



**SustainableBuildings**  
Northwest



# Mark Hilton: Enviros

# Water Conservation in Buildings



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**Enviros Consulting Ltd**

**The No 1 brand in environmental consultancy\* (ENDS Survey 2007)**

# Presentation Content

- Water Reduction Measures
- Building Regulations (BR)
- Code for Sustainable Homes (CSH)
- Enhanced Capital Allowance



# Water – Key Issues

- Water Shortages/Drought
  - 400% increase in water consumption in the last 50 years
  - 3.4 million people face water restrictions in SE England
  - Abstraction can also affect aquatic life
  - Water Act 2003; emphasis on conservation
- Treatment/Supply
  - Requires a lot of energy and chemicals
  - Typical around £1.70 per m<sup>3</sup>
  - Cost to increase by 20% in next few years



## Impacts of Housing Growth in East of England

Scenario	2009/10	2014/15	2020/21	2029/30
1.	<ul style="list-style-type: none"> <li>• 8 zones in deficit</li> <li>• Deficit: -52 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 9 zones in deficit</li> <li>• Deficit: -175 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 10 zones in deficit</li> <li>• Deficit: -272 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 14 zones in deficit</li> <li>• Deficit: -399 MI/d</li> </ul>
2.	<ul style="list-style-type: none"> <li>• 6 zones in deficit</li> <li>• Surplus: 119 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 2 zones in deficit</li> <li>• Surplus: 72 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 3 zones in deficit</li> <li>• Surplus 60 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 7 zones in deficit</li> <li>• Deficit: -39 MI/d</li> </ul>
3.	<ul style="list-style-type: none"> <li>• 2 zones in deficit</li> <li>• Surplus: 126 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 1 zone in deficit</li> <li>• Surplus: 84 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 1 zone in deficit</li> <li>• Surplus: 79 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 2 zones in deficit</li> <li>• Deficit: -10 MI/d</li> </ul>
4.	<ul style="list-style-type: none"> <li>• 1 zone in deficit</li> <li>• Surplus: 139 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 1 zone in deficit</li> <li>• Surplus: 110 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 1 zone in deficit</li> <li>• Surplus: 120 MI/d</li> </ul>	<ul style="list-style-type: none"> <li>• 2 zones in deficit</li> <li>• Surplus: 52 MI/d</li> </ul>
*TWU Thames zone not included in overall deficit calculations				

### KEY



Acceptable impacts

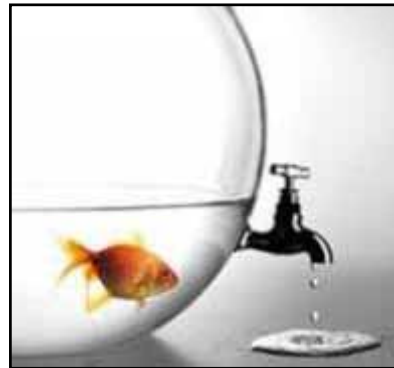


Marginal impacts



Unacceptable impacts

# Water Minimisation Measures



# Typical Water Consumption

<u>Item</u>	<u>Average water use</u>
Toilets	7.5 - 9 litres/flush
Sinks	3 - 6 litres/event
Showers	30 - 60 litres/event *
Baths	50 - 170 litres/event
Dishwasher	20 - 40 litres/event
Laundry (washing machine)	60 - 100 litres/event
Vehicle washing	50 - 100 litres/vehicle (bucket) 400 - 900 litres/vehicle (hose)
Garden	8 - 10 litres/minute
Employee (full-time, no canteen)	25 - 50 litres/day/person
Employee (full-time, canteen)	40 - 90 litres/day/person

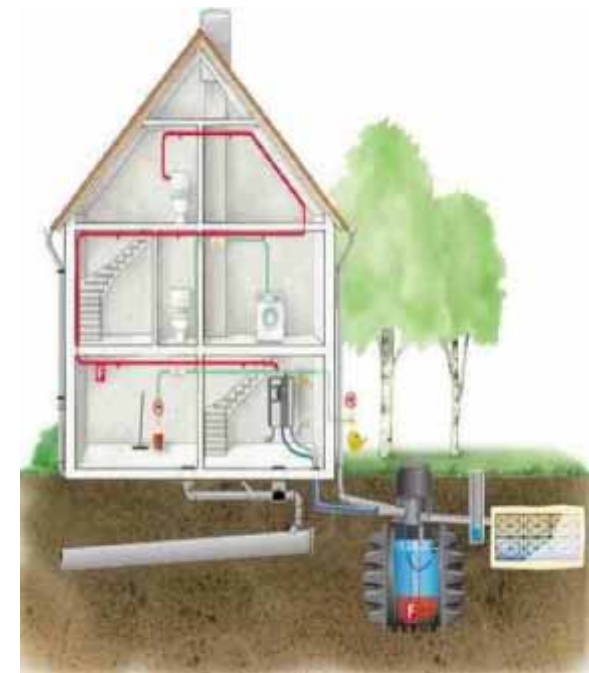
# Alternative Water Supplies

- Borehole, river, canal abstraction etc
- Water must be treated appropriately:
  - filtration / softening (e.g. ion-exchange)
- Rule of thumb: Softening 5p/m<sup>3</sup>; Demineralisation 15p/m<sup>3</sup>
- Typical cost: 2-3" diameter, 20-50m depth
- £15,000 - £30,000
- Abstraction licence application / annual fees
- Abstractions < 20 m<sup>3</sup>/d
  - generally need no licence



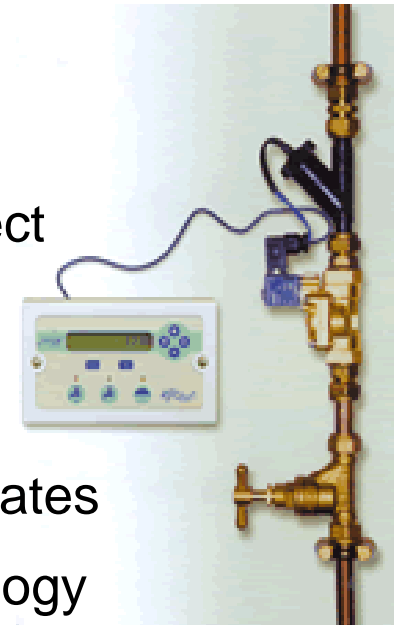
# Rainwater Harvesting / Greywater

- Allowable under ECA scheme
- Ideal for low grade non-potable, can be high quality
- UV treatment can be added
- E.g. [www.rainwaterharvesting.co.uk](http://www.rainwaterharvesting.co.uk)
- Only cost-effective in new build?
- Storm water tanks can double for RWH
- Link to SUDS

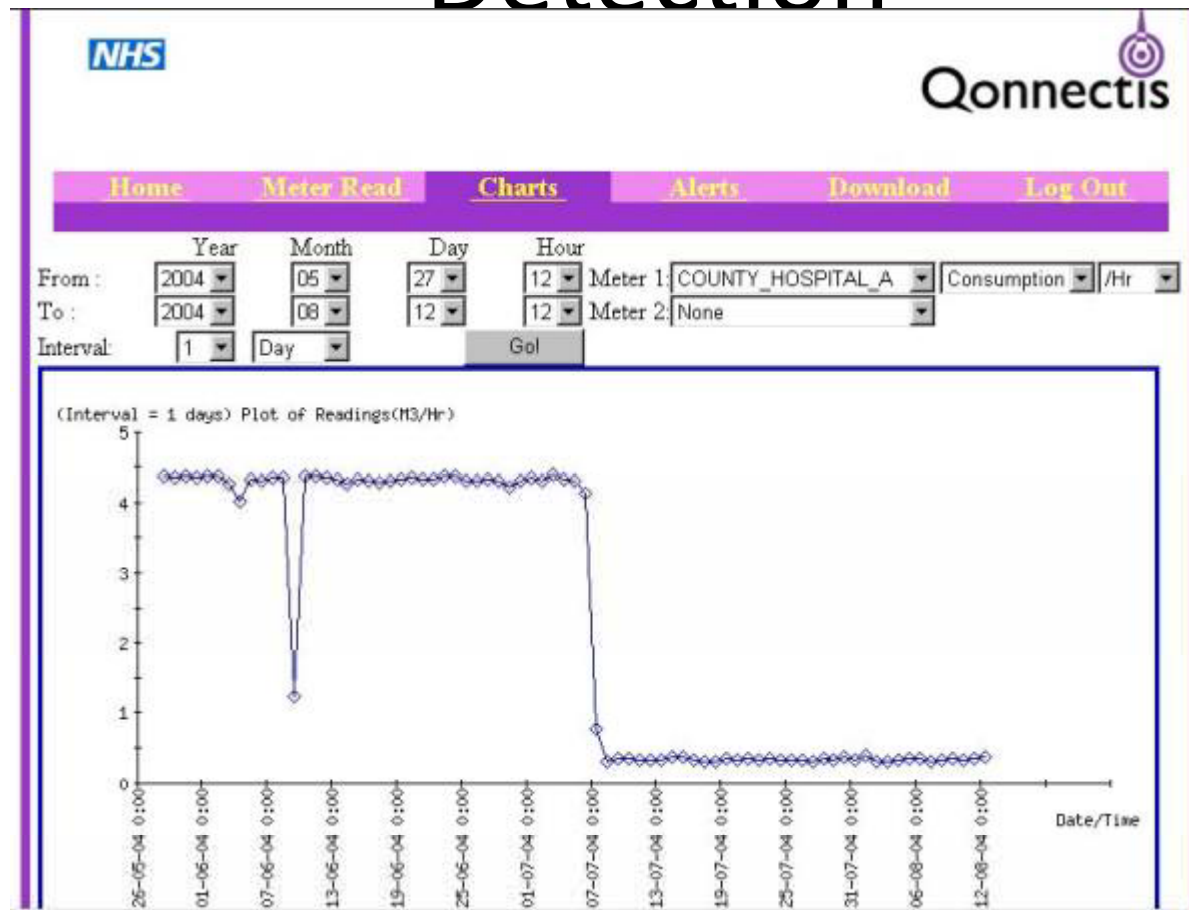


# Leaks / Overflows

- Do preventative maintenance on:
  - taps, cisterns, tanks, pumps, valves
- Keep pipes/tanks above ground - leaks easier to detect
- Lag pipes to avoid freeze bursts
- Fit electronic leak detectors
  - Work on timer basis / by detecting increased flowrates
- Remote data loggers – mobile phone/satellite technology

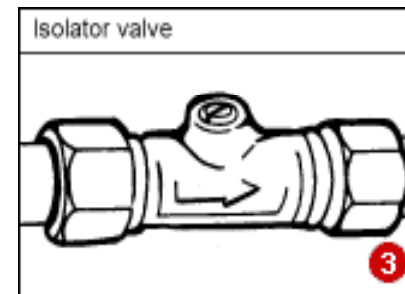


# Data Logger Leak Detection



# Water Reduction - General

- Meter and sub-meter (portable/remote meters/loggers)
- Restrict mains water pressure locally where high
- Isolate certain areas at certain times
- Educate staff (e.g. use posters and stickers)



# Toilets

- Fit sensors to control urinal flushing
  - [www.cistermiser.co.uk](http://www.cistermiser.co.uk)
- Use water-less urinals:
  - Micro-biological (ingredient blocks)
  - Oil barrier / valve (to stop odours)
- Use dual flush WCs (new or retrofit)
  - or fit CVAs (old cisterns)
- Max. flush volume 6 litres by law
  - Water Supply (Water Fittings) Regulations
- Use delayed action cistern valves (Torbeck Ecofil)



# Taps and Showers

- Fit spray tap heads or aerator inserts (e.g. tapmagic):
  - 2.5 litres per min
- Use electronic or self-closing taps:
  - IR sensors or push-top
- Some lever taps increase resistance to movement as flow increases
- Locate boilers/hot water tanks near to areas of use
- Aerator shower heads – 7 litres per min



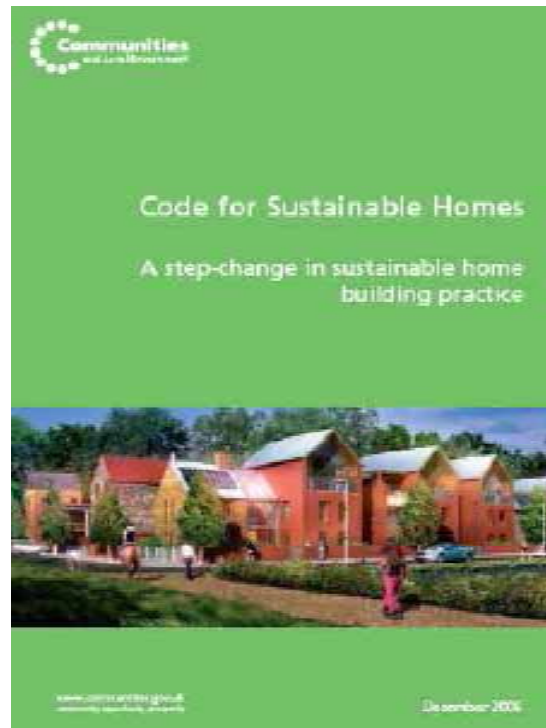
# Innovations in the Shower

Electrolux Fog Shower: 2 litres of water for a 5 min shower!



Getting the kids out of the shower?!

# CSH and Building Regs



# Minimum Standards and Regulations

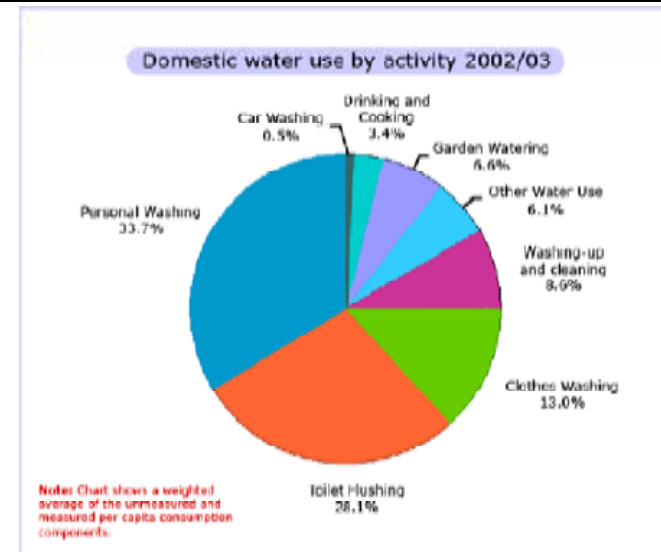
- Water Supply (Water Fittings) Regulations – individual fittings
- Building Regulations – new whole building standards; 125 l/p/d
- Planning Policy, e.g. Leeds CC: *“All major residential developments should achieve average water use in new dwellings of no more than 105 litres/person/day.”*



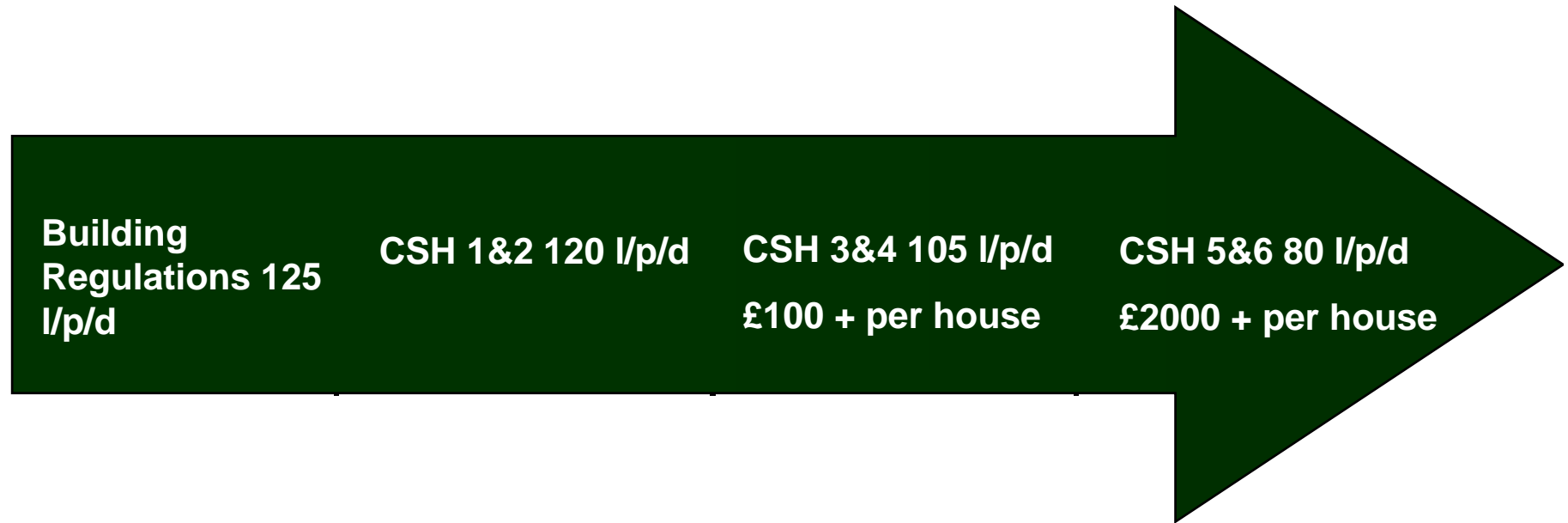
# Code for Sustainable Homes

Code Level	Category	Minimum Standard
1 (*)	<b>Water</b> Internal potable water consumption measured in litres per person per day (l/p/d)	120 l/p/d
2 (**)		120 l/p/d
3 (***)		105 l/p/d
4 (****)		105 l/p/d
5 (*****)		80 l/p/d
6 (*****)		80 l/p/d

- Water 6 points / 104
- Surface water runoff 4 points / 104



# A Simple Progression



# GHG Savings – 25% Energy Efficient Homes

Location	Annual CO <sub>2</sub> Savings by 2030	Cumulative CO <sub>2</sub> Savings by 2030	Equivalent Number of Cars per year (based on ~ CO <sub>2</sub> per year)
East of England	24,000	300,000	115,000
Essex	3,000	38,000	15,000
Chelmsford	400	5,000	2,000

# **Enhanced Capital Allowances**

# Capital Allowances

Year	Expenditure written off against profits		
	Normal Rate	SMEs Rate	100% ECA
1	25.0	40.0	100
2	18.8	15.0	-
3	14.1	11.3	-
4	10.5	8.4	-
5	7.9	6.3	-
6	5.9	4.7	-
7	4.4	3.6	-
8	3.3	2.7	-
9	2.5	2.0	-
10	1.9	1.5	-

# Water Technologies List

Numerous qualifying products:

- Rainwater harvesting
  - Meters and monitoring equipment
  - Flow controllers
  - Leakage detection equipment
  - Low flush toilets
  - Efficient taps
  - Etc.
- 
- **[www.eca-water.gov.uk](http://www.eca-water.gov.uk)**

# How much can you claim?

- The price paid for a new product
- Costs directly associated with the installation of the kit
- Claims only for products on the Water Technology List
  - at the time of investment
- Claim ECA as part of normal income /corporation tax return

# Further Information



- [www.defra.gov.uk](http://www.defra.gov.uk)



- [www.communities.gov.uk](http://www.communities.gov.uk)

Environment <sup>uk</sup> Advice Line

0800 585794

- [www.envirowise.gov.uk](http://www.envirowise.gov.uk)

Thank You

Any Questions?

# Future Issues

- Water Supply (Water Fittings) Regulations 1999
- Trend for higher water use fittings – tighter regulation must be combined with education and awareness-raising
- The market for sustainable homes – consumer attitudes
- Changing lifestyles/demographics
- CSH increasingly being used by planners, housing associations and EP.
- Cultural and cost implications of achieving CSH levels 5 and 6

