



**Scottish
Water**



**The Scottish
Government**
Riaghaltas na h-Alba

Trusted partners
in the global
water community

Scottish Water's approach to Energy Management and development

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Key strategic drivers

1. Large consumer – 450GWh c£45m p.a.
Portfolio of 4500 supplies



2. Rising demand – growth & quality enhancement



3. Risk of rising prices & market volatility

0.85	+0.82	66.47%	5,012	0.04	0.05	109	-35	0.29938
17.21	+0.21	1.24%	68	17.21	17.22	568	7,050	11.3333 1.4
0.04	0.00	0.00%	2,043	0.03	0.04	20		
0.26	+0.01	-0.00%	4,824	0.25	0.28	3,985		
0.06	+0.01	20.00%	74	0.05	0.06	643		
0.02					0.04	4,192		
5.96	+0.09	1.53%	65	5.96	5.97	417	9,000	6.66667
0.07	+0.01	16.67%	2,506	0.07	0.08	7,432		
0.01	-0.01	-50.00%	2,579	0.01	0.02	21,729		
12.44	+0.16	1.30%	2,182	12.43	12.44	1,200		
0.69	+0.05	7.81%	1,284	0.66	0.70	3,960		
0.20	+0.01	5.26%	596	0.19	0.22	6,282		
0.05	0.00	0.00%	569	0.04	0.06	707		
0.03			357	0.02	0.04	1,519	30	0.19715
0.07	-0.01	-12.50%	3,302	0.05	0.07	65	-30	0.51286
0.42	+0.05	13.95%	35	0.40	0.43	2,804		
0.24	+0.08	50.00%	2,280	0.15	0.18	1,701		
8460	+0.00360	0.24%	10.1M	1.48455	1.48465	9.6M		
15.58	+0.11	0.71%	541	15.57	15.58	868		
0.59	+0.14	0.68%	139	20.59	20.60	1,724		



4. Our water resources, assets, topography and people.



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Energy ambition

Short term 2018:

- Host the generation of renewable energy amounting to over twice the level we consume – via private and self-investment on our assets.
- Continue to reduce the cost of providing water and wastewater services to our customers.
- Become the lowest carbon operator of water and wastewater services in the UK.

Long term

- Become self-sufficient in our energy needs – where economical to do so.



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A three pronged approach

1. Energy Efficiency

- Installed over 4000 smart meters, improved operational control and optimisation
- Alternative treatment technologies – delivering least whole-life cost & carbon

2. Increase self-generation

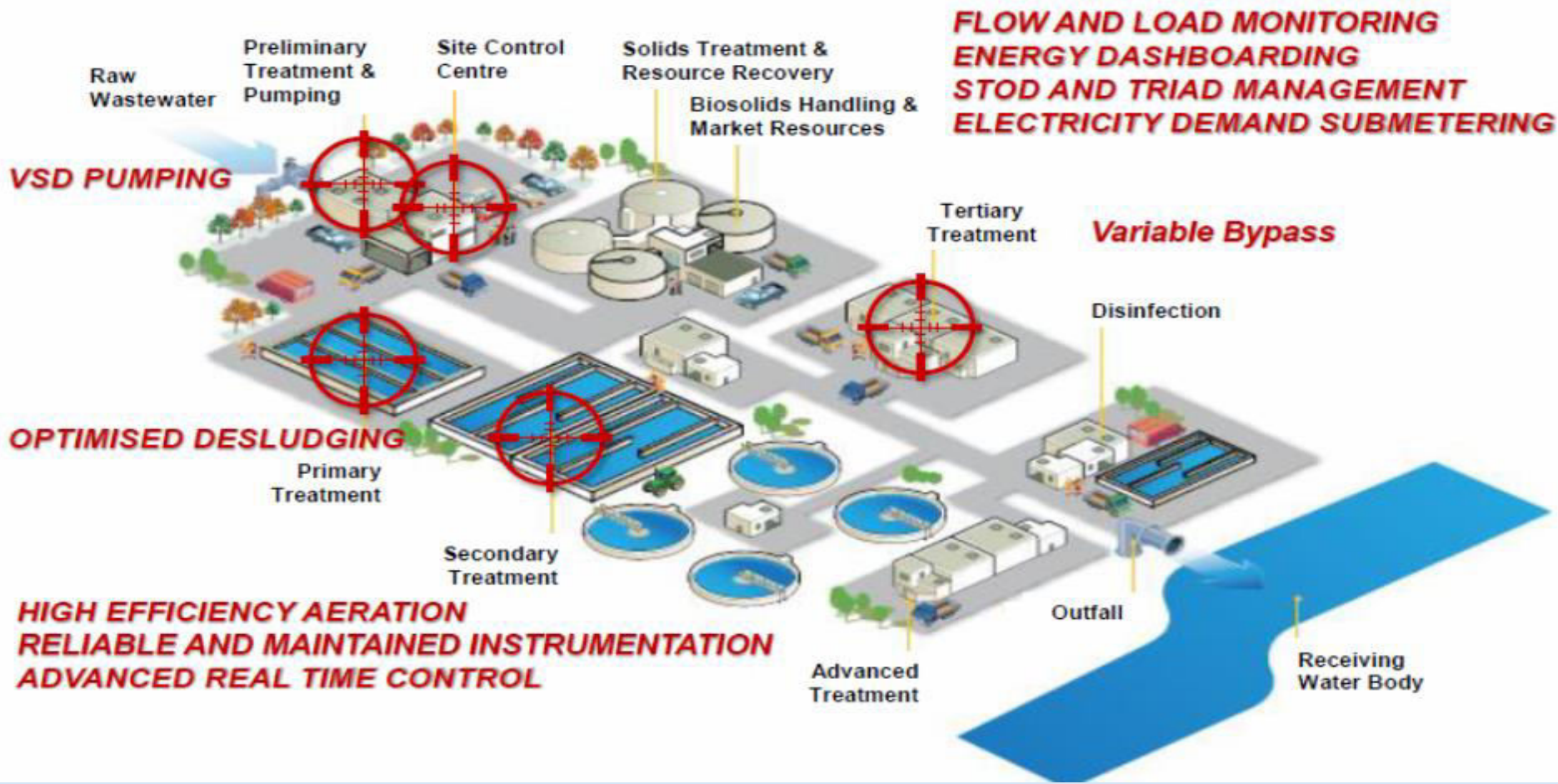
- Deploying technologies that maximise value from our asset base
- Using treatment works and networks as energy factories

3. Hosting private investment

- Where compatible with providing excellent service quality, environmental protection and enhancement

An integrated “Single Programme” –
seeking best return on investment for customers

Energy efficiency



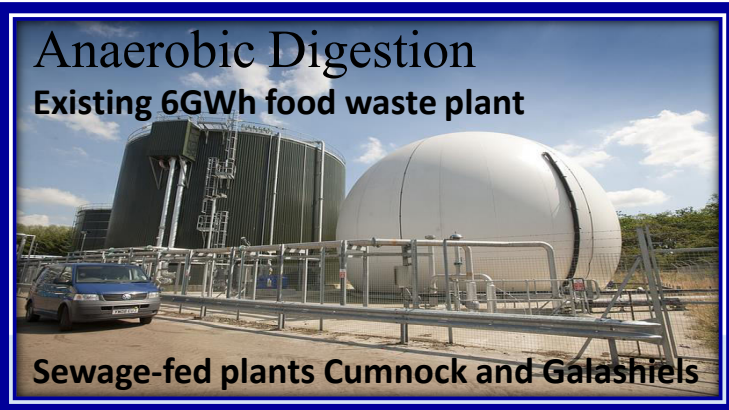
Self-generation: renewable diversification



*Doubled our
capacity since
2013*



18% net reduction in carbon emissions since 2007



*Over 45 sites
fully or partially
sufficient*



Hydro: Reservoirs and Water Treatment Works

Integrated into existing
civils structures.

1 on compensation flow
1 on reservoir spill
2 on inlet to WTW

2.3 GWh p.a.



Annual generation
greater than annual
consumption.



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Network – ‘in-line’ generation

- Zeropex ‘DifGen’
- UK first on a major trunk main
- Dual benefit – service and power
- Payback under 6 years



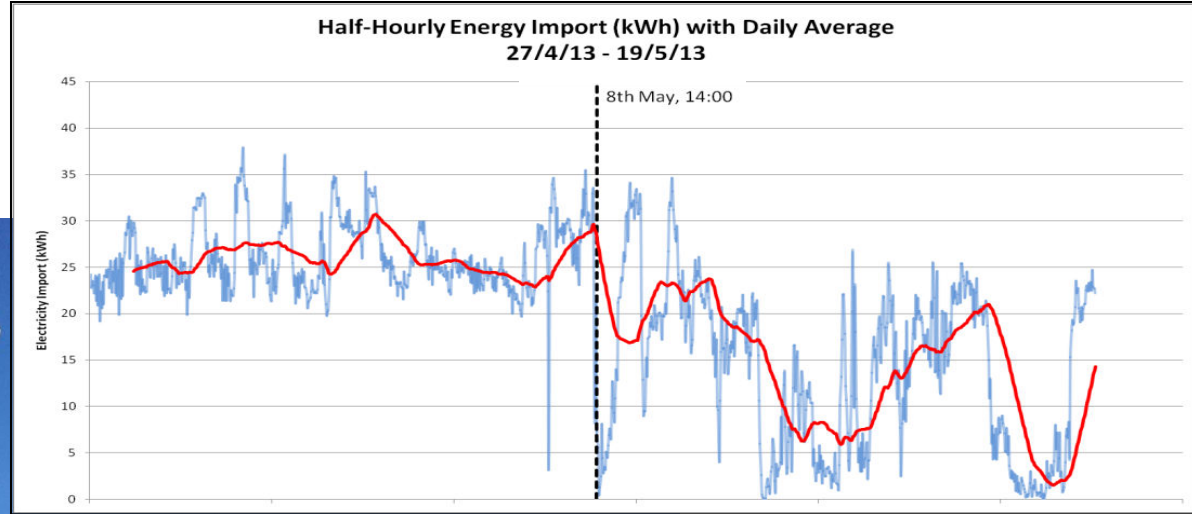
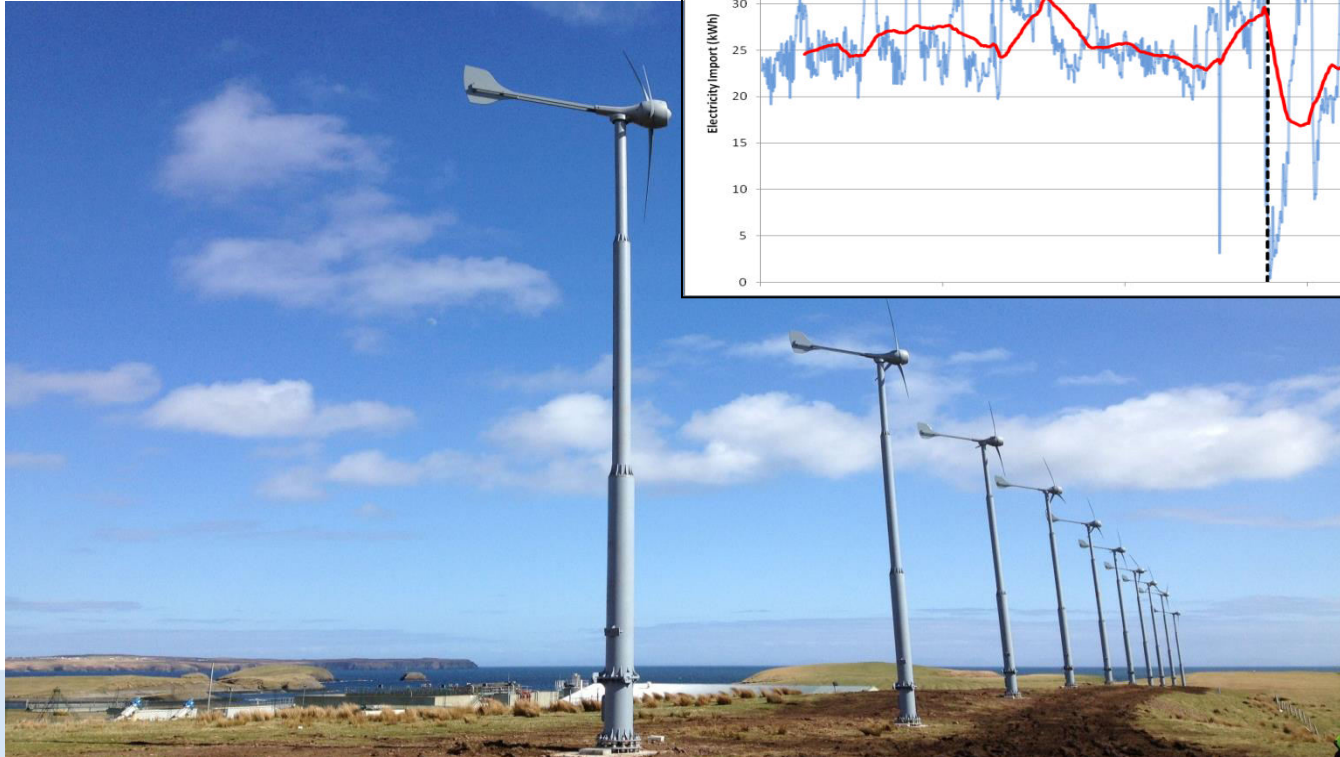
- Developed further...
 - modular design
 - pre-fabricated off-site



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Wind – small scale



Stornoway
Wastewater works
60% reduction



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Anaerobic Digestion

- ✓ Make use & improve a redundant asset
- ✓ Supports SW growth and energy ambitions
- ✓ Supports national waste policy
- ✓ Started food waste collection business



Local Authority contracts for food waste

6 GWh/annum

3. Hosting private investment

Where:

- An attractive return for customers, and
- Compatible with providing a high quality water service, environmental protection and enhancement.

Large wind Farms - SW land

- 350 GWh operational
- 550 GWh consented
- 3 in planning / development 260GWh
- Facilitating over £0.5bn investment
- Landlord rental or discounted power purchase agreement

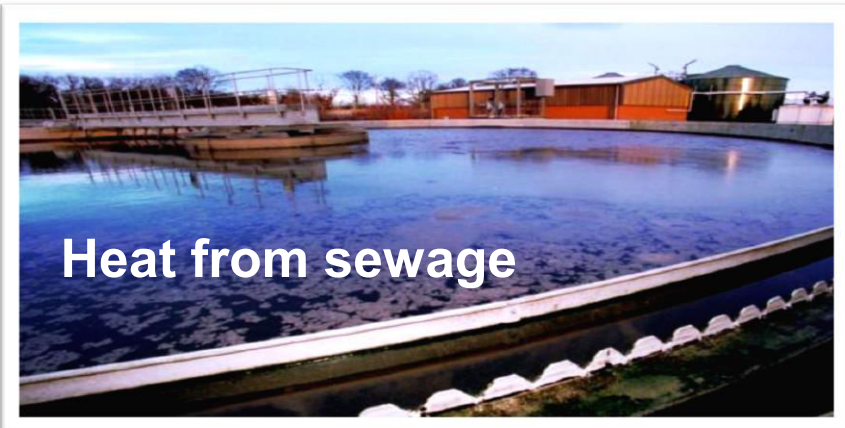
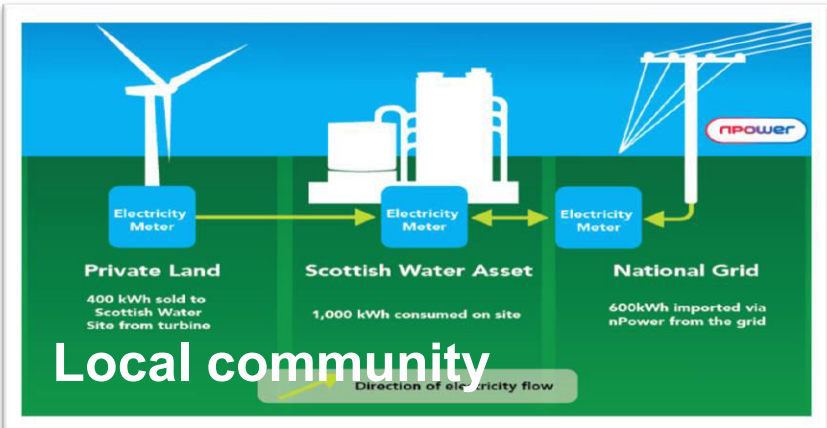
Scottish Water is making a significant contribution to national renewable targets and a low carbon economy.



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Finally.....developing new opportunities





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Thank You



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