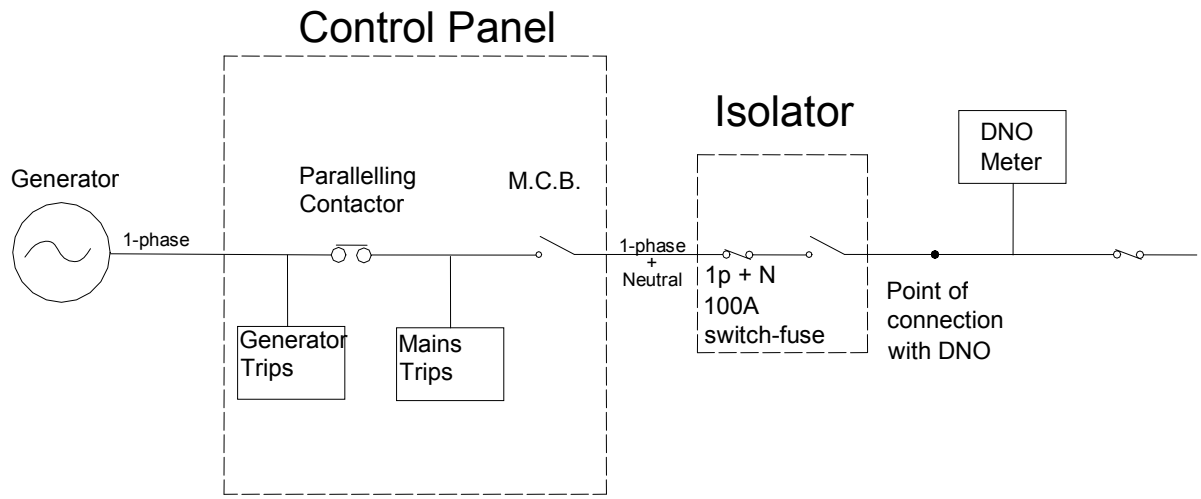
If there is a particular planning requirement for the powerhouse, this would need to be considered in the design at the appropriate time, but the costing assumptions are based on a reasonable build quality.

4.6 Grid connection cabling

The cabling to link up to the grid at Weisdale Mill would be relatively simple for the short run to the building's distribution board (Figure 12) but because the limit for G-83 regulations at single-phase is 16 Amps (3.68 kW), the 7.5 kWe generator would most likely have to be connected under the G-59 Engineering Recommendations, with a small extra cost.

Figure 12 – Weisdale Mill DB

At the meter end of the cable, where the system meets the grid, there would be the necessary isolators and fuses, to a single-line diagram similar to that below. An example of the metering required is shown in Figure 13.



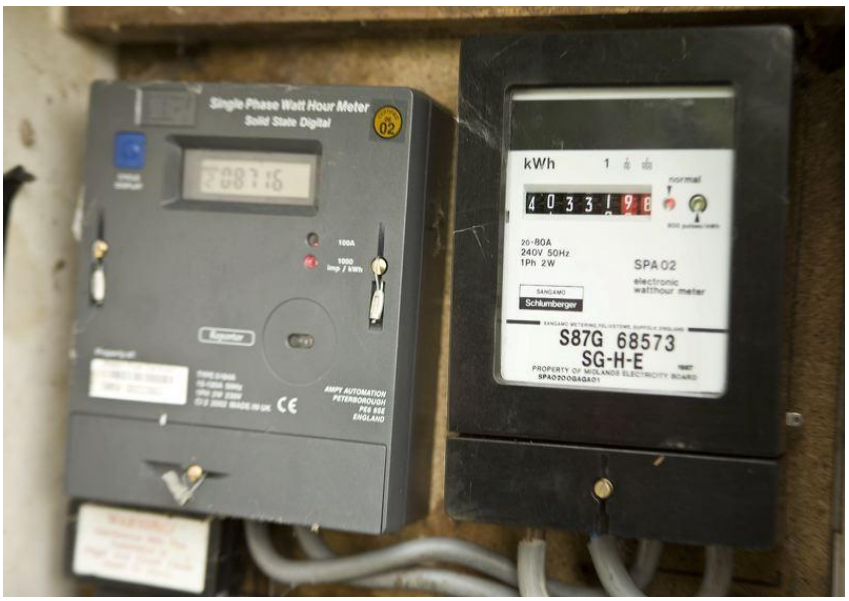


Figure 13 – Total generation meter next to residential supply meter

4.7 Plan and elevation drawings

Outline plan and side elevation drawings of the turbine within the powerhouse are enclosed with this report, in Annex 7. These can be used for initial applications to the Scottish Environmental Protection Agency (SEPA) and the local planning authority (LPA) to start the licensing process.

5. Project costs

5.1 Cost assumptions

In order to cost the civil works elements, standard industry pricings have been used as in Table 2. Contact has been made with a local civil engineering firm, Tulloch Developments Ltd. (www.tullochdev.co.uk) to test these assumptions.

Table 2 – Civil unit costs

Cost element	Unit	Unit cost
Coffer damming – sheet piling	m^2	£ 100
Excavations in normal ground	m^3	£ 20
Removal of spoil	m^3	£ 10
Shuttering for concrete pour	m^2	£ 50
Re-bar setting	m^2	£ 60
Ready mix concrete to site	m^3	£ 140
Backfilling spoil	m^3	£ 20
Pre-cast concrete slabs (200mm)	m^3	£ 125

Further to these pricings, other costing assumptions are:

- Site investigations – to fully survey intake or route of top race, including borehole testing @ £ 3,000 - £ 4,000.
- Prior to civil works contract, site set up (welfare, plant pound and temporary access) and site preparation work @ £ 4,000 - £ 6,000, depending on the size of scheme.
- Equipment hire @ £ 400/day for large land drills, diggers, loaders, jack hammers and specialist tools.
- Dewatering @ £ 200/day for maintaining dry any part of the site with excavation in the river.
- Powerhouse cost of £ 400 - £ 500 per square metre floor area.
- Safety fencing (to remain) @ £ 60/m.
- Any new bridge or culvert across a road estimated @ £ 8,000.
- Clearing up the site and re-instating the ground @ £ 2,000 – 4,000, depending on the size of scheme.
- Contingencies on civil costs @ 10%.

For the metalworks involved in the project, the following have been used as estimates based on experience from other MHP projects:

- Intake screen and control structure at top race – £ 1,000
- 10 mm bar spacing fish screen and control structures at forebay - £ 1,500
- Short section of penstock pipe for intake to the turbine - £ 500

At this stage due to the uncertainty of connecting in the Shetland grid as well as the requirement for budget offer fees and Statement of Works for National Grid, there are no cost quotes for grid connection. Estimates have been made based on experience of grid upgrades undertaken for MHP projects elsewhere in the UK.

5.2 Installation methodology

As a guide, the following is a brief methodology for installation of the MHP project at Weisdale Mill.

- **Ground testing** – because the channel top race used to supply the mill wheel and is in part still runs with water, it is not required to carry out any ground testing as the ground is likely to be easily excavated. The cost of that excavation has been lowered by 10% compared to other schemes because of the likely ease of construction.
- **Site set-up** – the principal contractor (most likely a local civil engineering / groundswork company) will need to establish a project compound for storage of plant and provision of staff welfare and Health & Safety / CDM control. The site will also have to be cleared and prepared with reasonable access allowed to all components of the scheme. An amount of £ 4,000 has been budgeted for the total set-up and clearing up and making good at the end of the contract.
- **Intake** - works on the intake may have to be scheduled in winter months because of the impact on wildlife of concreting structures at the race intake and top weir in summer may be greater. SEPA will provide guidance on the preferred timing for any works in or near (i.e. within 8 m) from a river.
- **Channel and forebay** – the excavation, shuttering and concreting of the top race and small forebay tank at its end may be conducted more flexibly than works near the river, which will be important because the lead time for its construction may be longer than other components because of its length and the need to culvert under the access road.
- **Turbine** – due to the relatively small size of the crossflow turbine (preferred due to cost advantages over the propeller, being a total of £ 20,000 compared to over £70,000), it can be easily craned into the powerhouse area before the new roof is put on.
- **Powerhouse** – the work on the main powerhouse structure can be lead by the principal contractor, however, there will be a liaison required with the turbine supplier/installer (both of which have to be MCS accredited) for design of the turbine plinth and outfall area and civil structures that support the main inlet valve and adapter piece. The control systems and electric wall (air convection) heaters suitable for use of a turbine brake can be mounted on the powerhouse wall. Access to and into the powerhouse as well as any lifting beams required for the turbine/generator set will also have to be ensured.
- **Grid cabling and connection to grid** - the main (single-phase) cable (maximum diameter 30 mm) can be easily run along a convenient wall through trunking to the distribution board cupboard and the metering, fuses and isolators and connection of the system to the grid can be made there.
- **Commissioning** – after the infrastructure is built and turbine located on its plinth and connected to the grid, commissioning can take place by the accredited installer (a list of those accredited as of the date of the report is given in Annex 6). This should take between 2 - 4 days depending on the size and complexity of the scheme and is budgeted within the installation costs.

5.3 Cost table

The following table summarises the main cost elements for the Weisdale Mill MHP project, using the cost assumptions and sizing as presented above. This shows a 22% increase on the Phase 2 estimate and this is due to the larger flow required for a scheme with a lower head and a refinement process that has fully costed the infrastructure (e.g. culvert under the road).

Table 3 – Cost summary for Weisdale Mill

Gross head (m)	3.7	
Turbine rated flow (m3/s)	0.325	
Capacity (kW)	7.21	7.5 kWe generator
Site investigation & set-up cost	£ 4,000	4.5%
Intake & forebay cost	£3,648	4.1%
Penstock and top race cost	£27,923	31.3%
Turbine cost	£20,000	22.4%
Power-house cost	£4,000	4.5%
Control & grid cost	£6,000	6.7%
Installation and commissioning cost	£7,500	8.4%
Project Management cost	£8,000	9.0%
Contingency	£8,107	9.1%
Phase 3 Total	**£89,178**	**100%**

The figure for project management is based on local consultants assisting Shetland Arts Development Agency for the further technical preparations, discussions with SEPA and other bodies, preparation of licence applications, overseeing the tender and bidding process, then project managing the build, installation and hand-over phases. It could be that these tasks can be taken on by SADA in which case savings on the capital bill can be made.

The cost per kW for this scheme is £ 11,890, which compares to a figure of £ 8,400 from British Hydropower Association (BHA) research into schemes of this size (Figure 14) as is due to the long top race and large cost associated with this (~ £ 28,000).

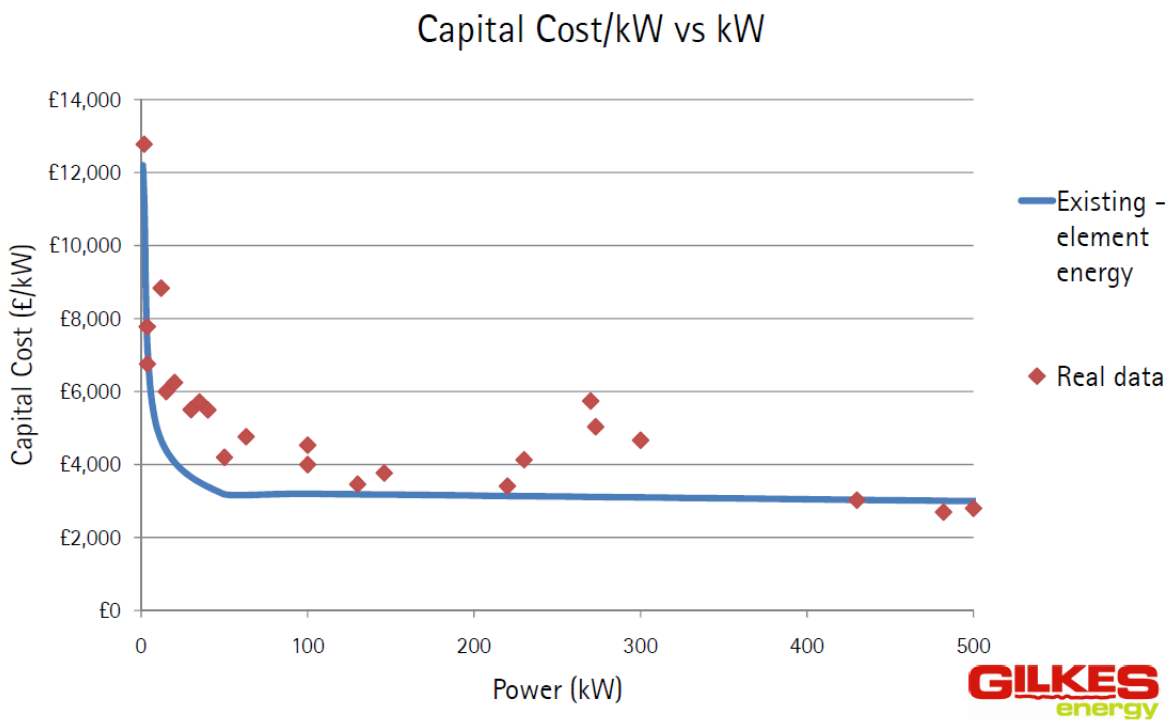


Figure 14 – Capex cost research carried out by Gilkes for BHA (2009)

The final cost will be subject to market testing and bids by a principal contractor and there may be price increases with inflation if the project takes some months to get to this stage. However, a large contingency has been allowed for and estimates have been carried out conservatively, so the cost will be somewhat future-proofed.

The detailed cost tables are given in Annex 8. Please note that VAT is not included, but the turbine and some ancillary components may only attract a VAT rate of 5%.

5.4 Maintenance schedules

Operation and maintenance (O&M) costs for small-scale hydro are not usually large but will need to be considered carefully in the income predictions for the scheme. The following are assumed as the O&M costs for the nature of the Weisdale Mill scheme and the impact of these on basic payback can be tested in section 7.2 later.

- There is already an allowance of 7 days downtime per year within the energy capture assessment for the scheme, which allows repair and maintenance to take place.
- Operator costs are often taken at £ 10-12/MWh generated per annum for small-scale hydro, giving a possible range of annual costs of £ 280 - 340 (say £ 30 a month for about half a day's work). The likely operator duties would be:
    - Checking any trash boom and operation of the fish screen and cleaning regularly especially in high flows when debris occurs.
    - Checking bearing greasing monthly.
    - Checking the sumps for ingress of flood water.
    - General technical appraisal of turbine operation and recording performance.

- Hydro turbine regular maintenance involves the replacement of bearings after 10 - 15 years and a full service at that time, for which an amount of £ 3,000 should be allowed for (or £ 200 - 300 per year).
- If the scheme has to pay rent on the site it uses for both the plant location and access to it, this is usually at 3-5% of gross income, but this has not been modelled as the indication is that the Shetland Arts Development Agency will be able to seek permission to use some land for construction of the scheme.
- There may be grid charges to pay, and these have been estimated at £ 60 - 90 per year.
- Wayleaves may be required for the cable runs back to the grid connection point at but as the cabling is likely to be internal to the mill this will not apply.
- Other costs may be insurances and legal costs, details of which will depend on the developer and nature of the final development, but an estimated £ 250 is allowed for this per year.
- As the scheme would be a micro-generation project run by a community group, it will not attract income or corporation taxes.
- The total O&M cost per year for the Weisdale Mill scheme is therefore put at between £ 790 and £ 980, which is potentially 12 % - 15 % of gross income. A sensible figure to take for financial modelling would therefore be 14 % **excluding any rental payments**.

6. Project scheduling

6.1 Key stages

The key stages in pursuing the Weisdale Mill MHP scheme are tabulated below, wherein about 20 months should be planned for to establish the scheme. This schedule may be affected by SEPA requirements (for example 6 months flow monitoring may be required), determination of applications may take longer than the statutory 4 months, and lead time for turbines may be more than the estimated 8 months shown in the table.

Key activity	Schedule (by month)
1. Full feasibility study with energy/revenue analysis and costings	0
2. Technical preparations for SEPA and LPA applications incl. discussions with statutory bodies (e.g. SNH) and other key stakeholders	1 - 2
3. SEPA and LPA applications submitted	3
4. Licence determination period	4 – 8
5. Tendering for principal contractor, turbine supplier and installer	9 – 10
6. Award of contracts and start construction (season dependent)	11 - 12
7. Building of main infrastructure	13 - 16
8. Delivery of turbine and grid connection work	18 - 19
9. Commissioning and project sign off	20

6.2 SEPA, SNH and planning permission

In order for the Weisdale Mill MHP project to move forward as in the table above, the next step will be the preparation of applications for the **three** main statutory bodies; the Scottish Environmental Protection Agency (SEPA), North Region with local office in Lerwick[2] , Scottish Natural Heritage (SNH)[3] and local planning authority, in this case the Shetland Islands Council[4].

SEPA

There will be at least two applications to make to SEPA for permission to use water through a hydro-electric scheme:

a) Abstraction licence (for taking water out of a river even if it is returned lower down)

b) Impoundment licence (for construction within a river or up to 8 m from it, e.g. intake)

The full details of the application process are given in a SEPA document '*The Water Environment (Controlled Activities) (Scotland) Regulations 2005 (CAR) Guidance for Applicants on Supporting Information Requirements for Hydropower Applications - Working Draft*' which has been made available to Community Energy Scotland.

The costs involved for schemes less than 100 kW are a just a 'simple licence fee' for all abstractions and impounding works, which is currently £ 594 (see *www.sepa.org.uk/about_us/charging_schemes/current_charging_schemes.aspx*)

There are abstraction and impoundment licence forms to fill up and a requirement to attach design details and a narrative statement or supporting document of the proposed scheme. This should cover the hydrological studies of the catchment area, abstraction rates designed for, the outline design of the scheme and how it will be installed, how the water demand of the turbine will be varied through the seasons, how fish will accommodated around any intakes (for example by screening or allowing fish passage where required) and any post-installation monitoring planned.

Because of the importance of ensuring the turbine and its supporting infrastructure and the scheme's mitigation of impact on wildlife (particularly fish) have been properly designed, it is advisable to contact SEPA at the earliest opportunity after the scheme design boundary conditions have been set. This is why, as stated in section 3.2 the following have already been determined, based on what SEPA will expect of a hydro-power scheme operating alongside a small stream:

- Rated flow = 325 l/s, below river mean flow of 360 l/s
- Hands off flow = 48 l/s (estimated as Q_{95}) plus 33 l/s for the fish hatchery
- Intake screen design outlined with screen bar spacing of 10 mm

For larger schemes, SEPA may require further evidence that the mean flow and Flow Duration Curve are as presented, so flow monitoring may have to be conducted for at least 6 months,

[2] The Esplande, Lerwick, Shetland, ZE1 0LL - tel - 01595 696926
[3] Stewart Building, Alexandra Wharf, Lerwick, Shetland ZE1 0LL - tel - 01595 693345
[4] Town Hall, Upper Hillhead, Lerwick, Shetland, ZE1 0HB – tel – 01595 693535

in order for the abstractions to be agreed by them. However, given the fact that this scheme is beside the only gauging station in Shetland and setting its rated flow at below the river's mean flow, this is unlikely to be needed.

Because there would not be major impoundments involved with the Weisdale Mill MHP scheme (the intake would be a simple diversion from the weir at the top of the race) and it is not near major housing areas, there are unlikely to be flooding concerns that would require SADA to undertake a flood risk assessment for SEPA. There is a proforma form under Planning Policy Statement (PPS) 25 (Development and Flood Risk) that could be filled in as part of the application to the LPA.

The overview practical guide for Controlled Activities Regulation (CAR) of water resources in Scotland which may prove useful for background information is available on-line at *www.sepa.org.uk/water/water_regulation/car_application_forms.aspx*.

SNH

Scottish Natural Heritage is the independent government organisation responsible for implementing policy on the environment. Its stated aims include action to:

- safeguard and enhance Scotland's natural heritage, particularly its natural, genetic and scenic diversity.
- foster awareness and understanding of the natural heritage.
- promote enjoyment of, and responsible public access to, the natural heritage in ways which do not damage it.
- encourage public support and voluntary effort for the benefit of the environment.
- promote improvement of the natural heritage in and around towns and cities, where most of Scotland's people live.
- encourage environmental sustainability in all forms of economic activity.

SNH also designates and administers National Nature Reserves in Scotland of which there are three in Shetland. If the Weisdale Mill scheme is seen to impact on the natural heritage of the area, then discussions with SNH are advisable and mitigation measures can be put in place as part of the design process. Examples could be for the construction then visual impact of the long top race and above-ground penstock.

LPA

The local planning authority will require SEPA to have been consulted within the planning application for a MHP project, as well as Scottish Natural Heritage (SNH) on wildlife issues outside of those that SEPA deal with (e.g. aquatic mammals, birds, bats and plants). The LPA will then make determinations on the visual impacts of the project (particularly any pipeline and the powerhouse), any particular heritage or conservation issues and impacts on public footpaths or highways. As well as outline drawings of the proposed scheme, the LPA will have to approve plans for the construction phase, which will require work plans and details of demarked areas for construction plant and access to the various components of the site.

Broadly, the Shetland Islands Council favour renewable energy and have the following policies in place within their Structure Plan 2001 – 2011:

- On the island's Electricity Supply, it is stated under **Policy ENG SP2** that development proposals set out by the grid supplier, Scottish Hydroelectric (SHE), for improving future energy supply arrangements for Shetland (including a sub-sea grid connection to the Scottish mainland) will be considered favourably. This arrangement would allow small-scale renewable energy to be more easily connected.
- On Renewable Energy, because Shetland relies on oil and waste gas for 93% of its energy production it is recognised that this not sustainable, **Policy ENG SP3** encourages proposals for the generation of power from renewable energy sources.
- Within the Shetland Energy Plan (1998), which set out to encourage a more strategic and co-ordinated approach to energy management in Shetland, one objective is to maximise the use of local resources - including renewable technologies. **Policy ENG SP4** states that energy related developments which take into account the objectives and strategies set out in the Shetland Energy Plan and comply with environmental and other provisions of the Structure and Local Plan will be considered favourably.

7. Project performance

7.1 Income – gross and net

Straight grid connection

If the Weisdale Mill MHP project is a straight grid connected scheme made at 7.5 kW through an appropriate transformer outside the mill, the revenue is from the generation FIT and all exports sold to the grid. The annual income is therefore:

- Generation tariff = 28,297 kWh @ 19.9 p/kWh = £ 5,631.10
- Export tariff = 28,297 kWh @ 3 p/kWh = £ 848.91
- **Total income = £ 6,480**

If O&M costs at 14 % are considered, this would drop to about £ 5,572.

Grid connection through distribution board

However if the grid connection is made (as is most likely) through the mill's distribution board, then the electricity consumed there (showing on SADA bills amounting to 25,024 kWh from 11 July 2009 to 12 July 2010) can be supplied by the MHP for free, saving the cost of that electricity from the grid and this will provide extra revenue to the scheme.

From bills sent by SADA, the average price for electricity is 12.49 p/kWh, therefore the final annual income in this case will be:

- Generation tariff = 28,297 kWh @ 19.9 p/kWh = £ 5,631.10
- Export tariff = 28,297 – 25,024 kWh = 3,273 kWh @ 3 p/kWh = £ 98.19

- Savings from own consumption = 25,024 kWh @ 12.49 p/kWh = £ 3,125.50
- **Total gross income = £ 8,854.79**

In this case, if the same level of O&M costs are considered at 14 %, the income would drop to about £ 7,615, which is the figure that should be realistically taken for economic evaluations.

7.2 Economic performance

The capital cost for the Weisdale Mill MHP scheme has been estimated using civil quantity measurements and unit costings that have not been directly market tested together with known prices for electro-mechanical equipment but the costing assessments are regarded as cautious. In addition there is a 20% civil works mark-up to cover for principal contractors' costs as well as a 10% contingency on all costs. The costs as provided should suffice as a working budget for the Shetland Arts Development Agency, if the project is to go forward into the applications and licensing process, with the months that this process will take.

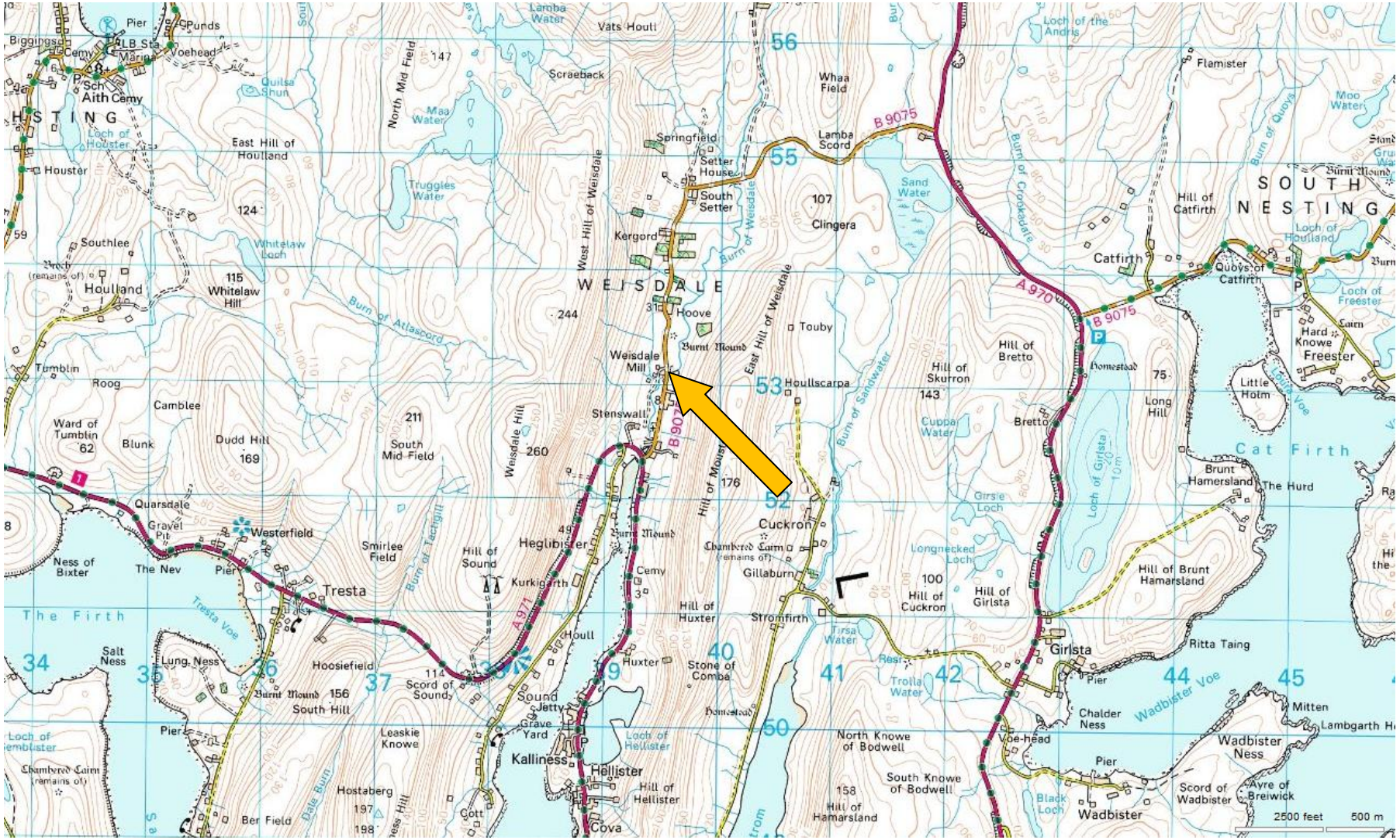
Overall the Weisdale Mill scheme displays the following basic payback on the options offered for grid connection, **not including any rentals that may be required**. This is not an economic payback in that it does not include for any borrowing that the Shetland Arts Development Agency may have to make to develop the scheme. It is outside the remit of this study to financially model the project and there may indeed be grant funding available to it, details of which have been given in IT Power's Phase 2 report.

Table 4 – Basic economic performance for Weisdale Mill MHP

Grid connection option	Straight to grid	Through mill
Capital cost	£ 89,178	£ 89,178
Annual gross revenue	£ 6,480	£ 8,855
O&M costs	£ 908	£ 1,240
Net annual revenue	£ 5,572	£ 7,615
Basic payback	16 years	11.7 years

8. Annexes

8.1 Annex 1 - Location Map



8.2 Annex 2 - Grid connection

E-mail from Keiron Nicoll - SSE
24 Sep 2010

In response to your e-mail I can confirm that all generation (micro and larger) will require to go through National Grid's Statement of Works process (£8k and £17k). Due to the capacity issues on Shetland SHEPD would be unable to identify what would be required to connect your attached developments without either carrying out a budget feasibility or formal offer. As you are aware this will work will be dependent on what transmission work would be required.

Please see application process below

In order to identify what the costs and impact would likely be for a grid connection we would request you to initiate a grid connection application. I have provided details of the two application processes and the required information. If you have still to secure planning, procurement of plant/materials and any other studies I would suggest choosing the budget option otherwise the formal. Please complete and return the Generation Connection Application Form (available at :http://www.ssepd.co.uk/Sections/NewConnections/NewConnections.aspx)(if applicable) and all other documents/information to **mcc@sse.com**.

SHEPD will provide an Offer within three months of receiving a 'Competent Application'. In order to submit a 'Competent Application' you must submit the following:

Budget Offer - (Cost from £1k to £5k for a budget offer. This cost will be deducted from the overall costs should you go ahead with a formal offer)

- Location Map (displaying proposed connection point and/or Grid Reference)
- Proposed Connection date
- Range of Generation required (kW's/MW's)
- Type of Generation (Wind/Hydro) & Manufacturer (Enercon etc)
- Nominated party's name and address to receive the Budget Offer
- Invoicing party name and address

Formal Offer - (no cost involved, however contractual and financial obligations apply. See below)

- Completed Generation Connection Application Form
- Proposed Connection date
- Planning approval date or expected planning approval date
- A location map showing requested connection point, details of site boundary / land ownership boundary / Proposed site of Substation / Access road to Substation
- A letter of authority from the landowner, where applicable
- Type of Generation (Wind/Hydro) & Manufacturer (Enercon etc)
- Nominated party's name and address to receive the Formal Offer
- Invoicing party name and address
- Single Line Diagram (SLD)

I would like to make you aware of a number of contractual requirements when we offer you a formal connection agreement. See below -

- Payment of a deposit to the value of 25% of the connection costs on acceptance of the connection offer if connection costs are >£100k.
- Payment of 100% of the connection costs on acceptance of the connection offer if connection costs are <£100k.
- A requirement to connect within 3 years from the date the connection offer is signed.

- Further staged payments typically equivalent to a further 40 to 60 % of the connection costs 12 to 24 months after signing the connection offer.
- A requirement to enter into a Construction Adoption Agreement, typically 6 months after signing the connection offer if you decide to use an Independent Connection Provider (ICP) to carry out the contestable works.
- Depending on the requested capacity there may be a requirement to request a Statement of Works (SoW, £25k potentially) from National Grid. This would identify any impact on the Transmission Network.
- Underwriting the costs of any reinforcements on the transmission system (if required).
- Unconditionally accepting the terms and conditions of the new connections contract within 30 days of receiving the formal new connections offer.

*******************Please note it is important that you are explicit in your correspondence if your application request is for a Formal or Budget Offer***************************

Scottish and Southern Energy plc

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8.3 Annex 3 – Gauging Station data analysis

% exceedence	Q (m^3/s)
0.01%	87.761
0.05%	43.628
0.10%	34.102
0.50%	13.958
1.00%	8.808
5.00%	2.048
10.00%	1.069
15.00%	0.733
20.00%	0.56
25.00%	0.452
30.00%	0.37
35.00%	0.311
40.00%	0.265
45.00%	0.226
50.00%	0.198
55.00%	0.17
60.00%	0.148
65.00%	0.13
70.00%	0.114
75.00%	0.1
80.00%	0.085
85.00%	0.069
90.00%	0.058
95.00%	0.048
99.00%	0.034
99.50%	0.031
99.90%	0.028
99.95%	0.028
100.00%	0.026

8.4 Annex 4 - Energy capture spreadsheet

Weisdale Mill	Hydro energy calcs										
Shetland	(Shetland Arts)	Catchment (km2)	Hatchery flow (m3/s)	Hands Off flow (m3/s)	Mean	Rated flow (m3/s)	Gross head (m)	Intake diam (m)	Penstock length (m)	Power (kW)	Amps per phase
Powerhouse	HU 395 531	12.156	0.033	0.048	0.3600	0.325	3.7	0.6	na	7.21	31.37

Exceedence	Phase 1 Flow	GS Flow (m3/s)	River flow (m3/s)	Turbine flow (m3/s)	Trashrack loss (m)	Intake losses (m)	Net head (m)	Turbine eff.	Trans eff.	Gen. eff.	Elec. Power (kWe)	Energy (kWh)
0%	87.761	87.761	87.436	0.325	0.076	0.076	3.35	77.9%	90.2%	96.2%	7.21	632
1%	8.808	8.808	8.483	0.325	0.076	0.076	3.35	77.9%	90.2%	96.2%	7.21	2,528
5%	2.048	2.048	1.723	0.325	0.076	0.076	3.35	77.9%	90.2%	96.2%	7.21	3,160
10%	1.069	1.069	0.744	0.325	0.076	0.076	3.35	77.9%	90.2%	96.2%	7.21	3,160
15%	0.733	0.733	0.408	0.325	0.076	0.076	3.35	77.9%	90.2%	96.2%	7.21	3,160
20%	0.560	0.560	0.235	0.325	0.076	0.076	3.35	77.9%	90.2%	96.2%	7.21	3,160
25%	0.452	0.452	0.127	0.325	0.076	0.076	3.35	77.9%	90.2%	96.2%	7.21	3,020
30%	0.370	0.370	0.081	0.289	0.067	0.071	3.36	79.5%	90.3%	96.2%	6.58	2,603
35%	0.311	0.311	0.081	0.230	0.054	0.066	3.38	80.4%	90.3%	96.1%	5.31	2,109
40%	0.265	0.265	0.081	0.184	0.043	0.061	3.40	82.0%	90.2%	95.5%	4.32	1,685
45%	0.226	0.226	0.081	0.145	0.034	0.056	3.41	81.2%	90.2%	95.2%	3.37	1,317
50%	0.198	0.198	0.081	0.117	0.027	0.051	3.42	79.5%	90.0%	94.2%	2.64	991
55%	0.170	0.170	0.081	0.089	0.021	0.046	3.43	76.3%	89.5%	92.5%	1.89	683
60%	0.148	0.148	0.081	0.067	0.016	0.041	3.44	67.2%	89.0%	91.5%	1.23	468
65%	0.130	0.130	0.081	0.049	0.011	0.036	3.45	67.2%	89.0%	91.5%	0.90	198
70%	0.114	0.114	0.114	0.000	0.000	0	3.50	0%	0%	0%	0.00	0
75%	0.100	0.100	0.100	0.000	0.000	0	3.50	0%	0%	0%	0.00	0
80%	0.085	0.085	0.085	0.000	0.000	0	3.50	0%	0%	0%	0.00	0
85%	0.069	0.069	0.069	0.000	0.000	0	3.50	0%	0%	0%	0.00	0
90%	0.058	0.058	0.058	0.000	0.000	0	3.50	0%	0%	0%	0.00	0
95%	0.048	0.048	0.048	0.000	0.000	0	3.50	0%	0%	0%	0.00	0
99%	0.034	0.034	0.034	0.000	0.000	0	3.50	0%	0%	0%	0.00	0
100%	0.026	0.026	0.026	0.000	0.000	0	3.50	0%	0%	0%	0.00	

Turbine shut-down
0.039

	Total kWh per year	28,875
2.0%	with downtime kWh	28,297
	Capacity factor	44.8%
	Annual value	£6,480

8.5 Annex 5 - Feed-in Tariffs and the Government's Comprehensive Spending Review

The feed-in-tariff (FIT) was launched on the 1st April 2010 and provides a guaranteed income per kWh generated from a range of renewables for a set period (20 years for hydro). The amount paid per kWh is dependent upon the size of the hydro power scheme as highlighted in Table 5. The price paid per a kWh is also index linked i.e. will follow inflation.

Table 5 - Feed-in-tariff rate

Size of hydro scheme	Generation FIT paid per kWh in pence
≤15 kW	19.9
>15 - 100kW	17.8
>100kW - 2MW	11.0
>2kW - 5MW	4.5

In addition to the 'generation tariff' paid as above, the grid operators will pay an 'export tariff' for electricity sold to them, with a guide (floor) price of 3 p/kWh, making the price for the smallest (sub 15 kW) schemes at 22.9 p/kWh and the larger (above 15 kW) schemes at 20.8 p/kWh.

Statement from the British Hydro Association following the CSR

A Department of Energy and Climate Change (DECC) press release on the effect of the Government's comprehensive spending review (CSR) announced today has the following statement with regard to Feed-in Tariffs (FITs):

"Feed-In Tariffs will be refocused on the most cost-effective technologies saving £40 million in 2014-15. The changes will be implemented at the first scheduled review of tariffs unless higher than expected deployment requires an early review."

We have further consulted DECC today asking if a more precise definition of "cost effective technologies" could be supplied and where hydropower stood in the analysis.

The perceived view is that hydro is "cost-effective" and that a measure for this is the scale of FIT awarded at present in comparison with other technologies. Other factors will also be considered such as energy yield and longevity which should help the hydro case.

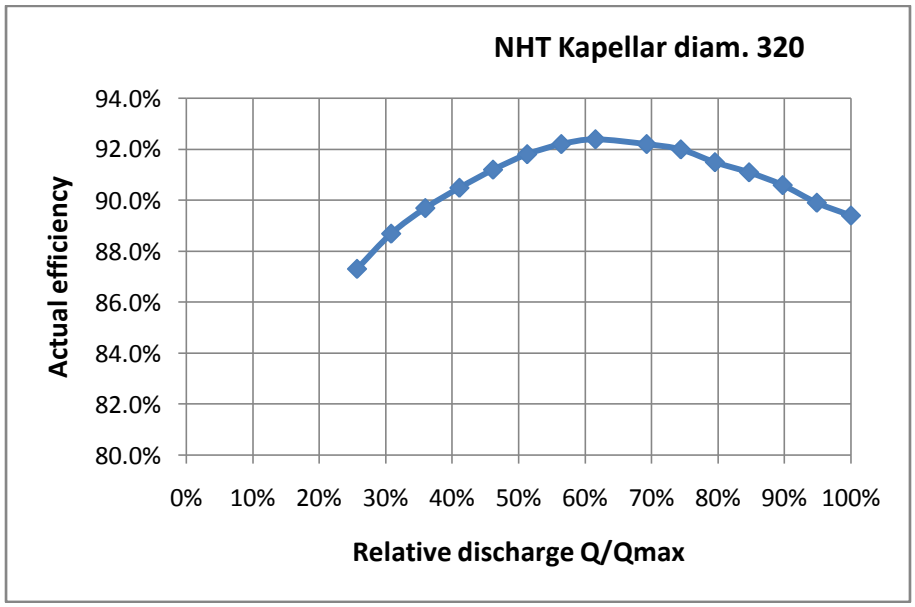
Regarding the CSR announcement, the BHA should be receiving an email from the Financial Incentives Team shortly. However from early feedback, the message is that there will be no change to FITs until after the planned review in 2012/13. The other good news is that there is also no change to ROCs for the present.

The (paraphrased) statement is:

"The key message is that there is a commitment to no changes to FITs before 2013, except under exceptional circumstances. Even after the review, if there are changes to tariff levels it will be no more than 20% overall, probably meaning less or nil for the more cost-effective technologies. We regard this as a successful outcome from the CSR process, since despite considerable pressure to cut all areas of Government spend, we have managed to preserve both FITs and ROCs in their current form at least until the planned reviews."

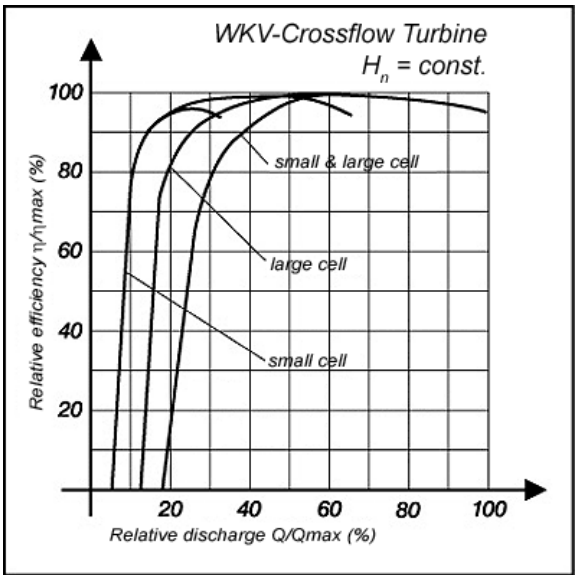
8.6 Annex 6 – Turbines efficiency and installers

1. Propellor



Q/Qmax	Eff.
100%	89.4%
90%	90.6%
80%	91.5%
70%	92.2%
60%	92.4%
50%	91.8%
40%	90.5%
30%	88.7%
25%	87.3%

2. Crossflow – large cell



Q/Qmax	Eff./Eff. max	Eff.
100%	95%	77.9%
90%	97%	79.5%
80%	98%	80.4%
70%	99%	81.2%
60%	100%	82.0%
50%	99%	81.2%
40%	97%	79.5%
30%	93%	76.3%
20%	82%	67.2%
15%	45%	36.9%

4. Accredited installers (as of end Oct 2010)

Company	Address	Contact	Date accredited
Boost Energy Systems Limited t/a Ampair	Park Farm, West End Lane, Warfield, Berkshire, RG42 5RH	David Sharman 0845 389 0660 www.ampair.com	pre 14/07/2009
Corin Hughes	3 Belle Vue Close, Stroud, Gloucestershire, GL5 1ND	Corin Hughes 07792 319313 www.corinhughes.co.uk	31/08/2010
Freeflow Hydro	Millbrook Works , Lower Horseley Fields, Wolverhampton, WV1 3DZ	 0844 357 3266 www.freeflowhydro.co.uk	31/08/2010
Highland Eco-Design Ltd	Keeper's Cottage, Persie Estate, Bridge of Cally, Blairgowrie, PH10 7LQ	James Wallace 07817 164533 www.highlandeco.com	17/09/2010
Potential Energy	Hewletts Mill, Galhampton, YEOVIL, BA22 7BG	Roger Hutton 07960 959003 www.potenergy.co.uk	24/09/2010
Renewables First Ltd	Wimberley Mill, Brimscombe, Stroud, GL5 2TH	Philip Davies 01453 887744 www.renewablesfirst.co.uk	pre 14/07/2009
Spaans Babcock Ltd	305 Phoenix Close, Heywood, Lancashire, OL10 2LG	Neil Hindle 01706 627 771 www.spaansbabcock.com	01/10/2010
Western Renewable Energy	Old Walls, Ponsworthy, DEVON, TQ13 7PN	Amy Thorne 01364 631126 www.westernrenew.co.uk	24/09/2010

8.7 Annex 7 – Drawings

8.8 Annex 8 – Detailed costs

Shetland and Western Isles Micro-hydro

Costs as at 02-Nov-10

	Site	Gross head (m)	Capacity (kW)	Turbine rated flow (m3/s)	No. Phases
1	Weisdale Mill (Shet)	3.7	7.21 (7.5 kWe)	0.325	1

Phase 2 Costs						
Turbine cost	Race & Penstock cost	Power-house cost	Control & grid cost	Install cost	PM cost	Phase 2 Total
£21,493	£7,500	£12,000	£5,359	£6,878	£19,689	£72,919

Shetland and Western Isles Micro-hydro

Costs as at 02-Nov-10

				Turbine 1 Costs									
	Site	**Gross head (m)**	**Capacity (kW)**	**Type**	**Make**	**Diam. (mm)**	**Width (mm)**	**Transm. ratio**	**Turbine cost**	**Gearbox / Trans. cost**	**Ancillaries / gates cost**	**Delivery cost**	**Turbine total cost**
1	Weisdale Mill (Shet)	3.7	7.21 (7.5 kWe)	Crossflow	Ecowave	200	1000	4:1	£16,000	£500	£1,500	£2,000	£20,000

Shetland and Western Isles Micro-hydro

Costs as at 02-Nov-10

	Site	Gross head (m)	Capacity (kW)	Race Costs					Penstock Costs			
				Length (m)	Depth of channel (m)	Excavation (m3)	Concreting (m3)	Race cost	Diameter (m)	Length (m)	Cost/m	Penstock cost
1	Weisdale Mill (Shet)	3.7	7.21 (7.5 kWe)	97	0.75	136.1	39.5	£ 16,884			£500	£500

Shetland and Western Isles Micro-hydro

Costs as at 02-Nov-10

				Phase 3 Costs									
	Site	**Gross head (m)**	**Capacity (kW)**	**Site inv. & set-up cost**	**Intake & forebay cost**	**Penstock and race cost**	**Turbine cost**	**Power-house cost**	**Control & grid cost**	**Install & commisi on cost**	**PM cost**	**Continge ncy**	**Phase 3 Total**
1	Weisdale Mill (Shet)	3.7	7.21 (7.5 kWe)	£4,000	£3,648	£27,923	£20,000	£4,000	£6,000	£7,500	£8,000	£8,107	£89,178

Shetland and Western Isles Micro-hydro

Costs as at 02-Nov-10

	Site	Gross head (m)	Capacity (kW)	Cost variance to Phase 2	Turbine 1 Results			
					Cost/kW	Energy (kWh)	Value per annum	Basic payback on value
1	Weisdale Mill (Shet)	3.7	7.21 (7.5 kWe)	122.3%	£11,890	28,297	£ 6,480	13.8