NW Sustainable Buildings Policy

Awareness Raising and Knowledge Transfer Programme

WATER: Minimising Consumption, Measures for Recycling and improving Drainage

Buildings - Minimising Water Use and Cost

Colin Woods Advisor to Envirowise

About Envirowise

- Government-funded programme: DEFRA
- Dedicated to putting the sustainable use of resources at the heart of UK business practice.
- Provide **FREE** practical help & advice for businesses
- Promote better environmental practices
- Reduce UK industry's impact on the environment
- Help you save money – increase profitability

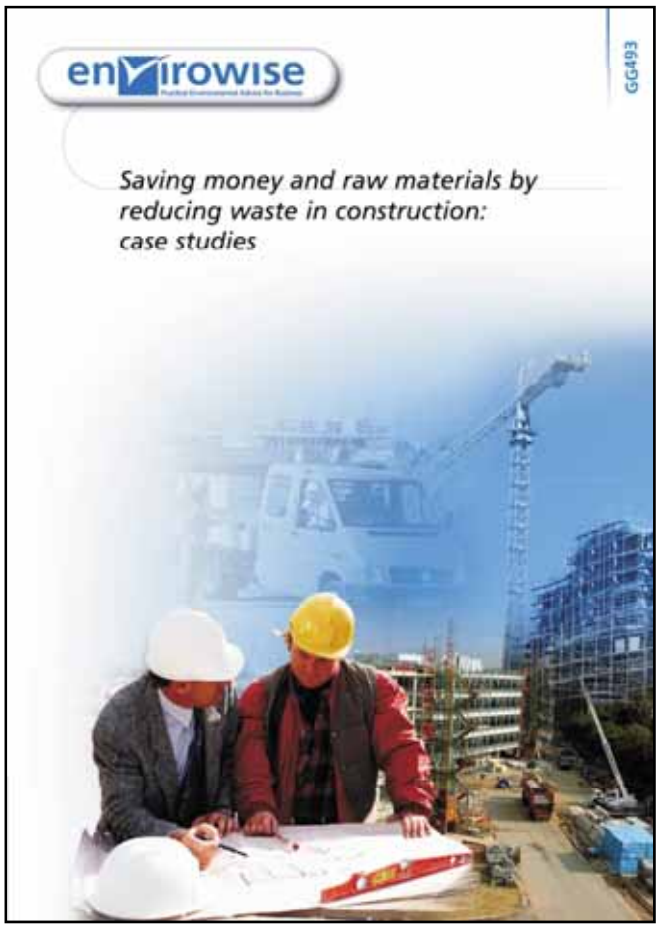
- Saved UK industry more than £1 billion since 1994

envirowise SUSTAINABLE PRACTICES SUSTAINABLE PROFITS

Publications & E- Newsletters

• Over 400 Publications (Best practice guides, environmental fact sheets, case studies) – Free to Download or Order Hardcopies

- E-Update (all sectors)
- TastE-News (Food & Drink)
- **BrickSandMortar (Construction)**
- De-Zine (Design)
- Talking Shop (Retail)
- Catalyst (Chemicals)
- Green Officiency (Commercial)
- Productivit-E (Printing, Furniture, Manufacturing, Engineering)



envirowise } SUSTAINABLE PRACTICES SUSTAINABLE PROFITS

Presentation Objective

To raise awareness of :

- Envirowise services/support

- Practical measures construction companies can take in design & construction phases to reduce a building's water consumption during construction and in use.

Also to reinforce the worth of water reduction and cost saving measures through case studies

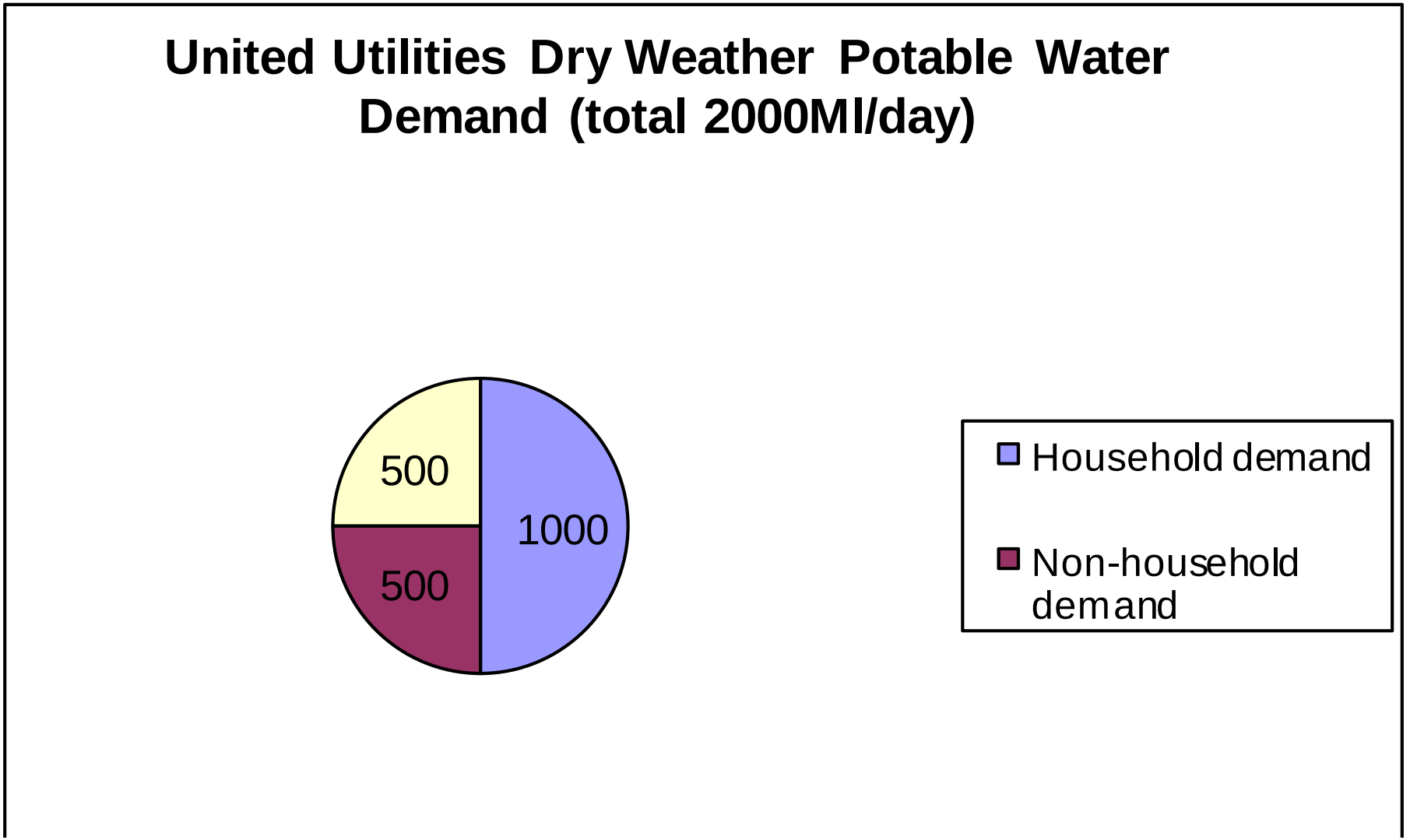
Outline of the Presentation

- How much potable water is used in NW
- What buildings use potable water in NW and how much do they use.
- How is water saving achieved.
- Designing water systems in buildings

"to prevent waste, undue consumption and misuse" water byelaw & water saving practitioner requirements

- Water saving NW case study examples

UU Potable Water Demand (Water Resource Management Plan Jan 2009)



Household water use

Internal

WC (50% of Household use)

Shower,

Washbasin

Bath

Bidet

Kitchen Sink

Dishwasher

Washing machine

Swimming pool

External

Garden hose

Car washing

Drive / Path cleaning

Pond

Hot tub

Paddling / swimming pool

Minimise use with:

Meters (UU report 8.3% reduction)

Low use fittings

Rainwater Harvesting / Grey water systems

Non – household use

Offices
Retail
Schools
Hospitals
Prisons
Public buildings
Industrial units /factories

Use all as Households for domestic use but higher use +

Urinals
Larger washing machines
Larger dishwashers
More vehicle washing
Use in Product
Boilers
Cleaning
Washing
Cooling
Evaporation

Minimise use with:

Meters
Leak detection
Resource management
Low use fittings/urinal control
Rainwater Harvesting / Grey water systems
Water treatment & recycling
BAT

Building Services Design for Minimising water use and cost

Comply with Water Byelaws

"prevention of waste, undue consumption, misuse or contamination"

Bursts – frost protection

Leaks – dissimilar metals, corrosion

Overflow Warning – Storage Tanks, WCs

Isolation valves

Urinal Flushing

Building Services Design for Minimising water use and cost

Design Considerations:

- Understand Building use and how water will be used and managed.
- Meter areas of different responsibility
- Meter key water using operations / plant
- Select low water use equipment options.

On Project Completion provide

- As built plumbing drawings
- As built plumbing schematic (basis of water balance)
- Equipment details (design operating pressures and flow rates)

Commission the water systems (CIBSE Commissioning Guide W)

How do we reduce water use and cost in buildings?

Successful water reduction at home, school, office, factory, construction site, hospital, hotel, region, industry sector or country…… is achieved through:

People

Awareness, involvement, ownership

Systems

Measurement, performance standards, benchmarking, Optimisation

Technology

Low use fittings, Measurement, control, manufacturing, recycling

Case Study No1 – Center Parks Envirowise Case Study CS617

Accommodation 4,668 guests (Occupancy 95% +)

12 restaurants, 772 lodges, 79 apartments, swimming pools.

Borehole Supply with mains water backup

307,600m3 of water use 2003/4

Leakage survey

89 leaks identified and repaired

6,000m3 of borehole water saved

£4,200 sewage charge saving

Water Balance identified lodges greatest user

750 Shower flow restrictors saved 23,000m3 pa

Saved £ 16,000pa in sewage charges (payback 2 weeks)

740 WC Cistern Volume adjusters saved 1000m3pa

Saved £756pa in sewage charges

Case Study No 2
Project Catalyst - JW Lees Brewery

Established 1828

Production 80,000 barrels p.a.

Water use 160,000 m³ p.a. (960,000 barrels)

Water use performance indicator = 12:1

Industry performance = 2:1 to 14:1

Water / Wastewater costs – £120,000 p.a.

JW Lees – Action Plan

Stage 1

Site audit where and how efficiently water is used

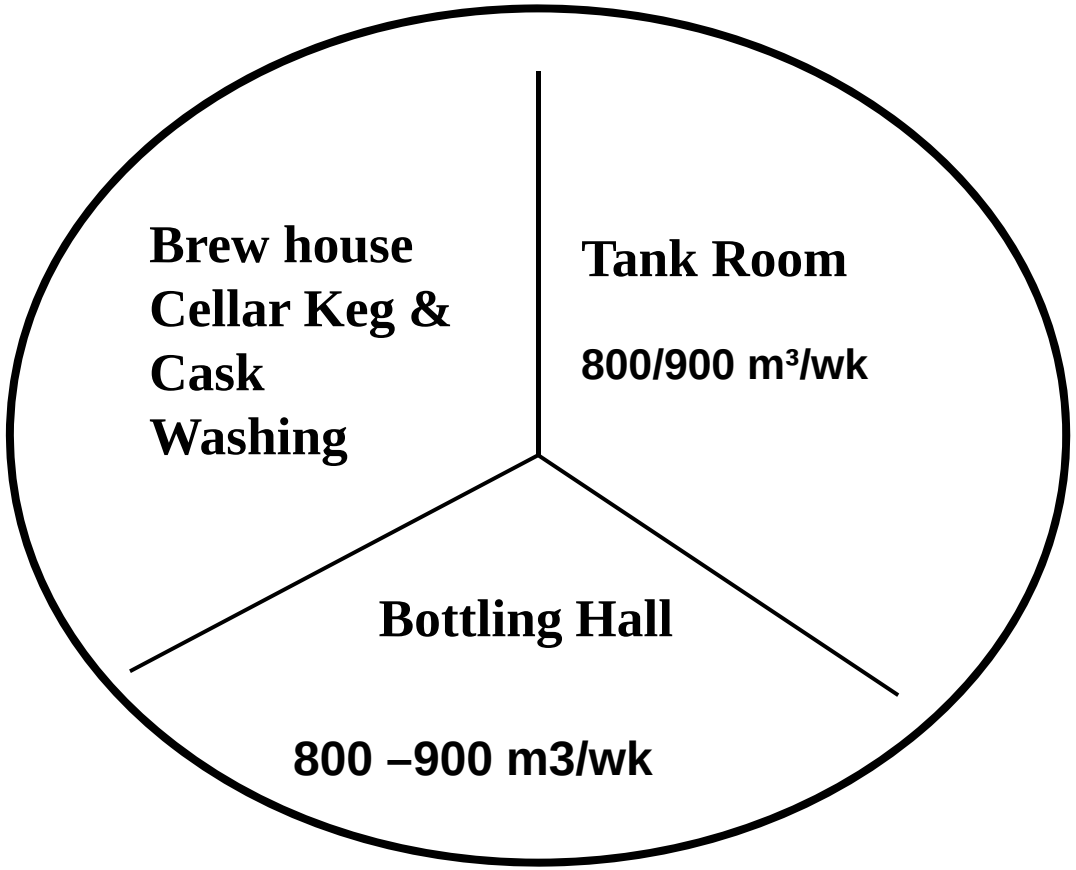
Stage 2

Understand plumbing - as installed drawings, water balance install and read meters

Stage 3

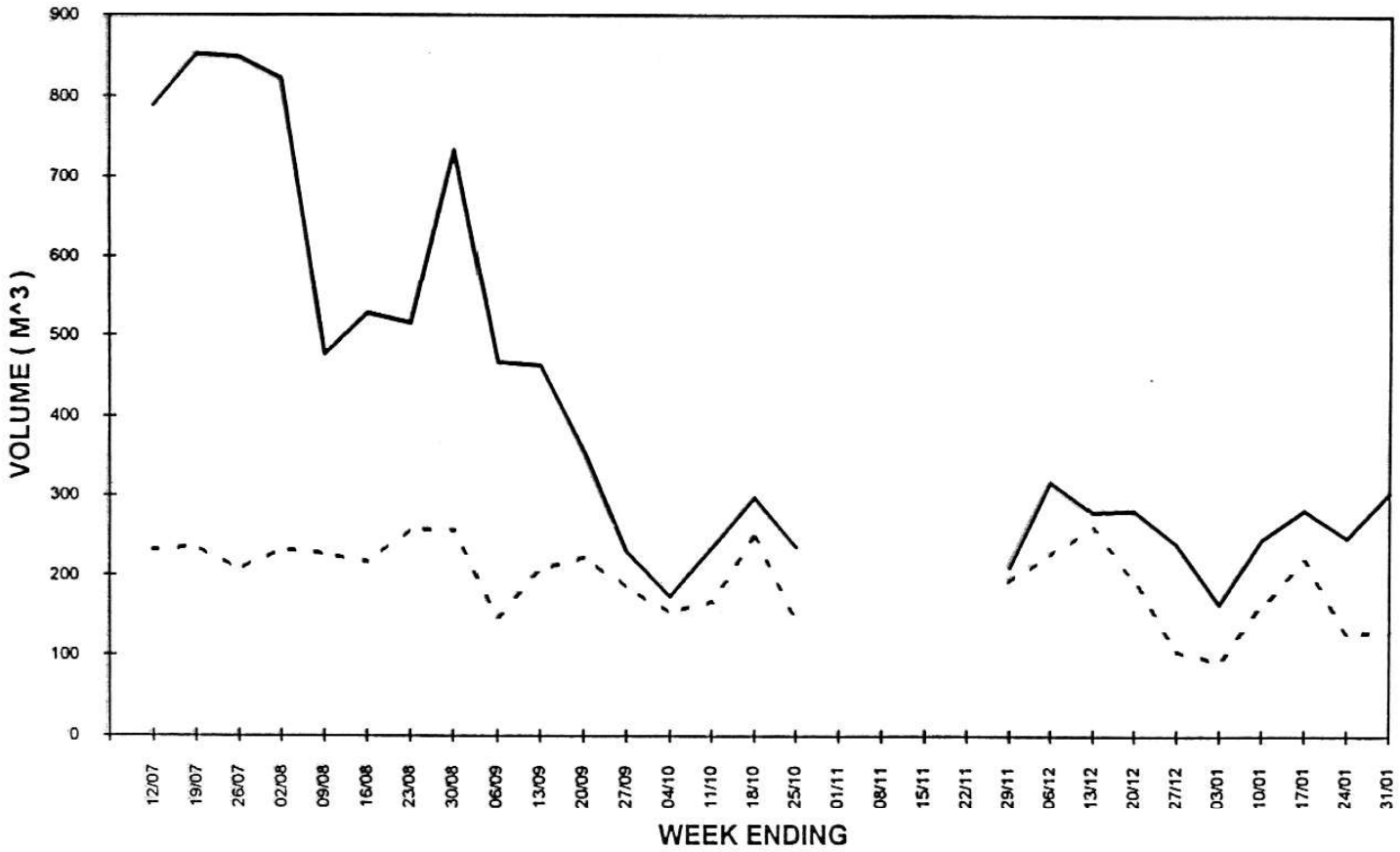
Establish water management practices Analyse water usage and implement change

Breakdown of Water Usage



Water Usage - 2,500 – 3,000 m³/wk

TANK ROOM


VOLUME (M^3)
900
800
700
600
500
400
300
200
100
0
12/07
19/07
26/07
02/08
09/08
16/08
23/08
30/08
06/09
13/09
20/09
27/09
04/10
11/10
18/10
25/10
01/11
08/11
15/11
22/11
29/11
06/12
13/12
20/12
27/12
03/01
10/01
17/01
24/01
31/01
WEEK ENDING

JW Lees - Results

Water Performance reduced from 12:1 to 8:1 initially

Water Performance reduced 8:1 to 5:1 (technology change)

Water / Wastewater costs reduced by

£75,000 p.a. (60%)

45 resource efficiency opportunities identified with potential saving of £ 300,000 p.a.

Case Study No 3
“Quick Meals are R Us”

Managing water use in relation to production outputs.

Identifying key water users and wasters

Importance of metering key water users

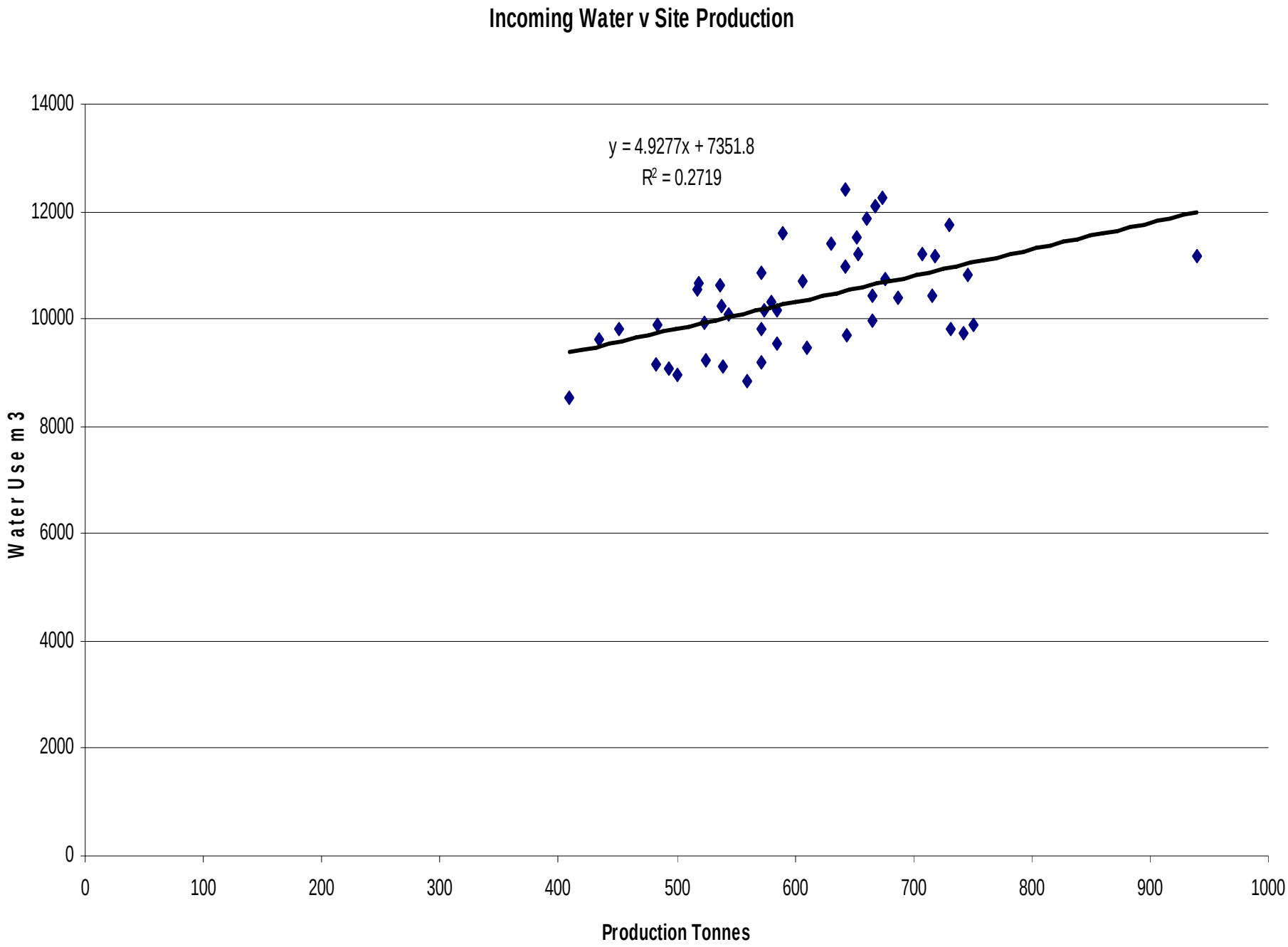
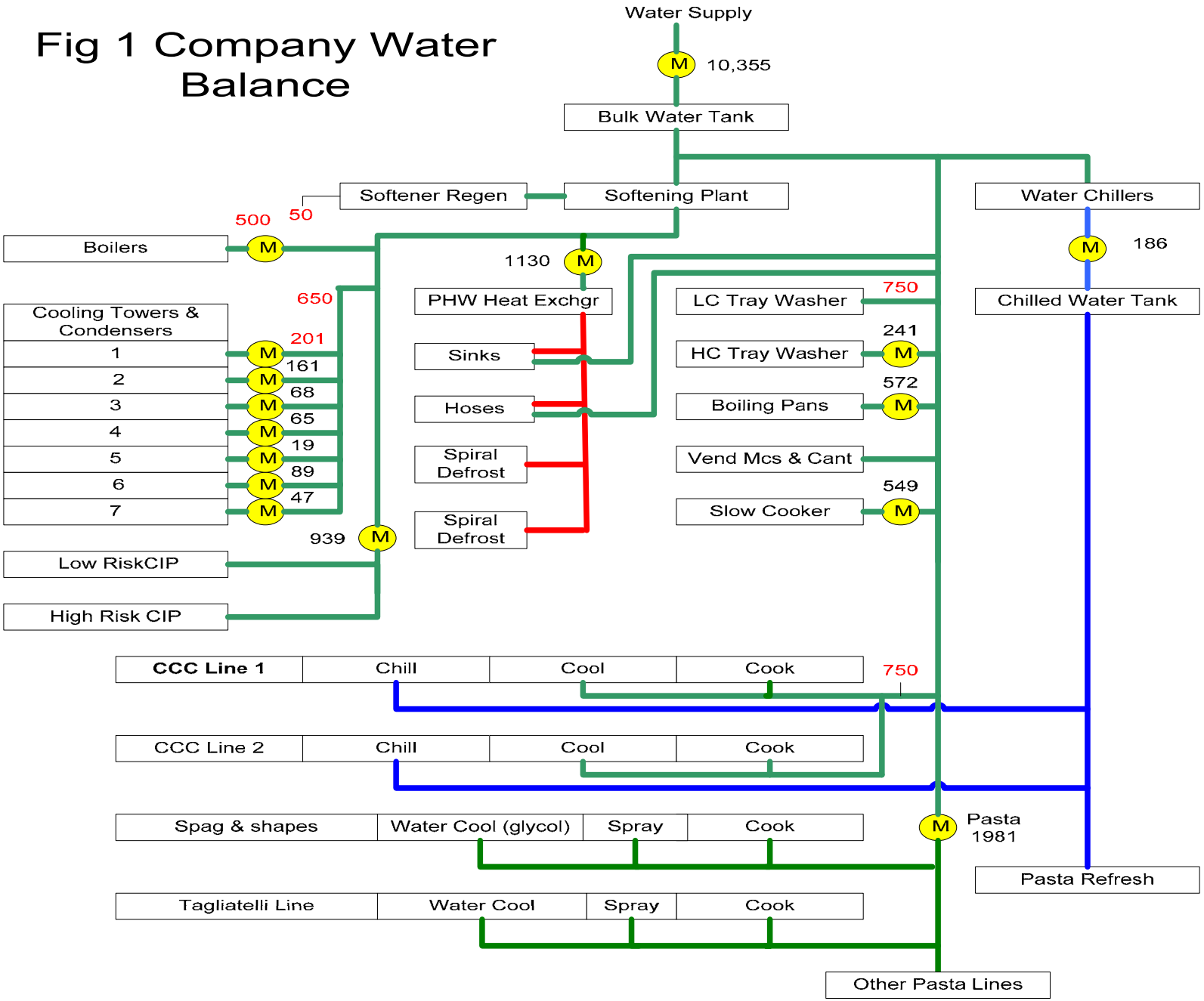
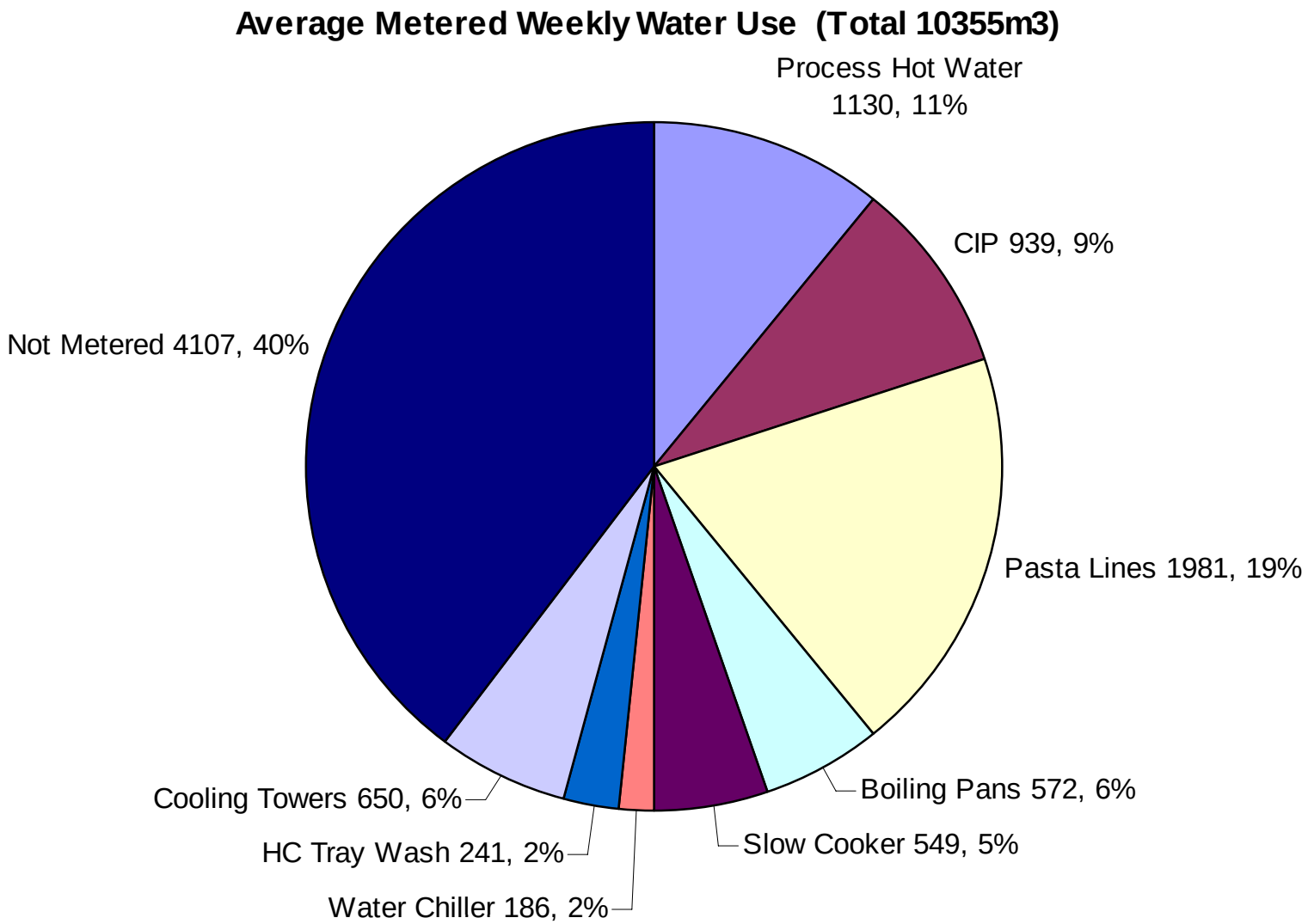
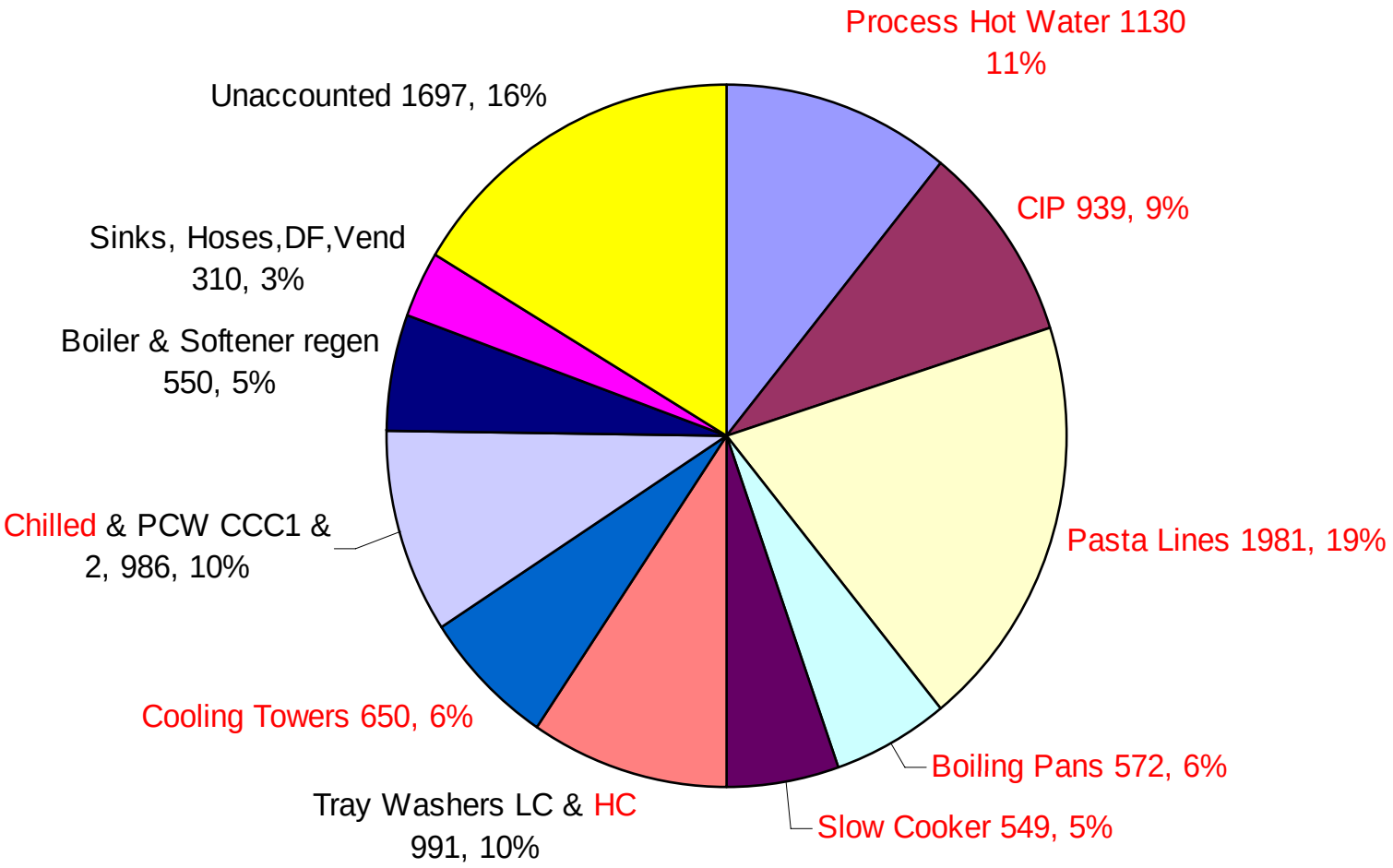

Incoming Water v Site Production
y = 4.9277x + 7351.8
R2 = 0.2719
Water Use m3
Production Tonnes
14000
12000
10000
8000
6000
4000
2000
0
0
100
200
300
400
500
600
700
800
900
1000

Fig 1 Company Water Balance



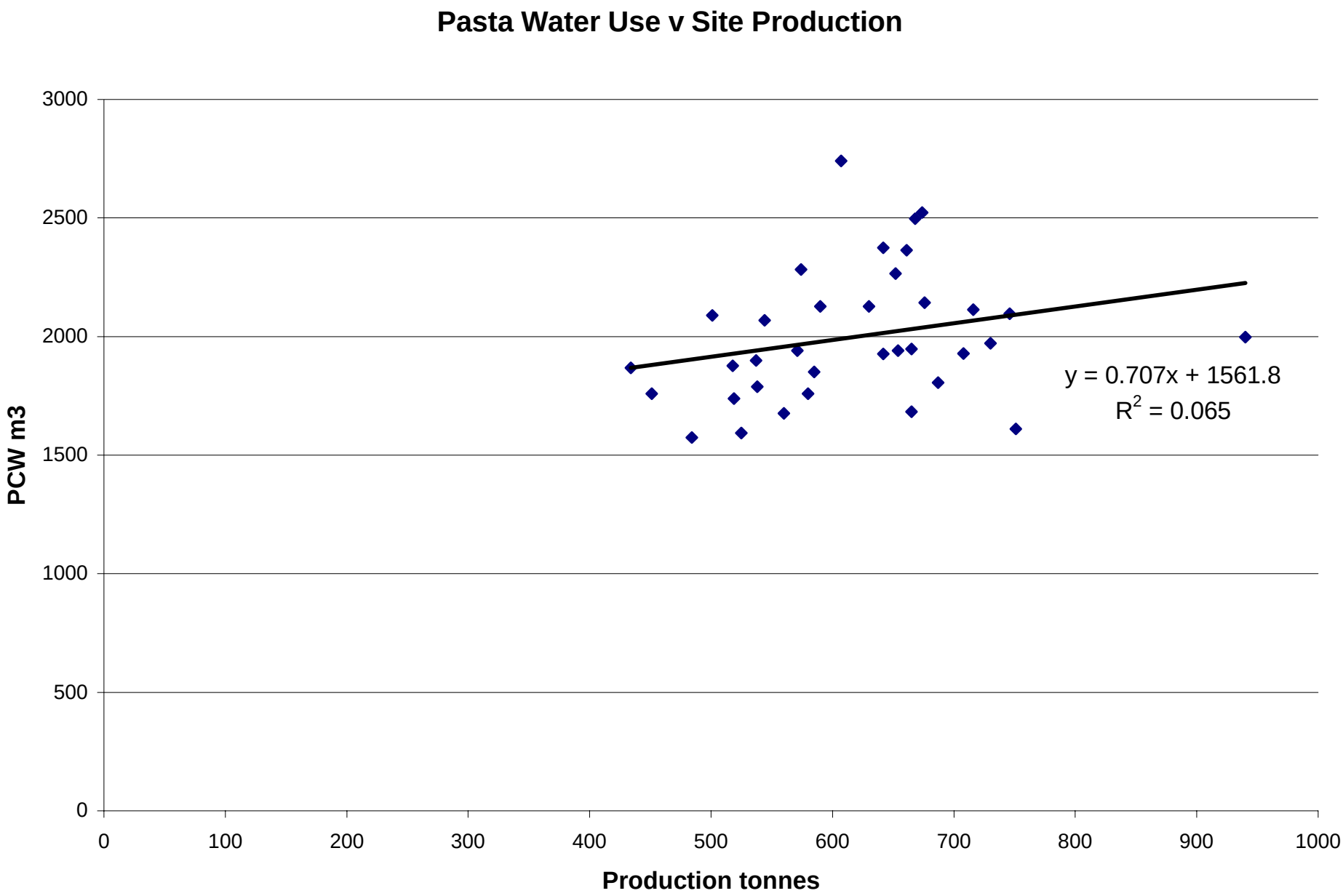

Average Metered Weekly Water Use (Total 10355m3)
Process Hot Water 1130, 11%
CIP 939, 9%
Pasta Lines 1981, 19%
Boiling Pans 572, 6%
Slow Cooker 549, 5%
Water Chiller 186, 2%
HC Tray Wash 241, 2%
Cooling Towers 650, 6%
Not Metered 4107, 40%

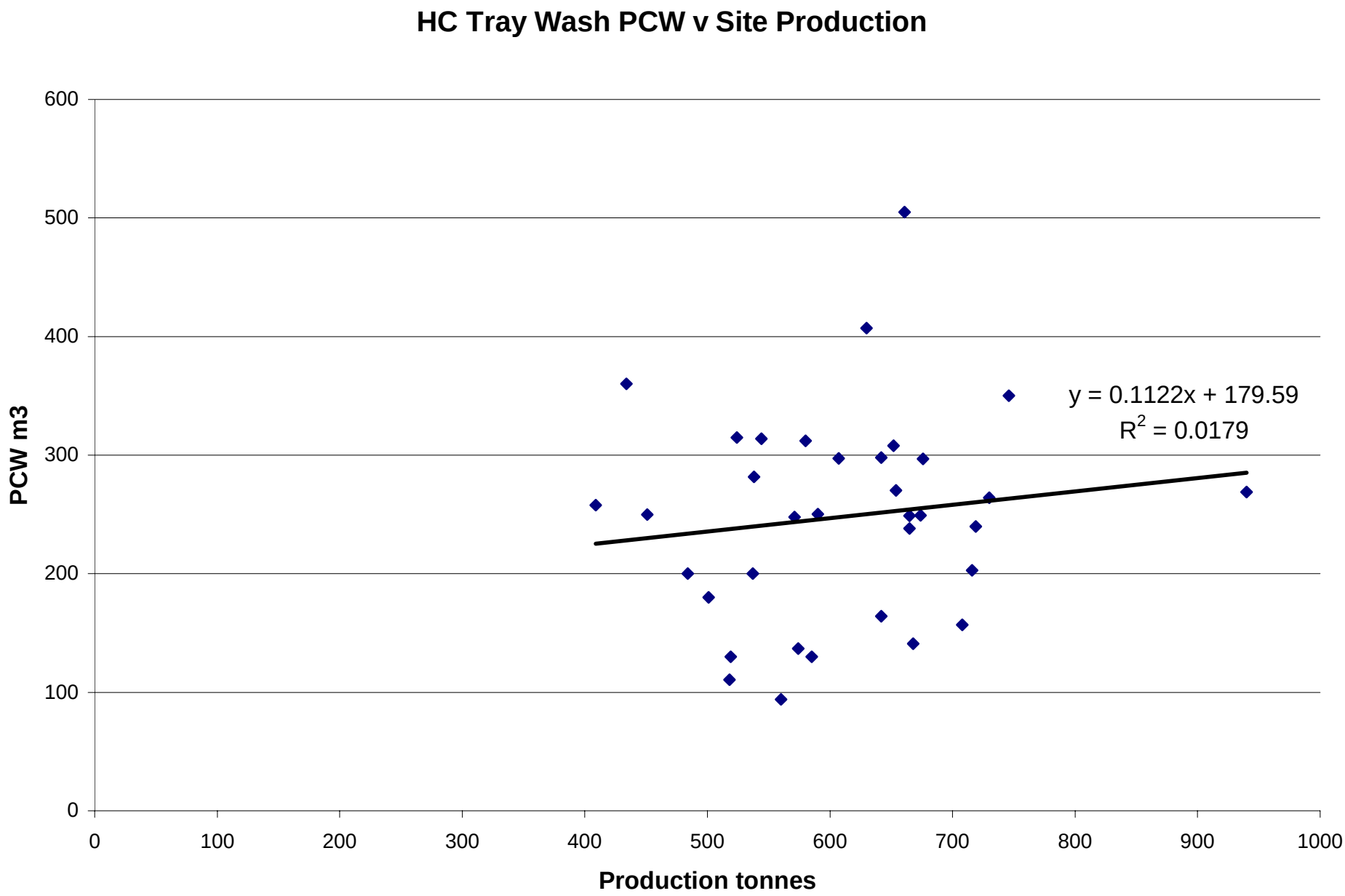
Average Weekly Water Use Metered & Assessed (Total 10,355m3/Week)

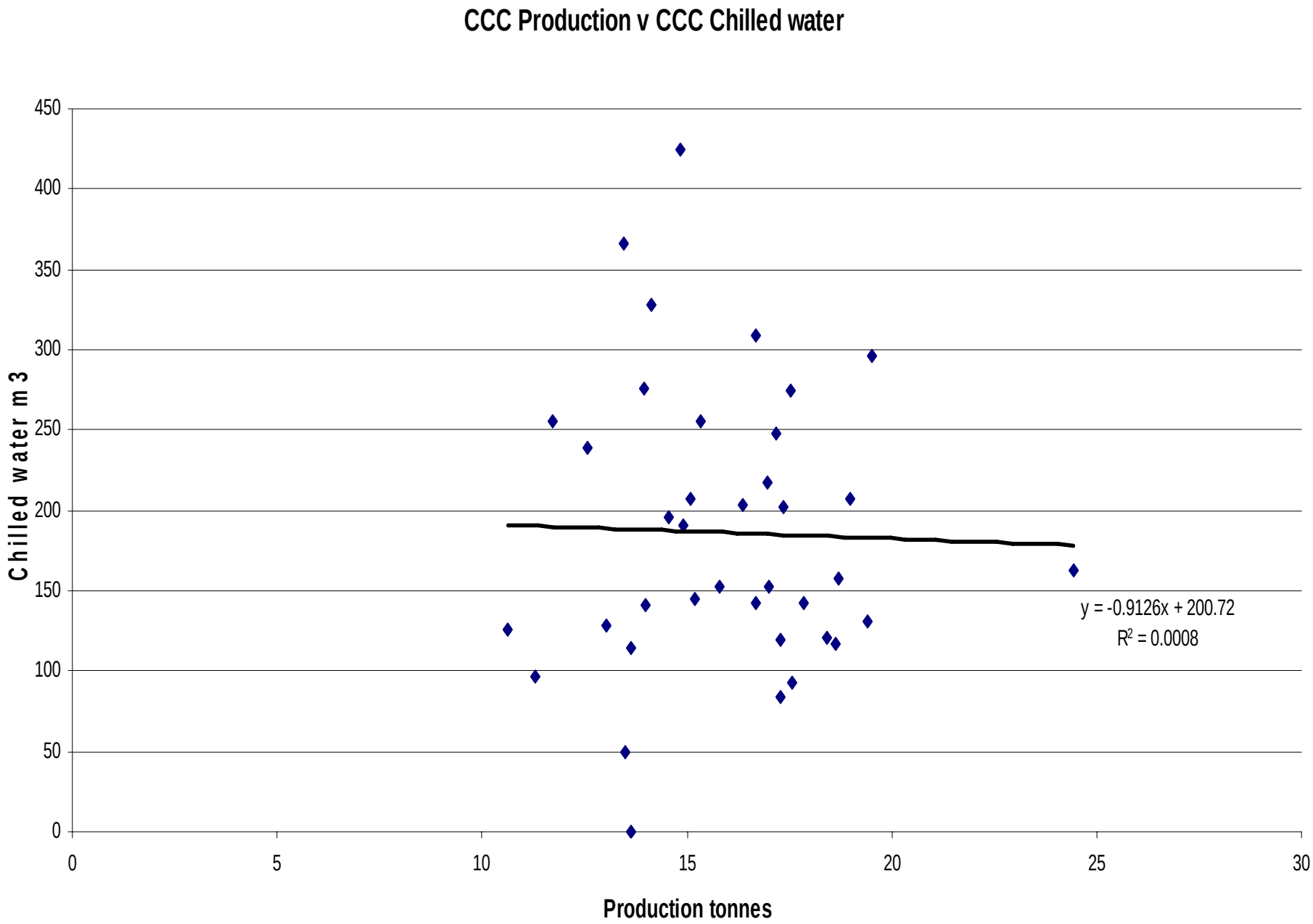


Prioritised Water Users

Pasta Production 19%
Process Hot Water 11%
Tray Washers 11%
CCC PCW & Chilled Water 10%
LC & HC CIP 9%
Boiling Pans 6%
Cooling Towers 6%
Boilers 5%
Slow Cooker 5%


Pasta Water Use v Site Production
PCW m3
3000
2500
2000
1500
1000
500
0
0
100
200
300
400
500
600
700
800
900
1000
Production tonnes
y = 0.707x + 1561.8
R2 = 0.065


HC Tray Wash PCW v Site Production
PCW m3
Production tonnes
y = 0.1122x + 179.59
R2 = 0.0179
0
100
200
300
400
500
600
700
800
900
1000


CCC Production v CCC Chilled water
Chilled water m3
Production tonnes
450
400
350
300
250
200
150
100
50
0
0
5
10
15
20
25
30
y = -0.9126x + 200.72
R2 = 0.0008

Case Study 4 – “Colourful Yarns”

Sustainable Water Use and Sustainable Business

Yarn/Dye Type	Water Standards		Steam Standards		Electricity Standards		Utility Cost Total	Dye Process Time
	litres/ kg	£/kg	kg/kg	£/kg	kWh/kg	£/kg	£/kg	Minutes
1	63.2	0.04	8.48	0.12	0.553	0.018	0.178	512
2	31.6	0.02	4.2	0.06	0.286	0.009	0.089	250
3	23.7	0.02	3.65	0.05	0.244	0.008	0.078	209
4	39.5	0.03	8.8	0.12	0.367	0.012	0.162	334
5	23.7	0.02	7.99	0.11	0.532	0.017	0.147	463
6	31.6	0.02	7.34	0.10	0.402	0.013	0.133	357

Table 1 Dying Standards Full Machines

Thank You

I hope my presentation achieved its objectives and you found it interesting.

I would be grateful if you could complete and return the Envirowise Action Plans.

Colin Woods

Colin Woods Associates

Advisor to Envirowise