

Y Pwyllgor Amgylchedd a Chynaliadwyedd

Lleoliad:
Ystafell Bwyllgora 3 – Senedd

Dyddiad:
Dydd Iau, 1 Mawrth 2012

Amser:
13:30

Cynulliad
Cenedlaethol
Cymru

National
Assembly for
Wales



I gael rhagor o wybodaeth, cysylltwch â:

Alun Davidson
Clerc y Pwyllgor
029 2089 8639
ES.comm@wales.gov.uk

Agenda

1. Cyflwyniadau, ymddiheuriadau a dirprwyon

2. Ymchwiliad i bolisi ynni a chynllunio yng Nghymru – tystiolaeth ar ynni dŵr (13.30 – 14.30) (Tudalennau 1 – 6)

Dr Aonghus McNabola, Prosiect Hydro-BPT, Coleg y Drindod, Dulyn

E&S(4)-10-12 papur 1

Ewan Campbell-Lendrum, Infinis

E&S(4)-10-12 papur 2

Richard Rees, Rheolwr Gyfarwyddwr, Ynni Dŵr Gogledd Cymru

E&S(4)-10-12 papur 3



Towards a More Sustainable System of Water Supply in Ireland & Wales

- The HydroBPT Project commenced in May 2011 and is exploring the feasibility of Energy Recovery in the Irish & Welsh Water Industries using Micro-Hydropower (MHP) generation.
- The HydroBPT Project is a research collaboration between the Trinity College Dublin (Schools of Engineering & Business) and Bangor University (School of Environment, Natural Resources & Geography) and is part funded by the European Regional Development Fund (ERDF) through the Ireland–Wales Programme (INTERREG 4A).
- The water industry is the 4th most energy intensive industry in the United Kingdom, responsible for 5 million tonnes of CO₂ emissions annually. Globally, 2-3% of energy usage is reported to be associated with the production, distribution and treatment of water. The HydroBPT project aims to assist the water industry in the reduction of its energy consumption and CO₂ emissions.
- MHP generation is possible in water infrastructure where pressure becomes excessively high or where excess pressure is not required for the supply service.
- Examples of where energy recovery is possible without interfering in the supply service include at Pressure Reducing Values; Break Pressure Tanks, Service Reservoirs, Treatment works Outfalls, Inlet Works, Storm Storage Tanks.
- Energy is recoverable in the range of 5-300 kW depending on the flow and pressure available at particular sites.

- Examples exist at Varty Reservoir Ireland (90 kW energy recovery) or Esholt Waste Water Treatment Plant UK (180 kW energy recovery). Capital cost of investment is of the order of €3000-€6000 per kW.
- The objectives of the HydroBPT project include:
 1. Investigating the technical feasibility of Energy Recovery in the Water Industry: investigations to produce detailed design and implementation guidelines.
 2. Assessing the Environmental Impact of this new technology: Carbon-foot print, CO₂ emissions, life cycle analysis.
 3. Development of a GIS database of existing water infrastructure and their energy recovery potential for the Ireland-Wales region
 4. Development of a business/collaboration model for the implementation of Energy Recovery technology by industry stakeholders in practice.
- The HydroBPT project will conclude its work over the next 2 years and believe significant potential exists to improve the sustainability of the water industry in Ireland and Wales through the use of MHP energy recovery.
- The Water Industry contributes significantly to energy consumption and CO₂ emissions in society. Policy driven improvements in the energy efficiency of the process would be welcome.





Argymhelliad Ysgrifennedig i Bwyllgor Amgylchedd a Chymaliadwyedd Cynulliad Cenedlaethol Cymru Cyfarfod 1 Mawrth 2012

Datblygiad Pwer Hidro yng Nghymru

Y Taliadau Cylenwad Mewnol

Taliad cyflenwad mewnol (TCM) ydy polisi mecaneg yr Adran Egni a Newidiadau'r Hunsawdd (AENH) er mwyn annog datblygiad newydd pwer hidro trwy gydol Prydain Fawr. Mae'r Adran wedi sefydlu'r TCM ar lefel sydd wedi cynllunio i ildio buddran ddychweledig o 5 – 8% i gynlluniau pwer hidro newydd eu gosod.

Er mwyn cytuno ar lefel y TCM edrychodd yr Adran Egni a Newidiadau'r Hunsawdd yn ddyfal ar gost arianol cyfartaledd cynlluniau pwer hidro oedd yn gweithio ar hyn o bryd a chynnyrch trydan y cynlluniau hynny. Mae cynnyrch trydan yn dibynnu ar faint y dwr sydd wedi cael ei benodi i'w ddefnyddio yn y cynllun. Elfen bwysica model yr Adran Egni a Newidiadau'r Hunsawdd ydy'r agwedd tuag at ddefnyddio'r dwr.

Pryder Infinis ydy bod yr agwedd tuag at ddefnydd dwr a ddewiswyd gan Swyddfa yr Amgylchedd a Cyngor Cefngwlad Cymru yn wrthwynebol i fodol AENH. Mae hwn yn cyflwyno ansicrwydd na fydd datblygiadau pwer hidro awgrymiadol yng Nghymru yn medru cyrraedd buddran i fuddsoddwyr a ddisgwylywyd gan AENH er mwyn annog pwer hidro ychwanegol. Mae agwedd Cymru tuag at ddefnyddio dwr yn rhoi'r wlad mewn sefyllfa anfanteisiol i Lloegr a'r Alban er mwyn annog buddsoddion gwbl newydd.

Agwedd Cymru at ddefnyddio dwr er mwyn pwer hidro

Rhoddwyd yr enw "flow splitting" am y modd o ddefnyddio dwr, ar ddatblygiadau newydd pwer hidro yng Nghymru. Mae "flow splitting" yn lleihau cyfanswm y dwr ar gael tuag at gynlluniau pwer hidro yng Nghymru i'w cymharu a'r un fath o gynlluniau mewn mannau eraill ym Mhrydain Fawr.

Mae Infinis wedi modelu effaith syniad y "flow splitting" ar eu cynlluniau hidro presennol, addas yng Nghymru. Mae'r rhain wedi gweithio am lawer o flynyddoedd heb unrhyw effaith wrthwynebus ar yr amgylchedd. Os ddefnyddir y polisi "flow splitting" fe fyddai cynnyrch y trydan yn cael ei dorri i 50%. Mae hyn yn golygu bod "flow splitting" yn caniatáu defnyddio dim ond 40% - 60% o'r dwr gan gymharu a chynlluniau tebyg yn yr Alban neu yn Lloegr.

Mae Infinis yn haeru y buasai defnyddio "flow splitting" a phopeth sydd yn rhan ohono ar gyfer datblygiadau newydd pwer hidro yng Nghymru, yn rhoi'r cynlluniadau awgrymiadol mewn sefyllfa anymarferol. Yn iselhau'r posibilrwydd o gyfrifon i fuddsoddwyr i 2.5 – 4% mae "flow splitting". Oherwydd bod y cyfrifon yn hanner beth sydd ar gael mewn mannau eraill o Brydain, fe fydd Cymru yn colli'r cyfle o gael buddsoddion.



Bwriadwaith Hidro Infinis yng Nghymru

Mae Infinis yn gyfan gwbl yn cefnogi dyheadau Llywodraeth Cymru i drosglwyddo targedau egni adnewyddadwy ac gyda datblygiad mae pŵer hidro y posibilrwydd i chwarae rhan anigryw ynddo. O bob technoleg egni adnewyddadwy mae cyfranedd mwyaf ffyrdd cyflenwi pŵer hidro yn lleol. Pŵer hidro ydy'r peth gorau i ddod a manteision cymdeithasol, economaidd ac amgylcheddol i gymdeithasau lleol.

Mae Infinis yn awyddus i ddatblygu portffolio pŵer hidro ac ar hyn o bryd mae nifer arwyddocaol o leoedd wedi cael eu nodi'n fanwl fel lleoedd addas i ddatblygu. Mae Infinis yn gweithio ar y foment gyda tirfeddiannwyr i ddatblygu dros 5MW o gynhwysedd ychwanegol o pŵer hidro ar draws Cymru. Mae'r cynlluniau hyn wedi cael eu dewis yn benodol i leihau gwrthdrawiad gwrthwynebus ar yr amgylchedd. Buasai'r cynlluniau pŵer hidro hyn yn cario buddsoddiad oddeutu £30 miliwn yng Nghymru Gwledig. Yn ychwanegol mae manteision eraill i'r cynlluniau hyn. Fe fydd cymdeithasau gwledig ar wahan yn cael eu ymuno a'r grid cenedlaethol am y tro cyntaf, ynglyn a chefnogaeth arianol i gymdeithasau, tirfeddiannwyr ac elusennau.

Cefndir Infinis

Un o'r cwmnïoedd egni adnewyddadwy mwyaf ydy Infinis, yn gyson yn cynhyrchu dros 10% o bŵer adnewyddadwy Prydain. Mae Infinis yn perchen ac yn gweithredu 13.5MW o gynlluniau hidro yng Nghymru. Cymysgwch o ddwr cronfa ac afonydd ydy cynlluniau Infinis. Mae'r cynlluniau cronfa wedi eu lleoli yn Nyffryn Elan yng nghanolbarth Cymru, Llyn Brianne yn Ne Cymru a Llyn Celyn yn y Gogledd. Mae cynlluniau afonydd Infinis wedi eu lleoli yn Cwmorthin a Blaenau Ffestiniog yng Ngogledd Cymru.

Yn ychwanegol mae Infinis yn perchen ac yn gweithredu 16.85MW o bŵer gwynt yng Nghymru gyda ffermydd gwynt yn Rheidol ger Aberystwyth a Mynydd Clogau ger y Drenewydd. Yn derfynol mae Infinis yn berchen ac yn gweithredu cyfanswm o 23MW gorsafoedd adnewyddadwy trwy gydol De a Gogledd Cymru.

Mae Infinis yn benderfynol o gyrraedd safonau cymdeithasol ac amgylcheddol trwy gydol y busnes. Mae hyn wedi cael ei gydnabod yn gyson yn y „Sunday Times Best Green Companies Survey” ac yn derbyniad Infinis o wobr cyntaf CEEQUAL am Chynaliadwyedd a ansawdd amgylcheddol yn egni adnewyddadwy.



Written Submission to the National Assembly for Wales'
Environment and Sustainability Committee Meeting 1 March 2012

Background to North Wales Hydro Power

NWHP was created by Richard Rees in January 2011 with the aim of developing hydroelectric schemes with landowners rather than for them. Prior to this Richard worked for a National Land Agent developing schemes for landowners. Richard is a farmer's son and lives on the family farm in Abergele, North Wales.

It was apparent that due to the inherent risks and significant capital expenditure required for the development of a hydroelectric scheme that there were scores of schemes which weren't being developed across Wales and therefore there was a vast underutilisation of available resource.

By working with landowners we proactively look for hydro sites with strong potential across Wales and we then seek to work with a landowner and to share in the development risk so that a site which may otherwise have fallen by the wayside is brought into being.

This approach is very important for the wider rural economy as it promotes diversification on our farms and circulates money throughout the local rural economy not only through the construction and commissioning stages using local supply chains but for decades to come as the income from the schemes is held locally, sustaining rural jobs and promoting longevity and sustainability in the wider rural community.

The Feed-in-Tariff Policy

The introduction of the Feed-in-Tariff (FiT) is a National mechanism for the development of renewable energy schemes up to the 5MW level. Although the FiT allows for the development of schemes up to 5MW the majority of schemes are somewhat smaller than this. As at December 2011 the average size of the installed hydroelectric scheme under the FiT was circa 64kW.

The average scheme is therefore more akin to an on farm diversification project as they are in theory easier to consent and more financially achievable for a wider range of businesses.

The FiT rates were created having taken account of the expected costs of implementing the technology and from the predicted total returns. A severe and nationally important issue has therefore arisen as the predicted returns of a hydroelectric scheme in Wales are significantly lower in comparison to the returns which can be achieved in England and Scotland. This is due in the main part to the flow splitting policy adopted by Environment Agency Wales.

We are very concerned that hydro development in Wales is being unfairly treated in comparison to our other home nations and that Wales rural economy is going to be affected for generations to come by virtue of this legacy and our hill farms not benefitting from the rewards of this investment being made now.

Welsh Abstraction Regimes

The common policy in Wales for a high head HEP scheme is that the Q95 flow remains in the river as a 'hands off flow'. Over and above this level we are permitted to abstract a percentage of the

Pant Idda, Rhyd-y-Foel,
T: 07810 141052 E: richard@northwaleshydropower.co.uk
www.northwaleshydropower.co.uk



water. These percentages are commonly 50% for the months of April to December and 70% for the months of January to March. We are permitted to take up to a maximum flow of QMean (the average daily flow). On sites which are deemed to be even more sensitive to abstraction then these regimes fall to 40% and 60% or even 40% all year round which is disastrous in financial terms.

In the Lake District however it is agreeable to leave a larger hands off flow of perhaps Q85 and to take 100% of the water over this level and up to a figure of a multiple of QMean being as high as 1.8 times QMean. Please see an example below of a real potential scheme on a farm in Bala:

	Wales Rules	Wales Rules	England/Scotland Rules
Installed Capacity	97.6kW	97.6kW	97.6kW
Hands off Flow	Q95	Q95	Q85
Maximum Abstraction	QMean	QMean	QMean
Flow Regime	40:60 Flow Split	50:70 Flow Split	100%
Electricity Generated	206,900kWhrs	236,400kWhrs	308,900kWhrs
Income (PA)	£46,966	£53,662	£70,120
Loss of Income (PA)	£23,154	£16,458	N/A

The implications of this are twofold. The main issue is that as per the example above the **costs** of constructing the scheme in England or Scotland are **exactly the same** as they are in Wales however in Wales the scheme will generate much less electricity. This difference in income is not the difference between a more profitable scheme or a less profitable one it is the difference between a scheme being constructed and a scheme not being constructed. It is also important to remember that with a smaller scheme the results set out above would be exacerbated.

The other result is that in order to compensate for the lower returns due to the Welsh abstraction regime then schemes are downsized in order to benefit under the FiT. Therefore there are many schemes which could be between 150 and 350kW which are being brought down to 100kW in order to make them financially viable. This is magnifying the loss of income and also the inefficient use of available resource.

North Wales Hydro Power Projects

North Wales Hydro power generally specialise in schemes up to 100kW due to the above constraints. We are currently involved in one way or another with 61 potential or proposed hydroelectric schemes with an average installed capacity of 101.5kW. If the average cost of a 100kW hydro scheme is circa £600,000 and given the potential income as outlined above it is clear that the contribution of hydro power to the Welsh economy is significant and that we cannot afford to miss out on this opportunity and let investment fall away to England and Scotland.

We are one of the most enthusiastic and active developers of hydroelectric schemes across North and Mid Wales and we are fully supportive of the green economy and the benefits for our rural communities. We have a huge opportunity in Wales with our mountainous terrain and high rainfall to realise the great benefits which the hydro renaissance could bring to our economy and we are very excited about what the future could bring.

We appreciate that we need to protect our environment for future generations however we also appreciate that tourism is very strong in the National Park for example. Tourists come to the park as it is beautiful and it is kept beautiful by our farmers who are the day to day stewards of the land and the scenery. In order to have a truly sustainable and booming economy we need to ensure that we have a balance between our economy and our environment. After all hydropower is by its very nature an environmentally friendly industry and the most sustainable method of generating electricity.