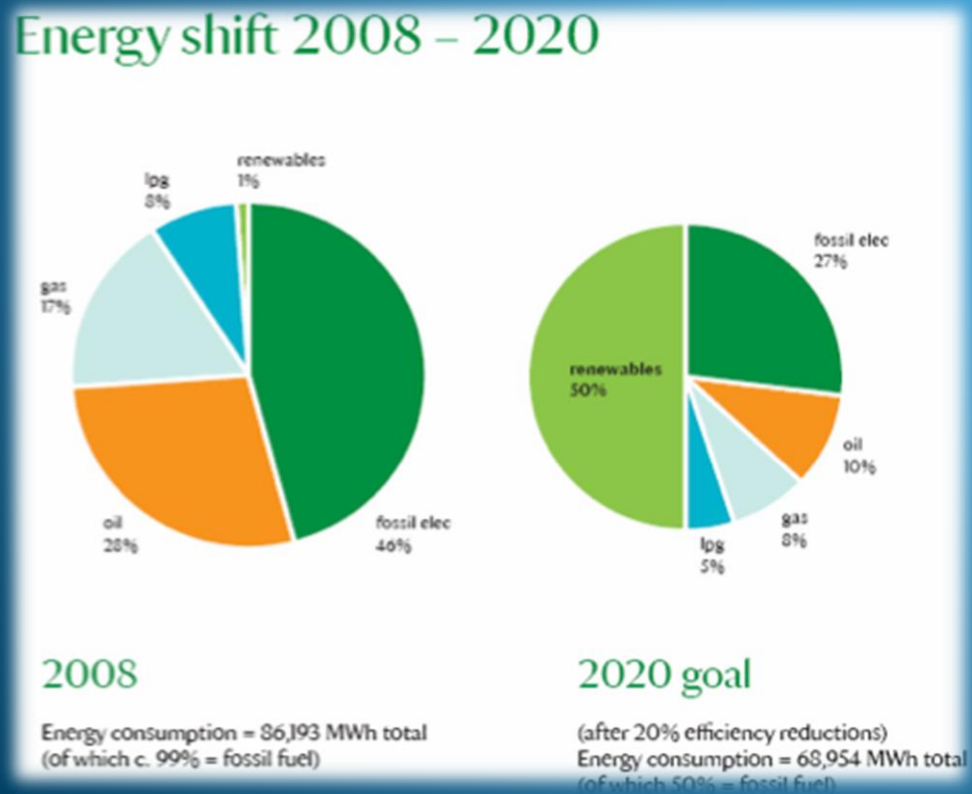
National Trust
'Grow Your Own' – an energy strategy for the future

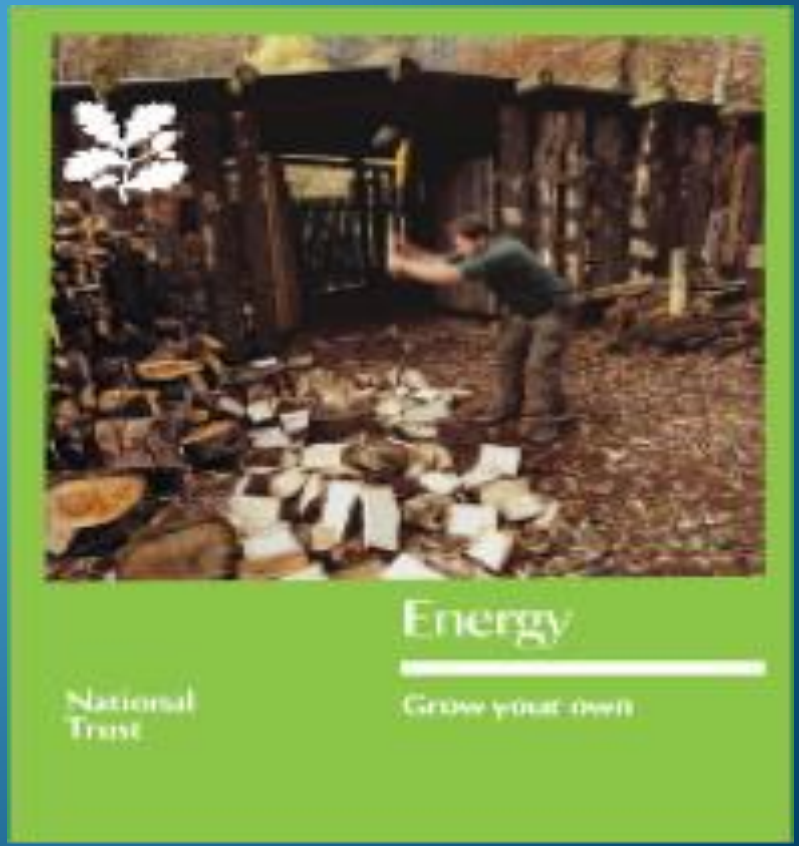
Garry Sharples
National Trust
Environmental Practices Adviser
North West Region

Presentation to APSE
Hydroelectric Power Event

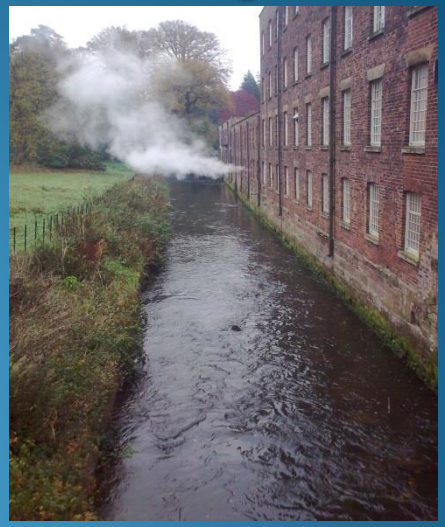
Wednesday 27th May 2015

Meeting our 2020 energy targets





Impacts & opportunity



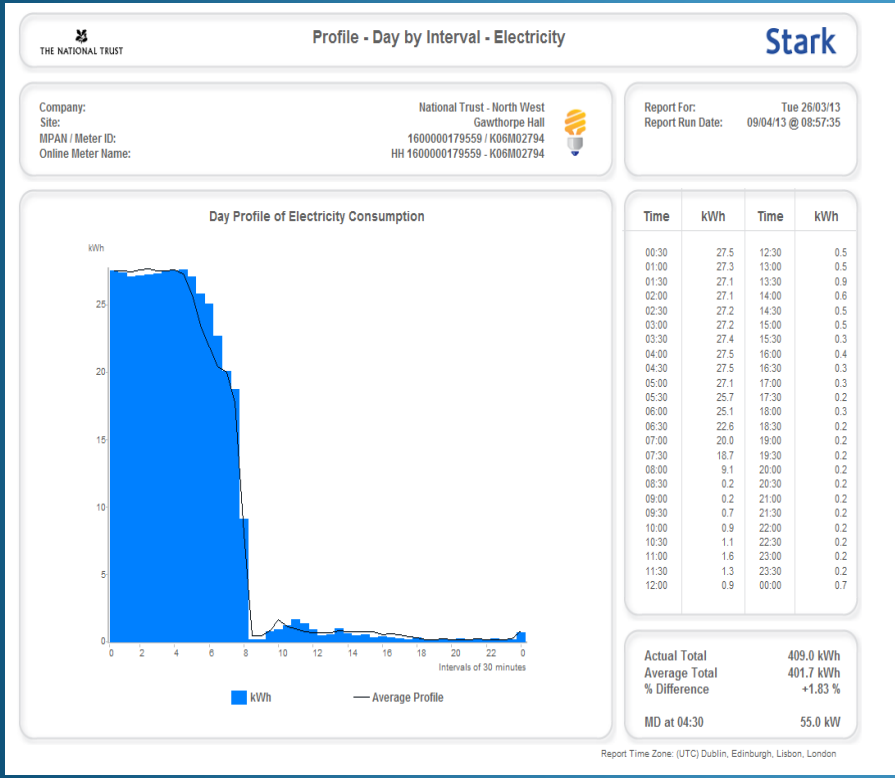
£6 Million per year on energy
Inefficient buildings

Oil / LPG & old gas boilers

Poor controls e.g. electric storage heaters / stored hot water / building envelope / lack of BMS

…lots of natural resources

We haven't been very efficient !



THE NATIONAL TRUST

Profile - Day by Interval - Electricity

Stark

Company:	National Trust - North West
Site:	Gawthorpe Hall
MPAN / Meter ID:	1600000179559 / K06M02794
Online Meter Name:	HH 1600000179559 - K06M02794

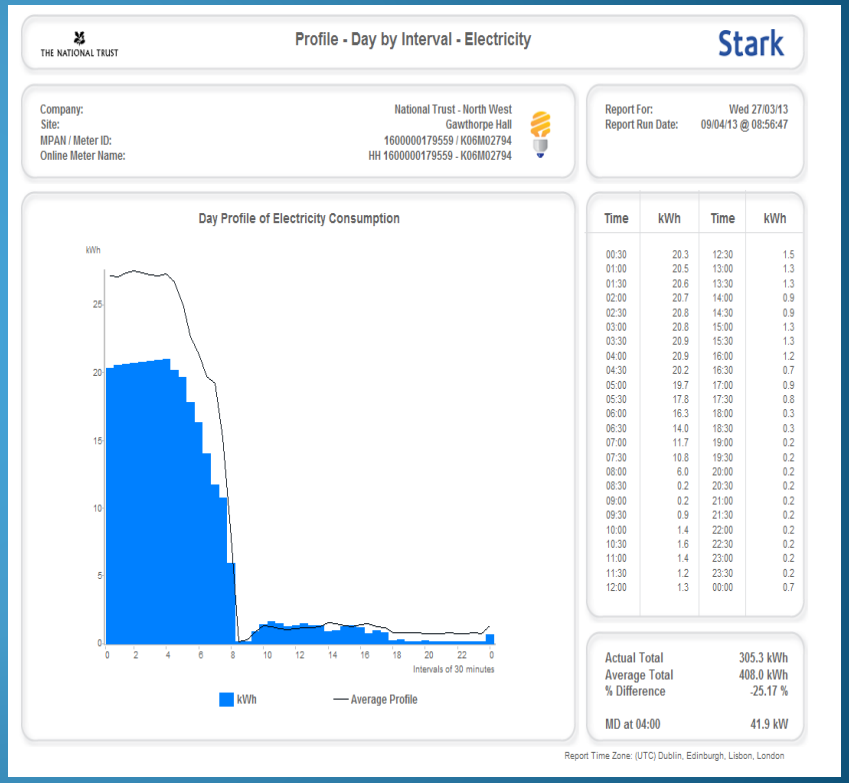
Report For:	Tue 26/03/13
Report Run Date:	09/04/13 @ 08:57:35

Day Profile of Electricity Consumption

Time	kWh	Time	kWh
00:30	27.5	12:30	0.5
01:00	27.3	13:00	0.5
01:30	27.1	13:30	0.9
02:00	27.1	14:00	0.6
02:30	27.2	14:30	0.5
03:00	27.2	15:00	0.5
03:30	27.4	15:30	0.3
04:00	27.5	16:00	0.4
04:30	27.5	16:30	0.3
05:00	27.1	17:00	0.3
05:30	25.7	17:30	0.2
06:00	25.1	18:00	0.3
06:30	22.6	18:30	0.2
07:00	20.0	19:00	0.2
07:30	18.7	19:30	0.2
08:00	9.1	20:00	0.2
08:30	0.2	20:30	0.2
09:00	0.2	21:00	0.2
09:30	0.7	21:30	0.2
10:00	0.9	22:00	0.2
10:30	1.1	22:30	0.2
11:00	1.6	23:00	0.2
11:30	1.3	23:30	0.2
12:00	0.9	00:00	0.7

Actual Total	409.0 kWh
Average Total	401.7 kWh
% Difference	+1.83 %
MD at 04:30	55.0 kW

Report Time Zone: (UTC) Dublin, Edinburgh, Lisbon, London



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Day Profile of Electricity Consumption

Time	kWh	Time	kWh
00:30	20.3	12:30	1.5
01:00	20.5	13:00	1.3
01:30	20.6	13:30	1.3
02:00	20.7	14:00	0.9
02:30	20.8	14:30	0.9
03:00	20.8	15:00	1.3
03:30	20.9	15:30	1.3
04:00	20.9	16:00	1.2
04:30	20.2	16:30	0.7
05:00	19.7	17:00	0.9
05:30	17.8	17:30	0.8
06:00	16.3	18:00	0.3
06:30	14.0	18:30	0.3
07:00	11.7	19:00	0.2
07:30	10.8	19:30	0.2
08:00	6.0	20:00	0.2
08:30	0.2	20:30	0.2
09:00	0.2	21:00	0.2
09:30	0.9	21:30	0.2
10:00	1.4	22:00	0.2
10:30	1.6	22:30	0.2
11:00	1.4	23:00	0.2
11:30	1.2	23:30	0.2
12:00	1.3	00:00	0.7

Actual Total	305.3 kWh
Average Total	408.0 kWh
% Difference	-25.17 %
MD at 04:00	41.9 kW

Report Time Zone: (UTC) Dublin, Edinburgh, Lisbon, London

Monitoring and metering system – invaluable in our experience – what works and what doesn't ?

Efficiency comes first

Efficiency comes first

Getting off oil & improving controls

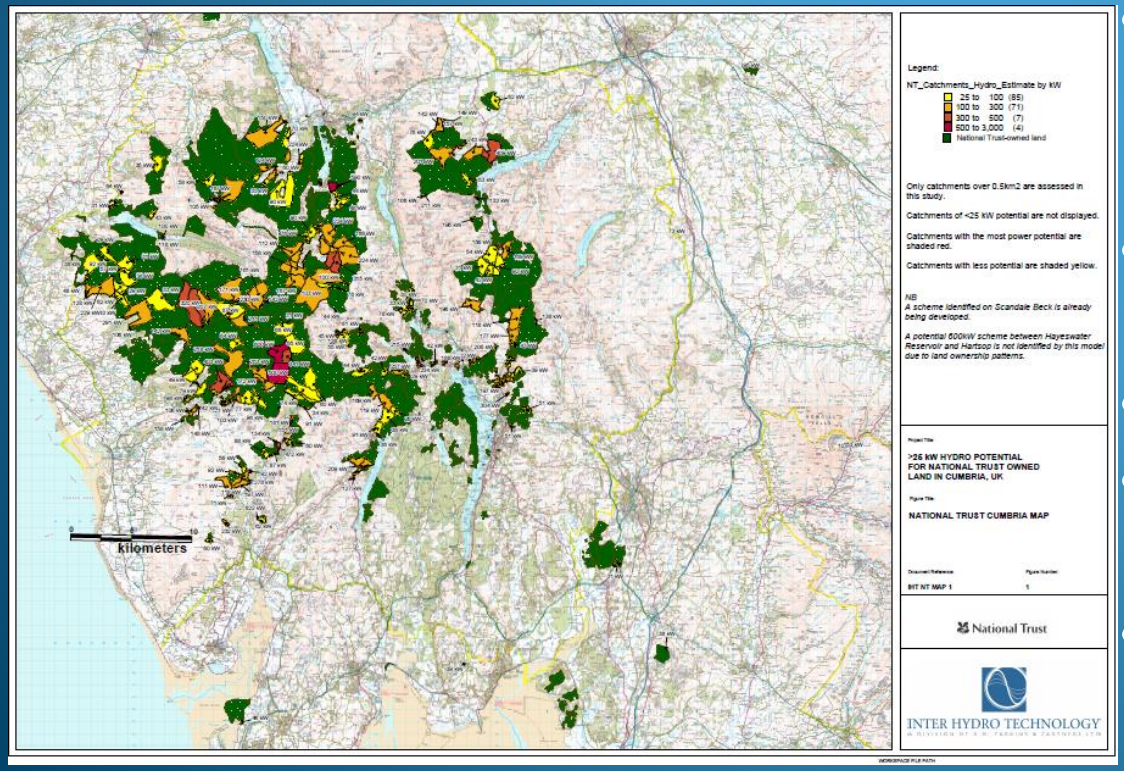
Keeping gas but new boilers, better controls and zoning

Why hydropower ?

- Lake District is the wettest place in England / Snowdonia in Wales - NT owns a lot of wet land !
- Diversification of income (2012 wet Summer)
- 2020 targets
- Reducing air pollutants & dependency on imported fuel
- As a conservation organisation, inspire and encourage others to do the same
- Supporting UK renewable energy targets

Back to those natural resources….

…but



- Grid availability – new ways of approaching this through downsizing
- Lots of NT sites are understandably sensitive !
- Naturally risk averse
- Expectations from an NT project
- Meeting our financial hurdles

Our first hydro in the lakes – what did we set out to achieve ?

Client Brief – *'build a sustainable hydro'*

One of 5 pilot renewable energy schemes given the go ahead in 2013 – it was the only viable grid connection we had at the time !!

No regrets…thinking long term

National Trust

Ongoing peer review & feasibility

Archaeology
Nature conservation
Common land
Spirit of place
Character assessments

Colleagues / peers feedback really important – on site

Water Framework Directive
Derogated reach
Abstraction licence
Fish passage
Wet flushes
Protected species
Sediment transfer
Hydromorphology

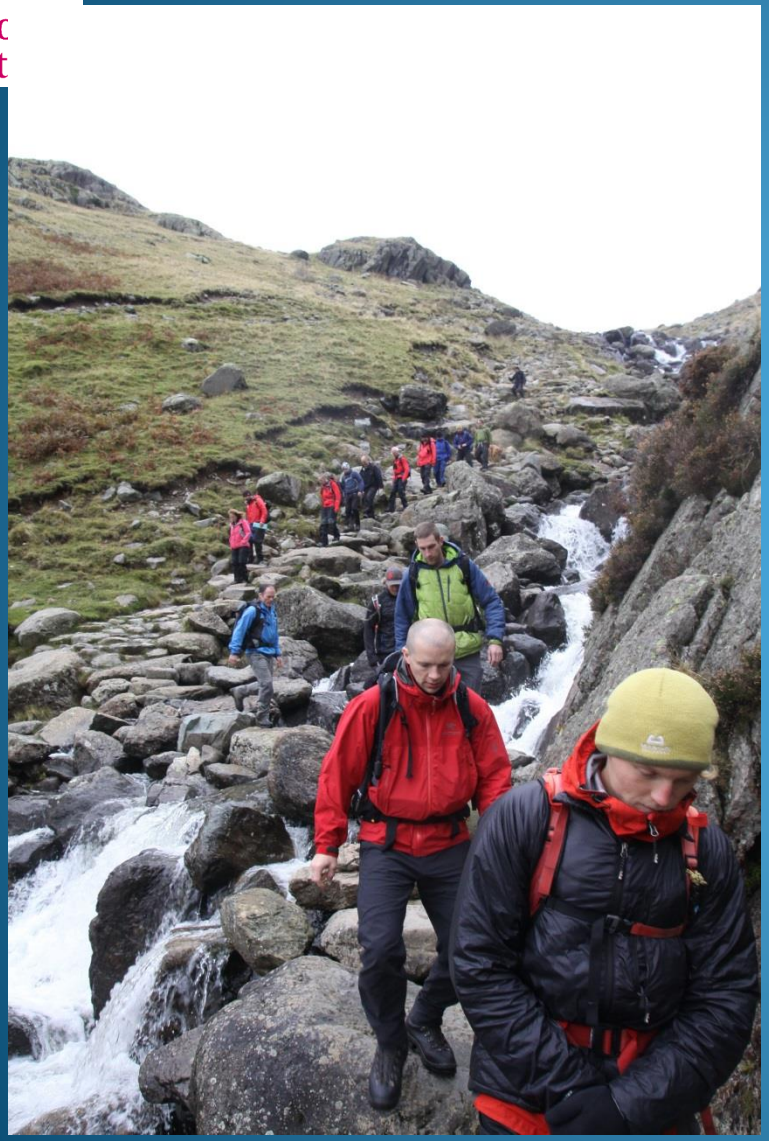
Pre – app feedback & visit from the EA really helpful

When do you announce your intentions ?

This had kept me awake at night…

200,000 visitors
'honeypot' Lake District site
our first project in the Lakes

Changing perceptions….



How many people can we reach through our renewable energy work…?

Stickle Ghyll – We are being judged on our first hydro !

Recent & ongoing hydro projects in the NT


Cragside 20kw


Quarry Bank Mill 50kw


Hafod y Porth 100kw


Hafod y Llan 660kw


Gorsen 15kw


Morden 7kw


Stickle Ghyll 100kw


Surveying x 40

Legal due diligence issues – what we have come across so far ?

Covenants
Land lease
Ownership – land registry !!
Easements
Competing scheme assessment
Substation lease
Joint venture

...its not just the EA licences / planning / flood defence & grid !

Earlier the better in the process – it saves time, money and stress later on !

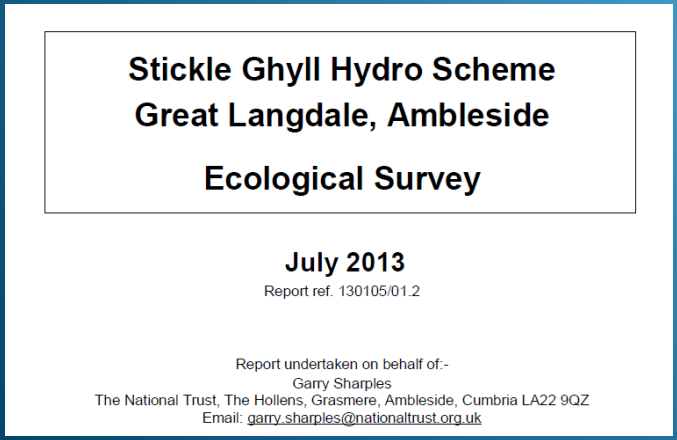
Small scale hydro (for NT)

< 15kw

Lots of opportunity with smaller schemes
Improving economics if site is good
Can link with energy hungry farms / estate offices – private wire

BUT…

Still require EA licence
Gauging & surveys cost money – makes schemes unattractive to small scale developers / estates / farms
Opportunities for permitted development on less sensitive sites ?



Stickle Ghyll Hydro Scheme
Great Langdale, Ambleside

Ecological Survey

July 2013
Report ref. 130105/01.2

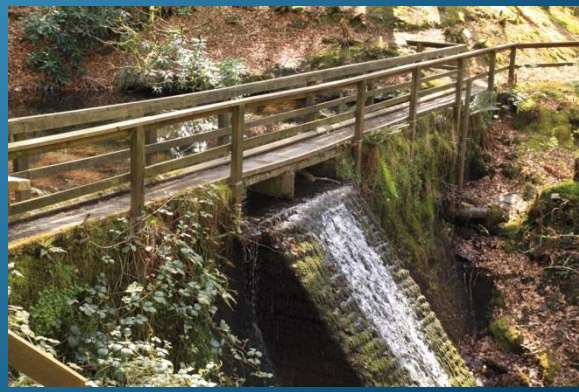
Report undertaken on behalf of:-
Garry Sharples
The National Trust, The Hollens, Grasmere, Ambleside, Cumbria LA22 9QZ
Email: garry.sharples@nationaltrust.org.uk

Key lessons learnt so far

- Visit sites – obtain as much information as possible from owners & contractors – lessons learnt !
- Cast the net wide for feedback on site selection before spending serious money
- Scope out legal issues (statutory and non-statutory) as soon as possible
- Engage with planners / EA / DNO and community early on in the process – walk the site several times
- Clear expectations of reinstatement and finish between client and contractor
- Get early understanding of the FIT / OFGEM / PPA processes and rehearse !
-

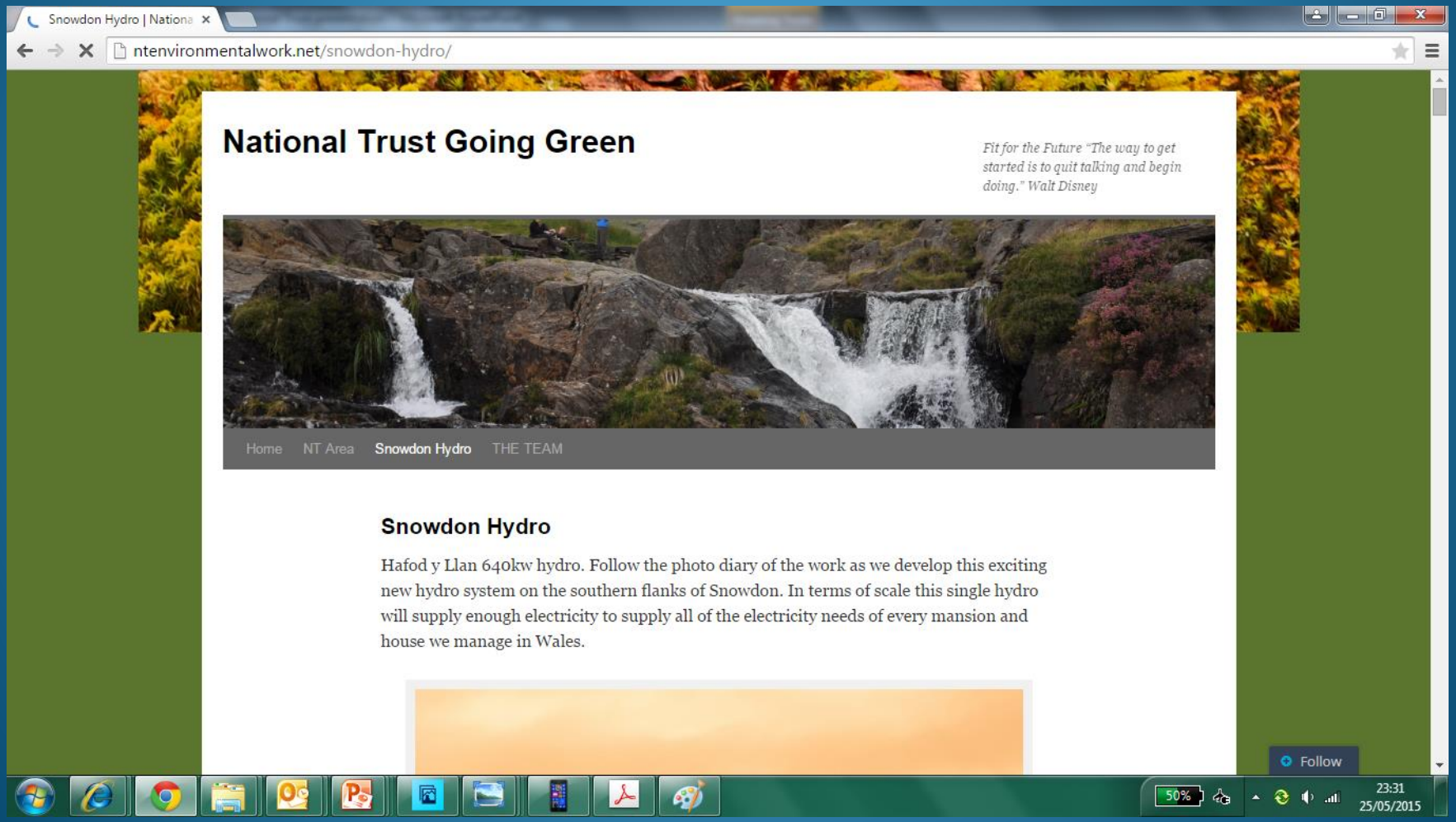
The future

- Scoping smaller hydro's
- Working with regulatory authorities on permitting issues
- Reassessing previously discounted sites (grid / sensitivities / building design)
- Developing at least 12 additional 100KW (approx) schemes before 2020
- Continuing our efficiency work
- Learning and sharing – blogs and fit for the future network



National Trust Going Green blog…

www.ntenvironmentalwork.net



Thank You

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Pop in and have a pint at the Sticklebarn sometime – you'd be drinking for charity ☺