

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

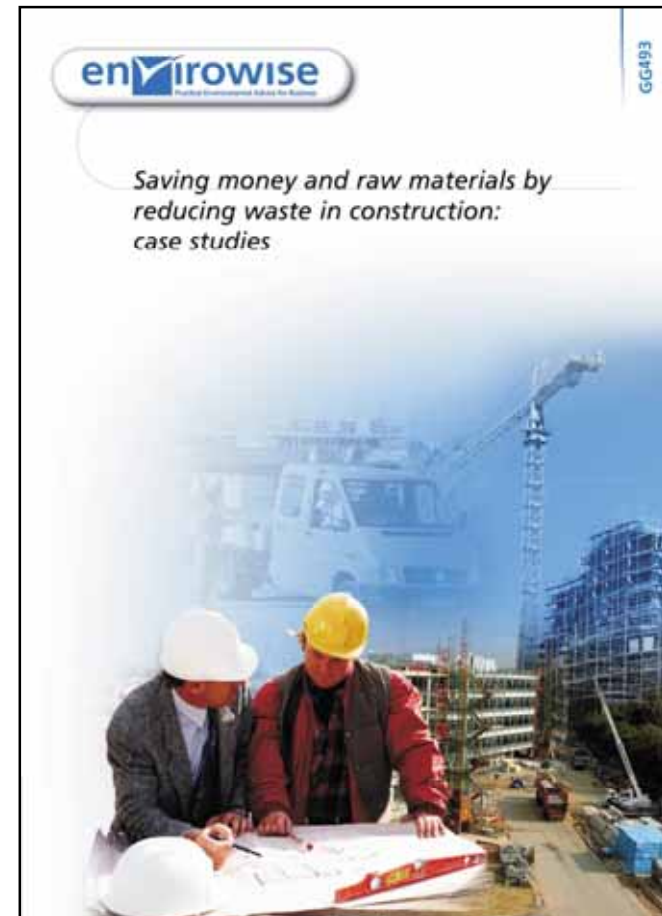
About Envirowise

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- 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

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)



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.

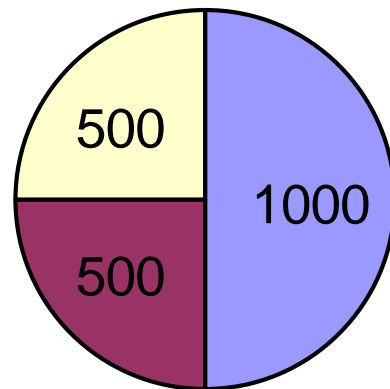
Also to reinforce the worth of water reduction and cost saving measures through case studies

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)

United Utilities Dry Weather Potable Water Demand (total 2000MI/day)



- Household demand
- Non-household demand

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

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

Hospitals

Prisons

Public buildings

Industrial units /factories

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

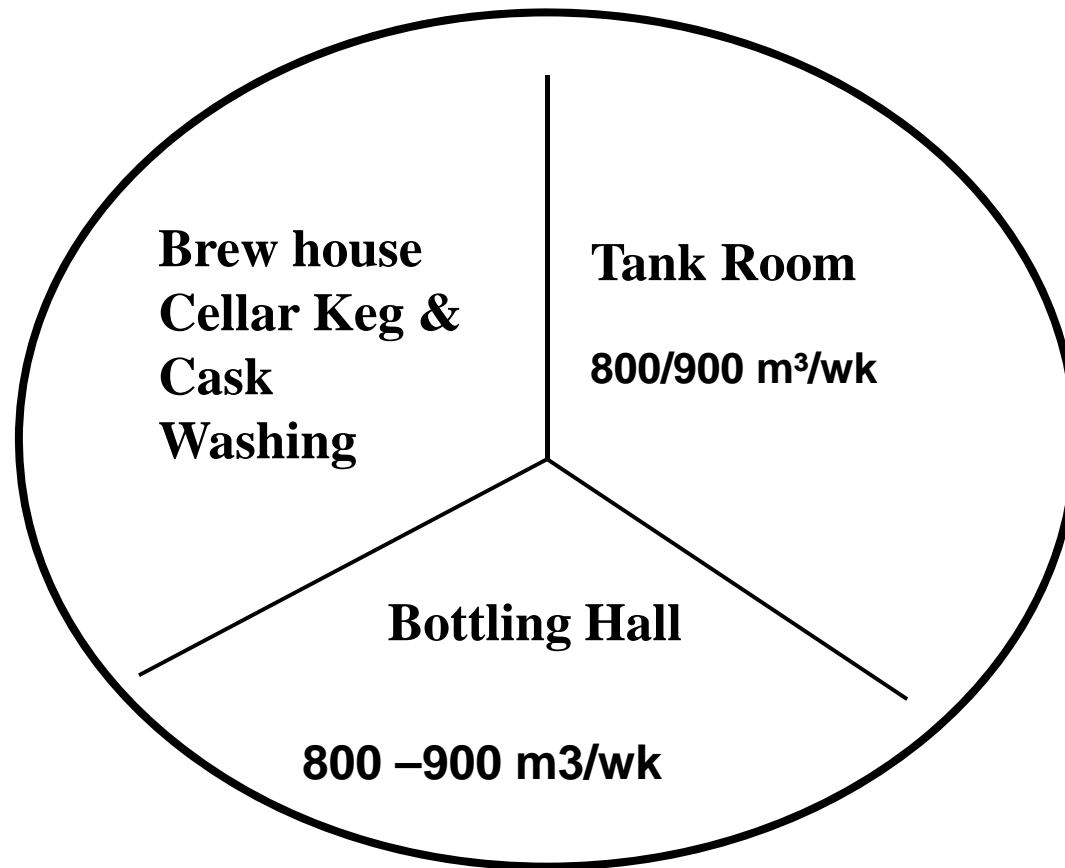
Stage 2

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

Stage 3

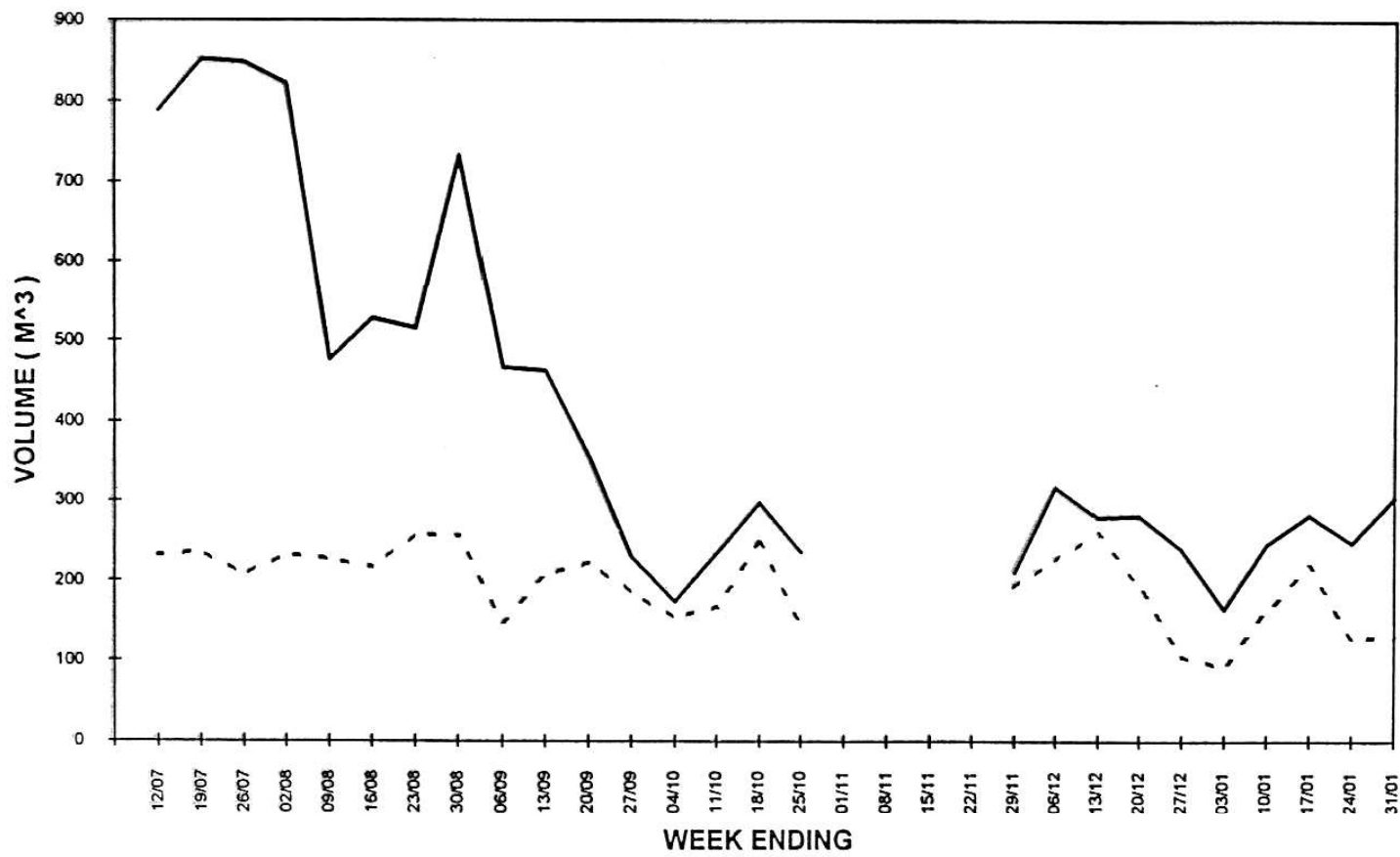
Establish water management practices Analyse water usage and **implement change**

Breakdown of Water Usage



Water Usage - 2,500 – 3,000 m³/wk

TANK ROOM



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

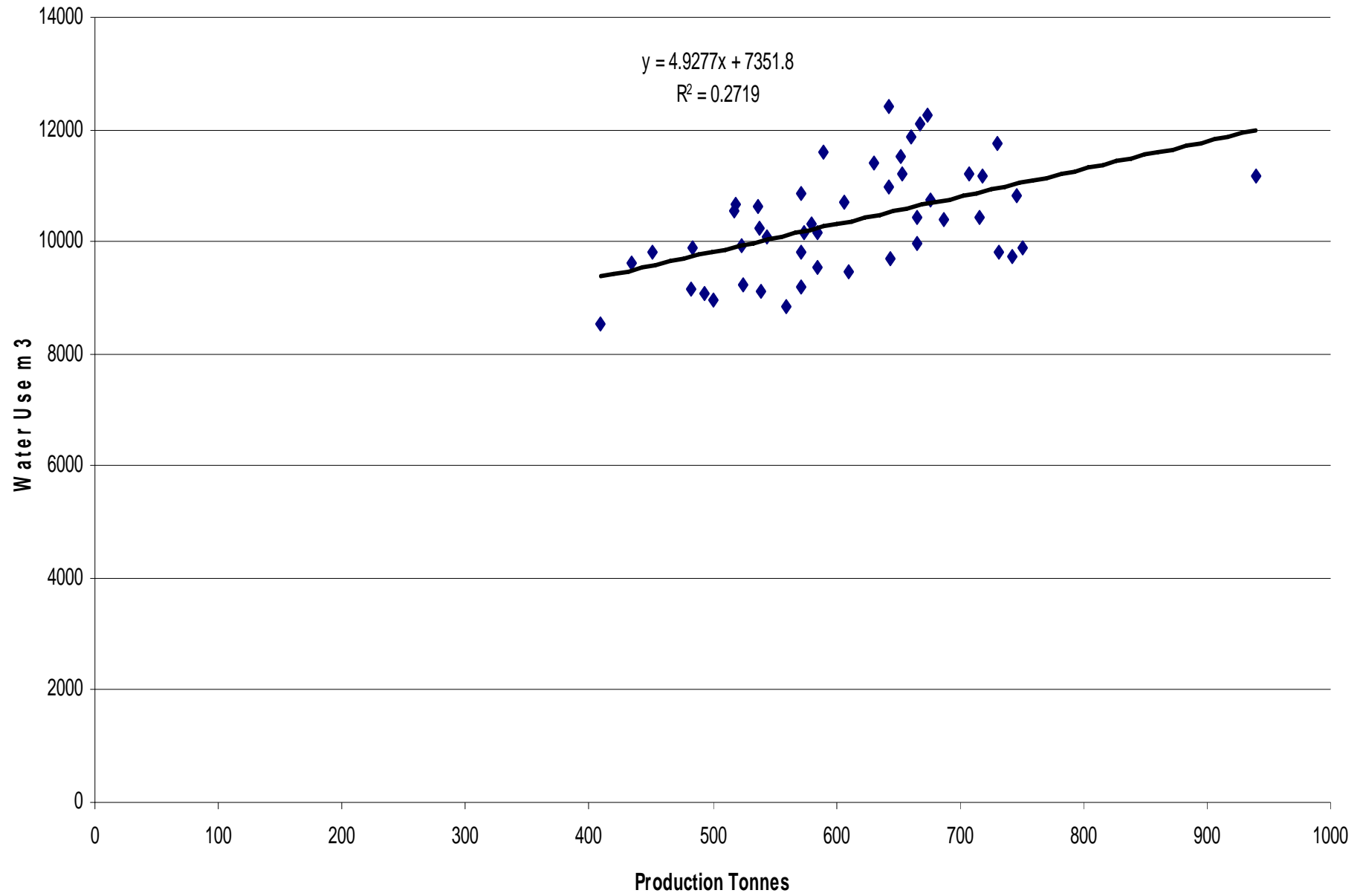
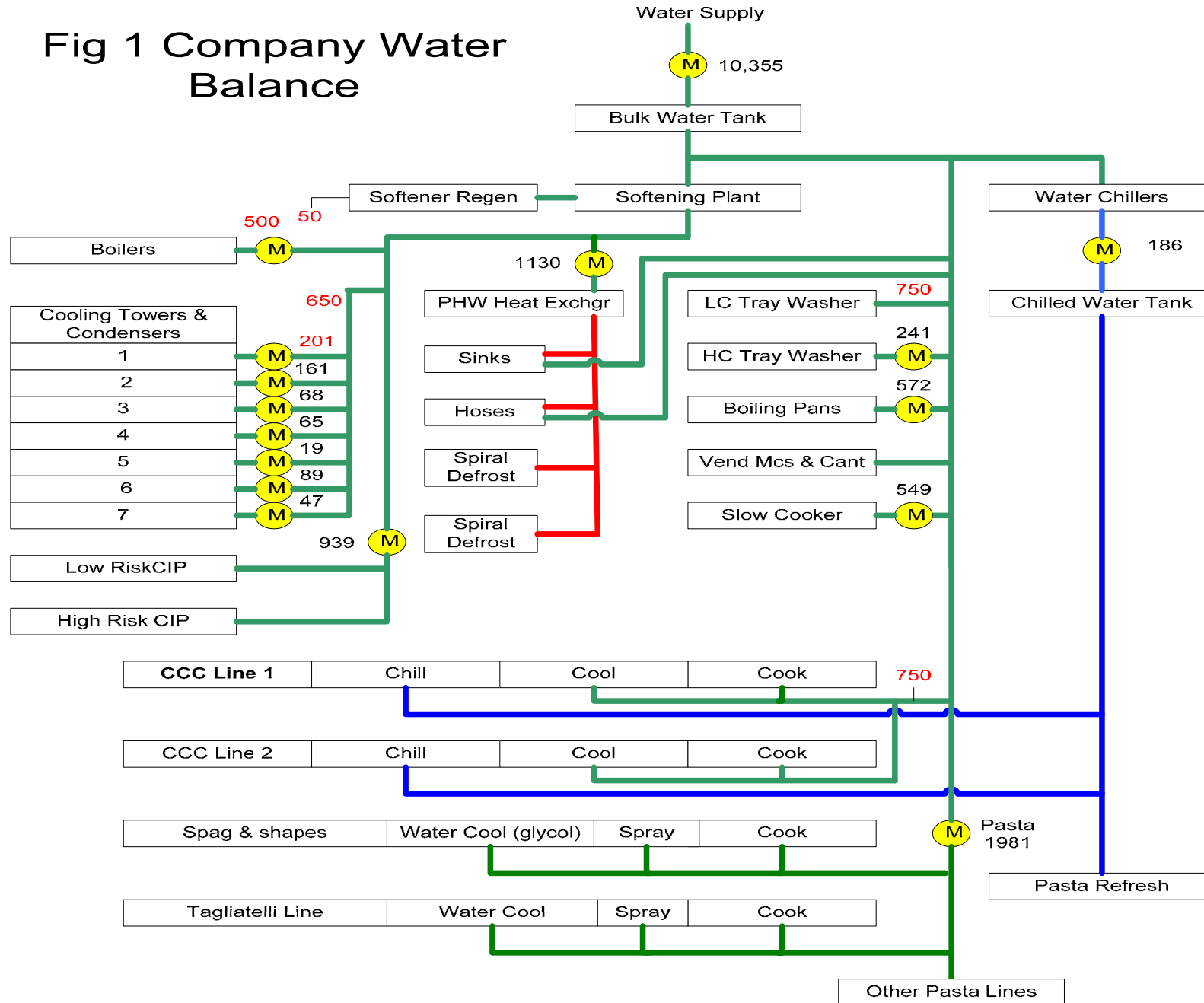
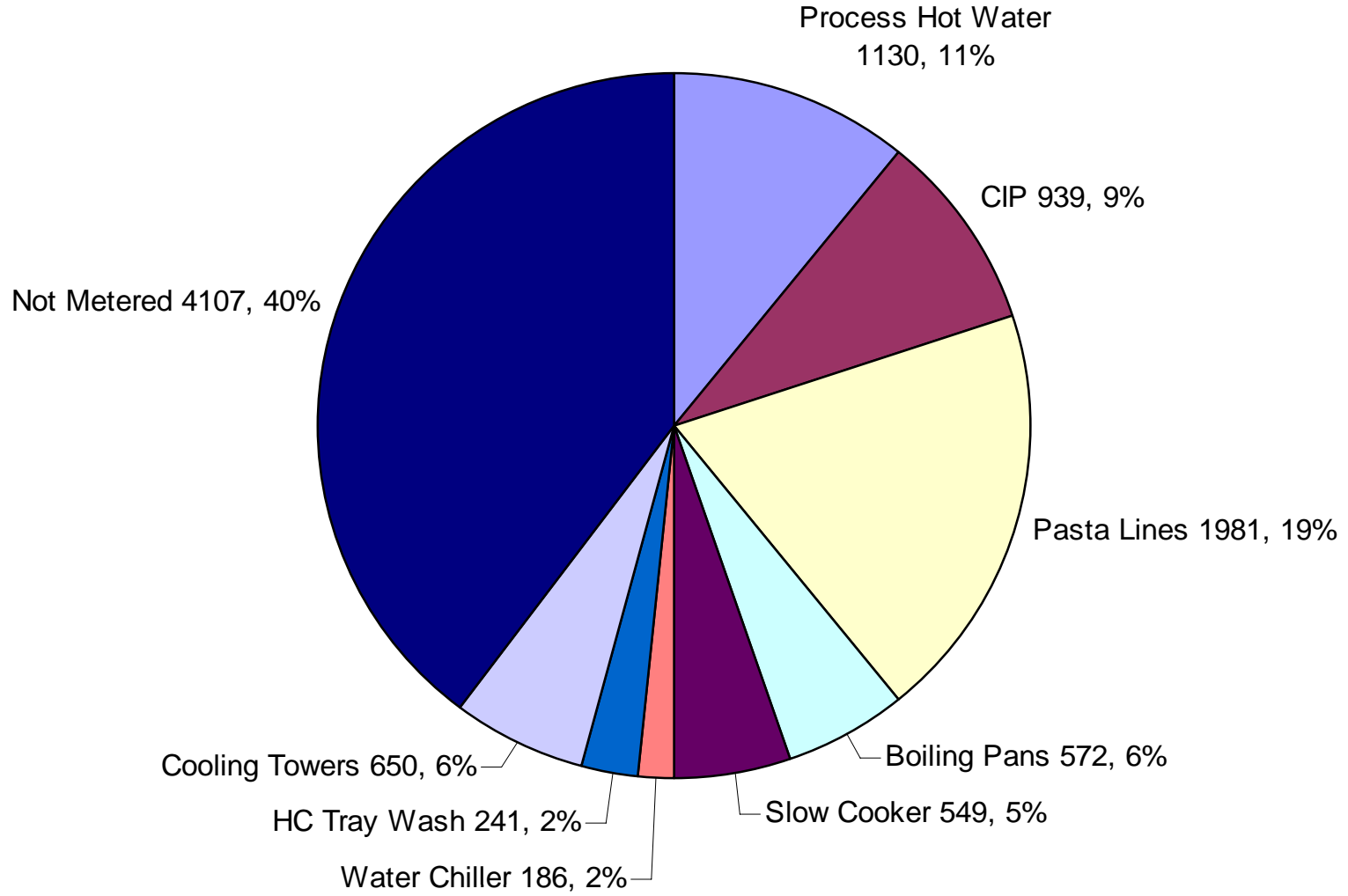


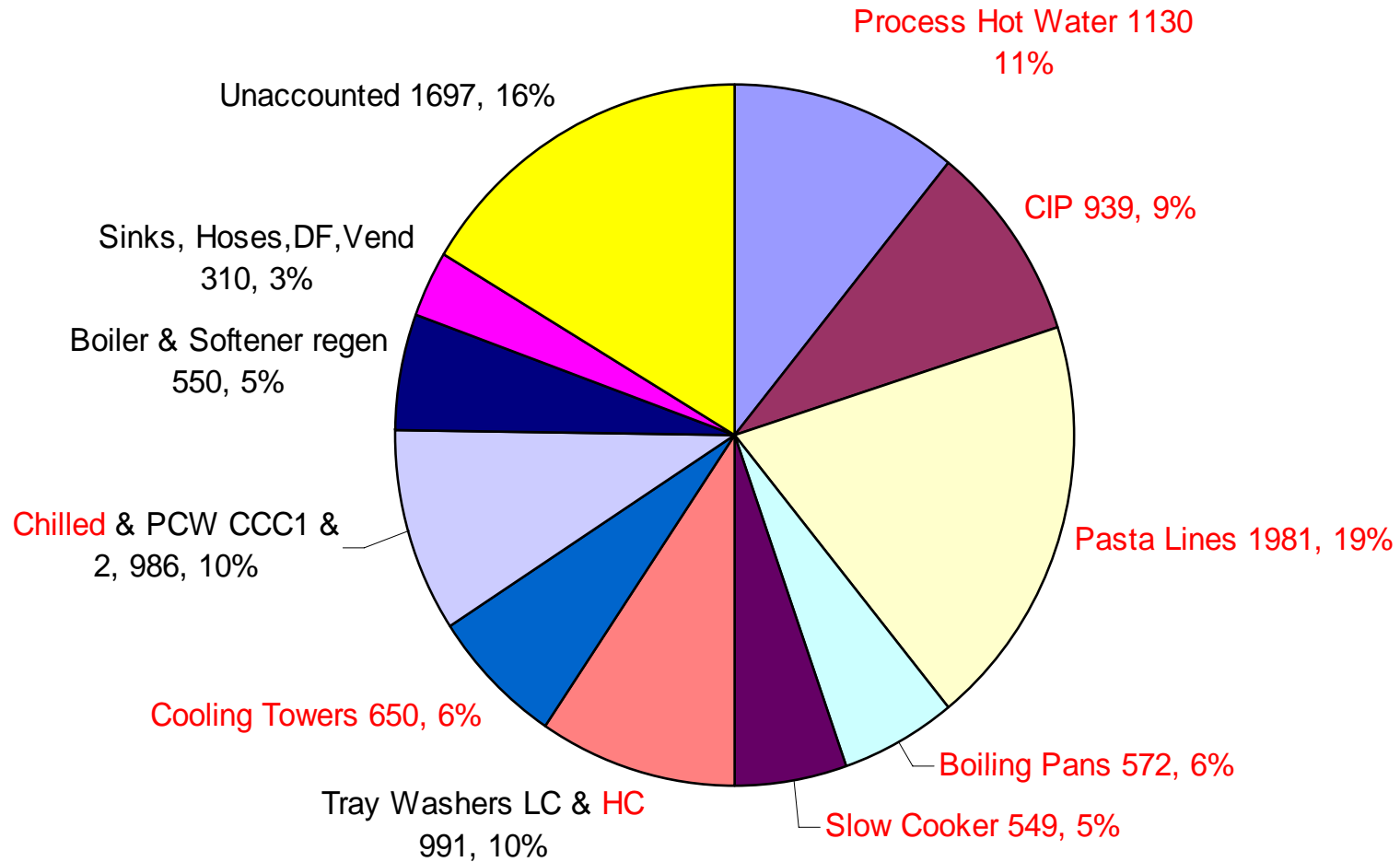
Fig 1 Company Water Balance



Average Metered Weekly Water Use (Total 10355m3)



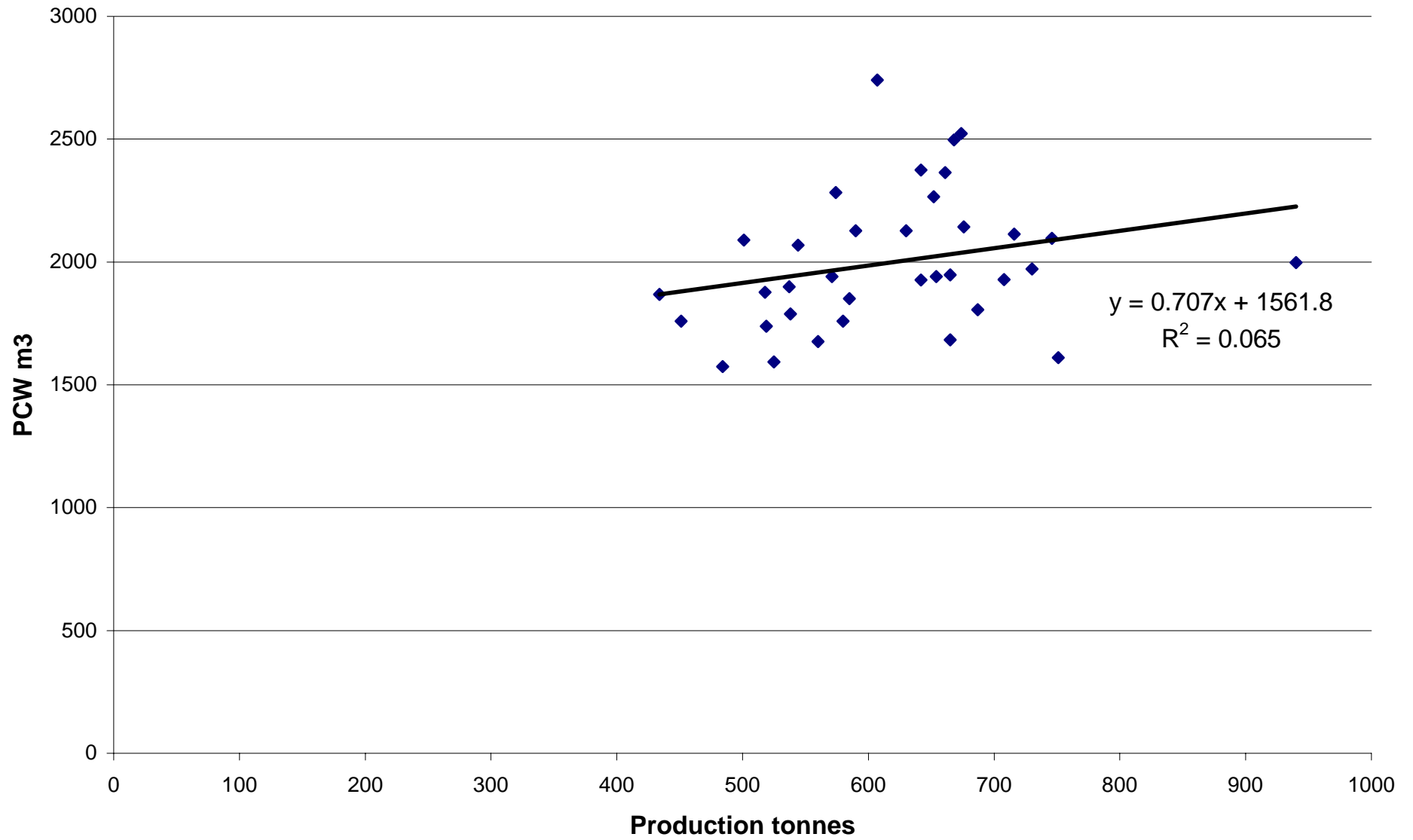
Average Weekly Water Use **Metered** & Assessed (Total 10,355m³/Week)



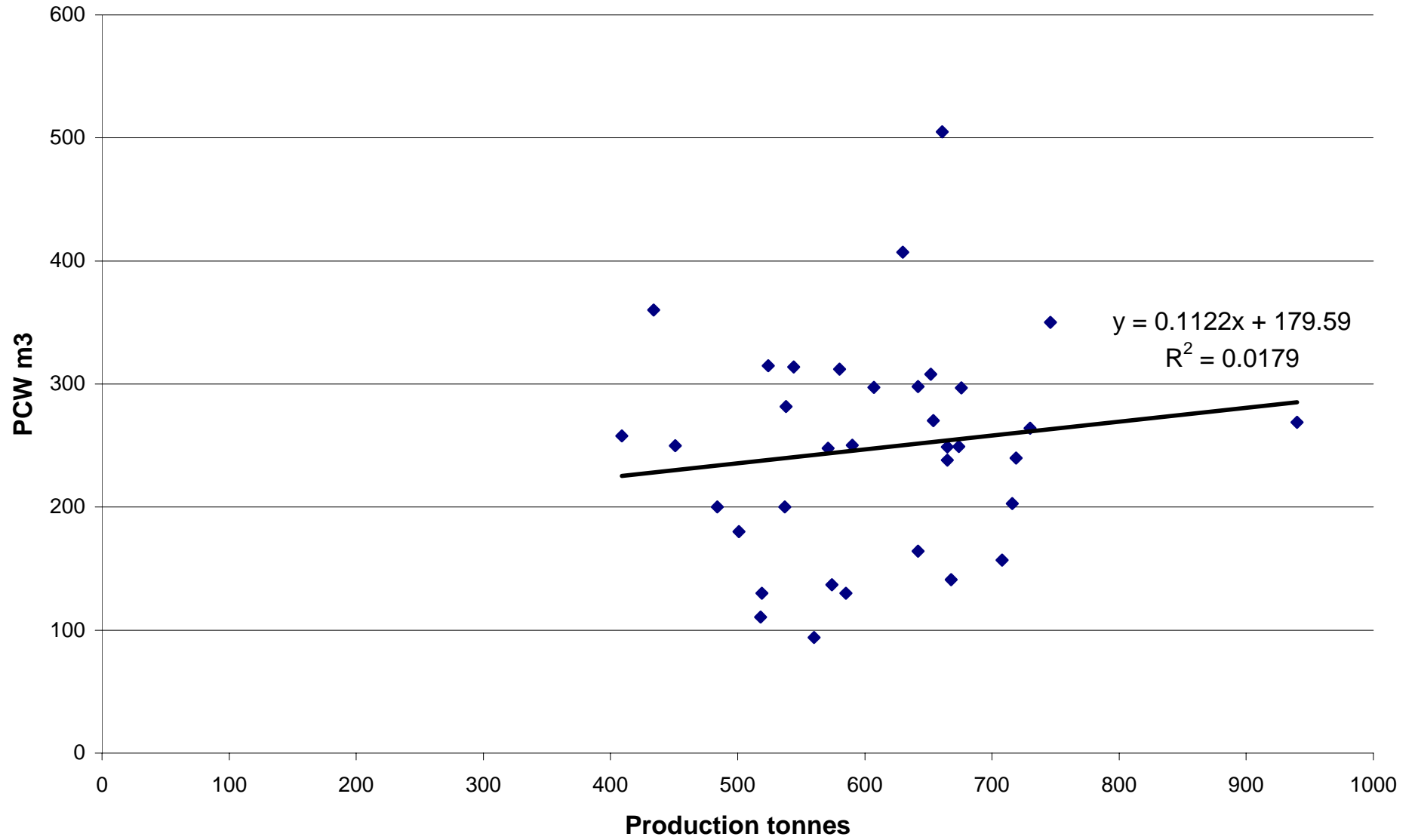
Prioritised Water Users

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%

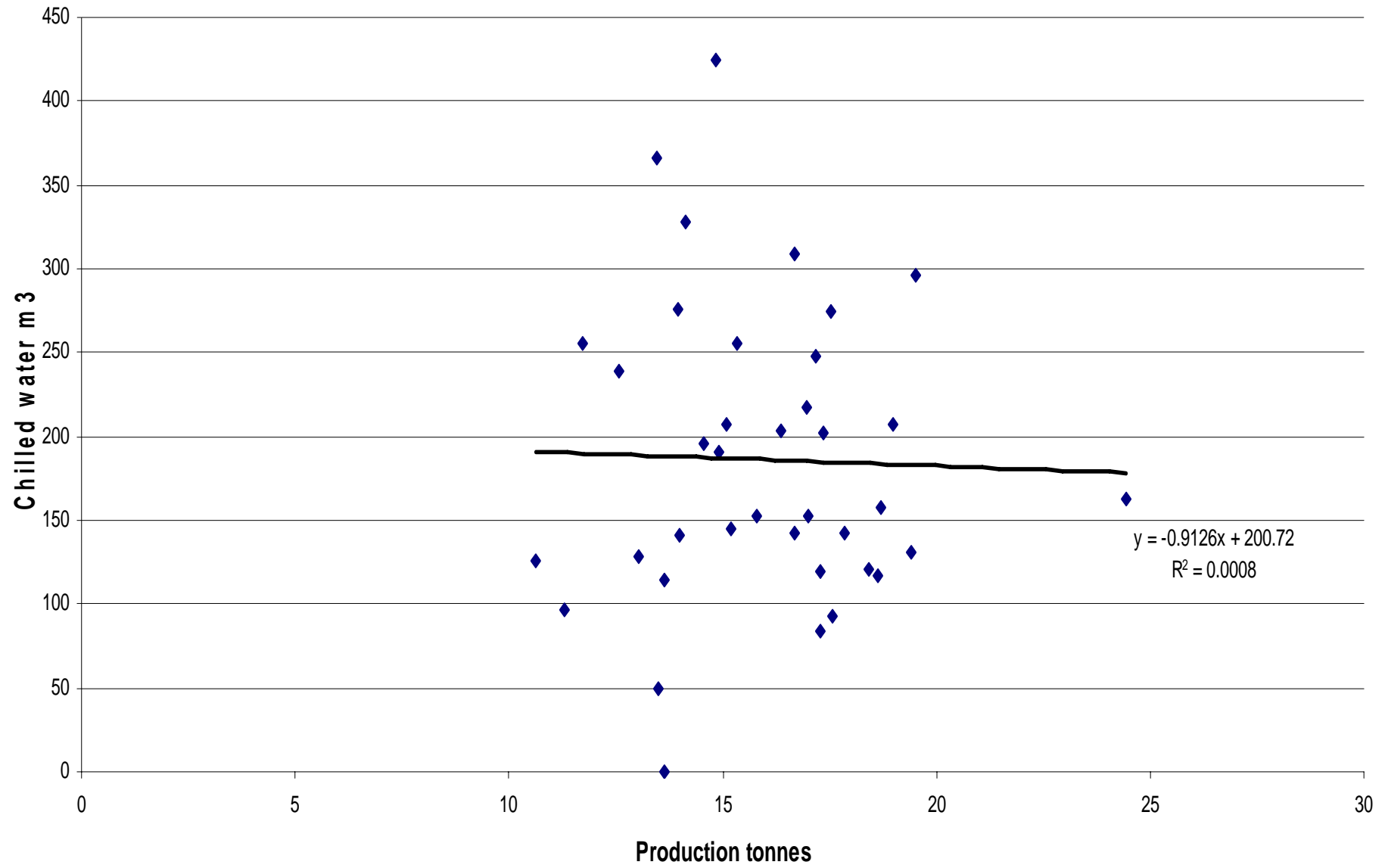
Pasta Water Use v Site Production



HC Tray Wash PCW v Site Production



CCC Production v CCC Chilled water



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 Dyeing 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