# Quantifying flushes, gushes and slushes

## Water efficiency evidencing

Keith Ponsonby

callidus
Elevated thinking

2 3 6 28 i 1.618

$\pi$ 3.14159

**INTERESTING NUMBERS!**

# Routine data

# Opportunistic

2 3 6 28 1.618

$\pi$ 3.14159

# Insight

WE
SEE
THINGS
IN DATA
THAT OTHERS
MISS REVEALING
UNDERLYING TRENDS
INSIGHTS AND UNDERSTANDING

ESSEX&SUFFOLK WATER living water

$H_2$eco Help the planet, help your wallet.

mouchel building great relationships

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# $H_2$eco PROJECTS ARE COMPLEX IN NATURE | callidus

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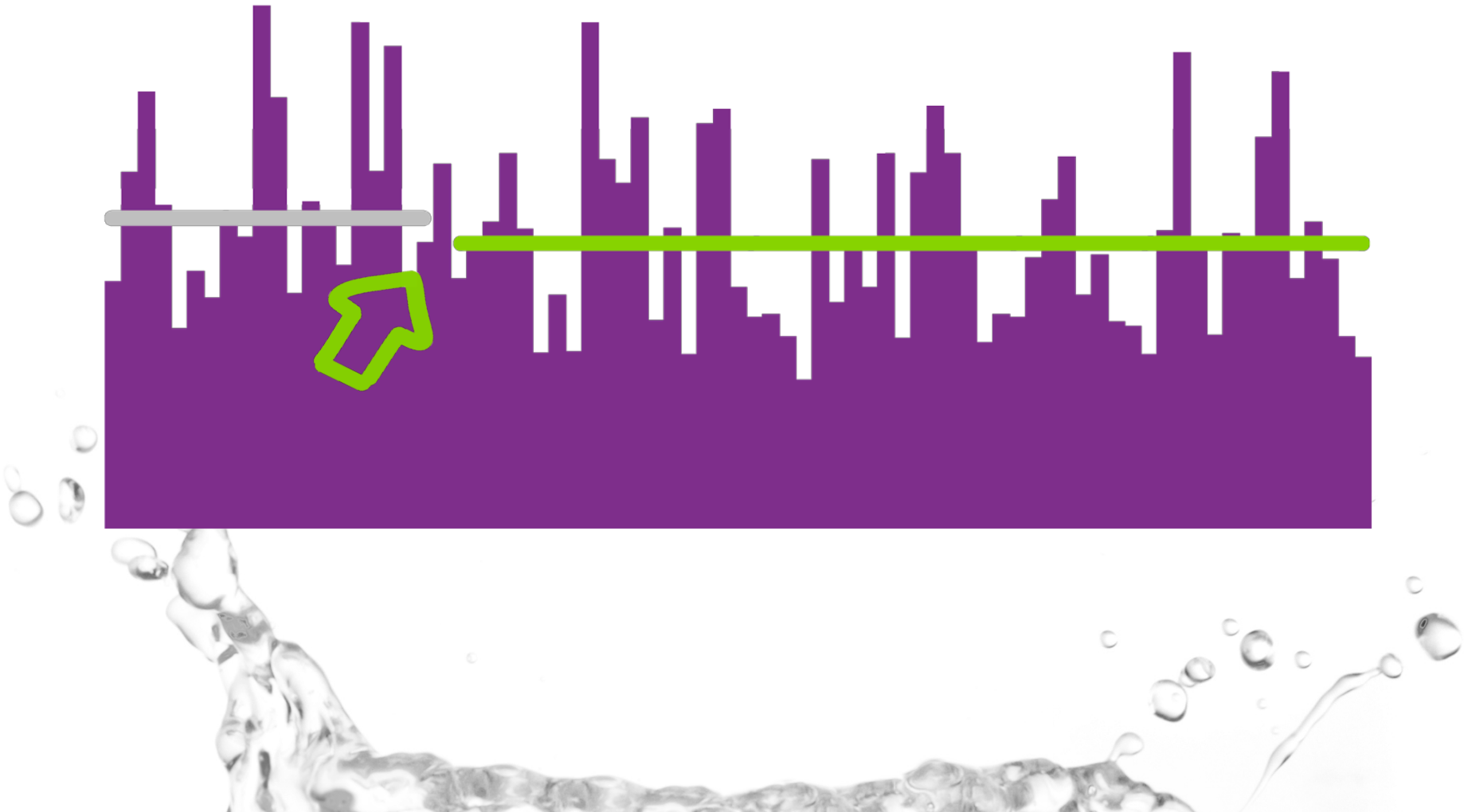
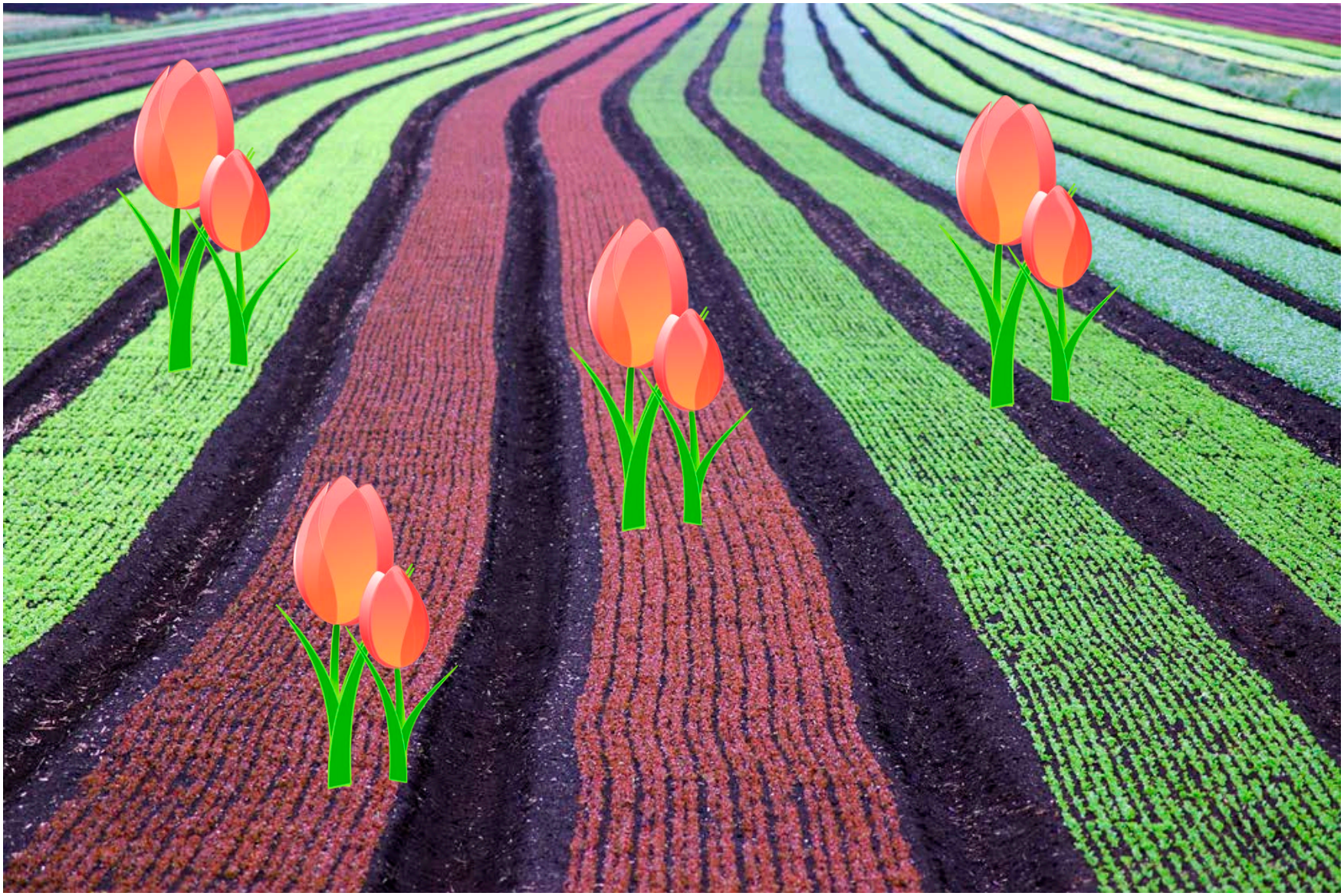
Elevated thinking

# $H_2$eco PROJECTS ARE COMPLEX IN NATURE | callidus



# STATS ON LARGE SAMPLE SIZES PROVIDE OPPORTUNITY

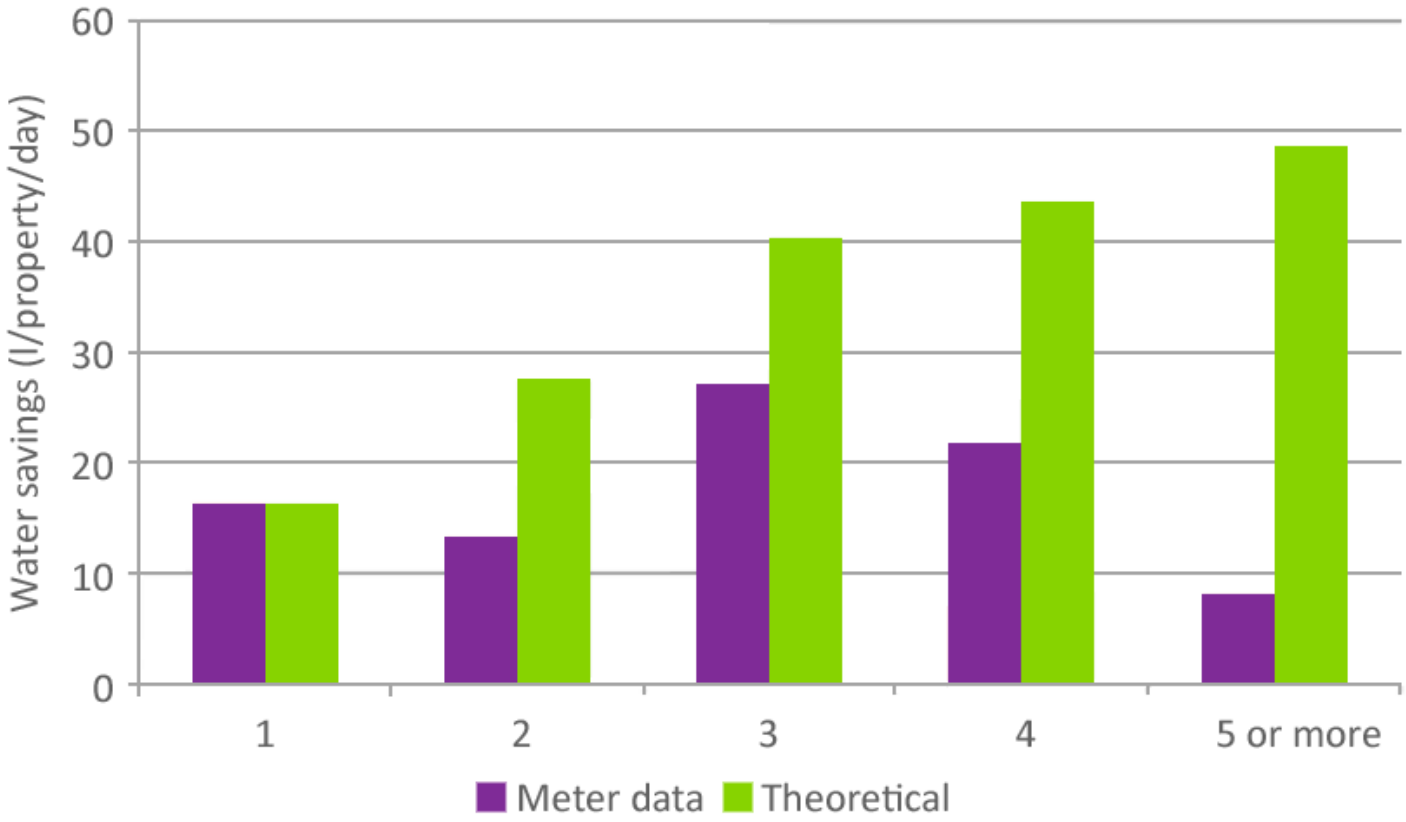


# REGRESSION ANALYSIS EXTRACTS MORE INSIGHT

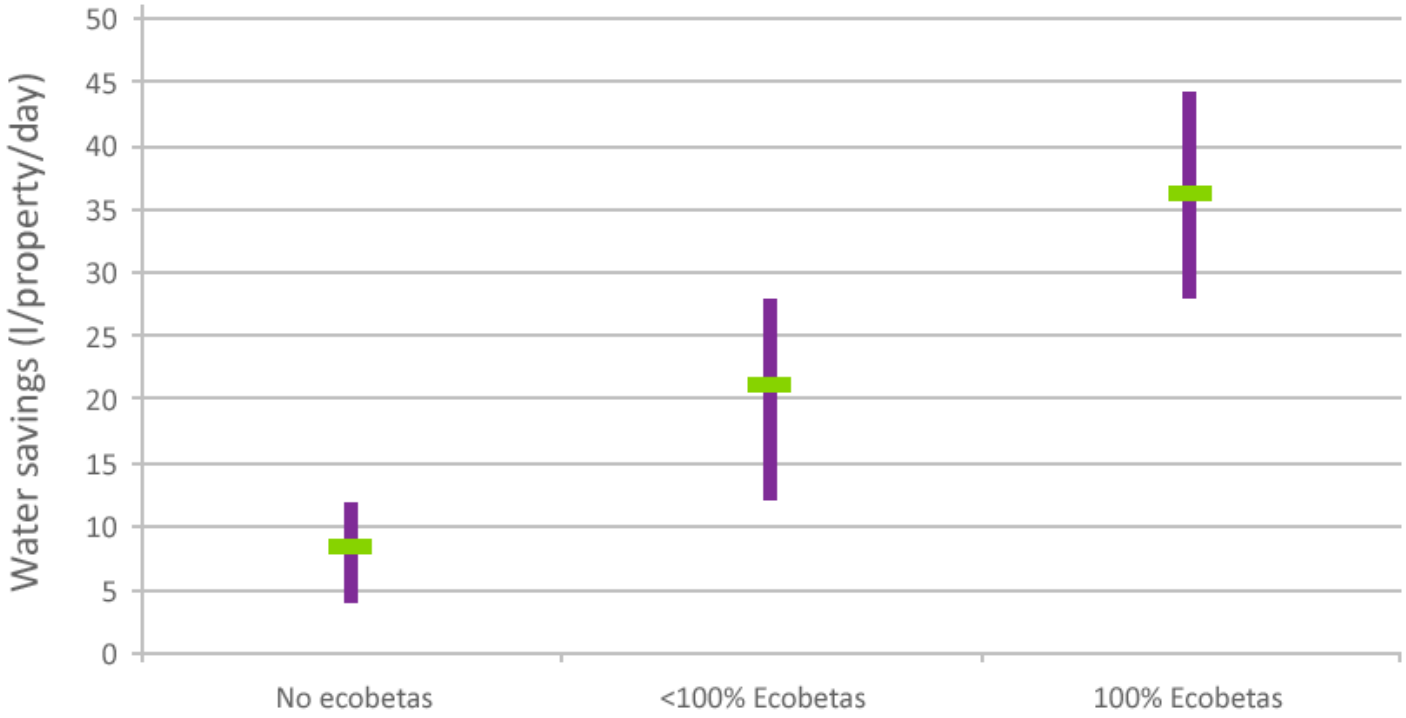
- **Ecobeta: 17**
- **Save-A-Flush: 6**
- **Showerhead: 11**
- **Miracle Tap: 4**
- **Tap inserts: 4**

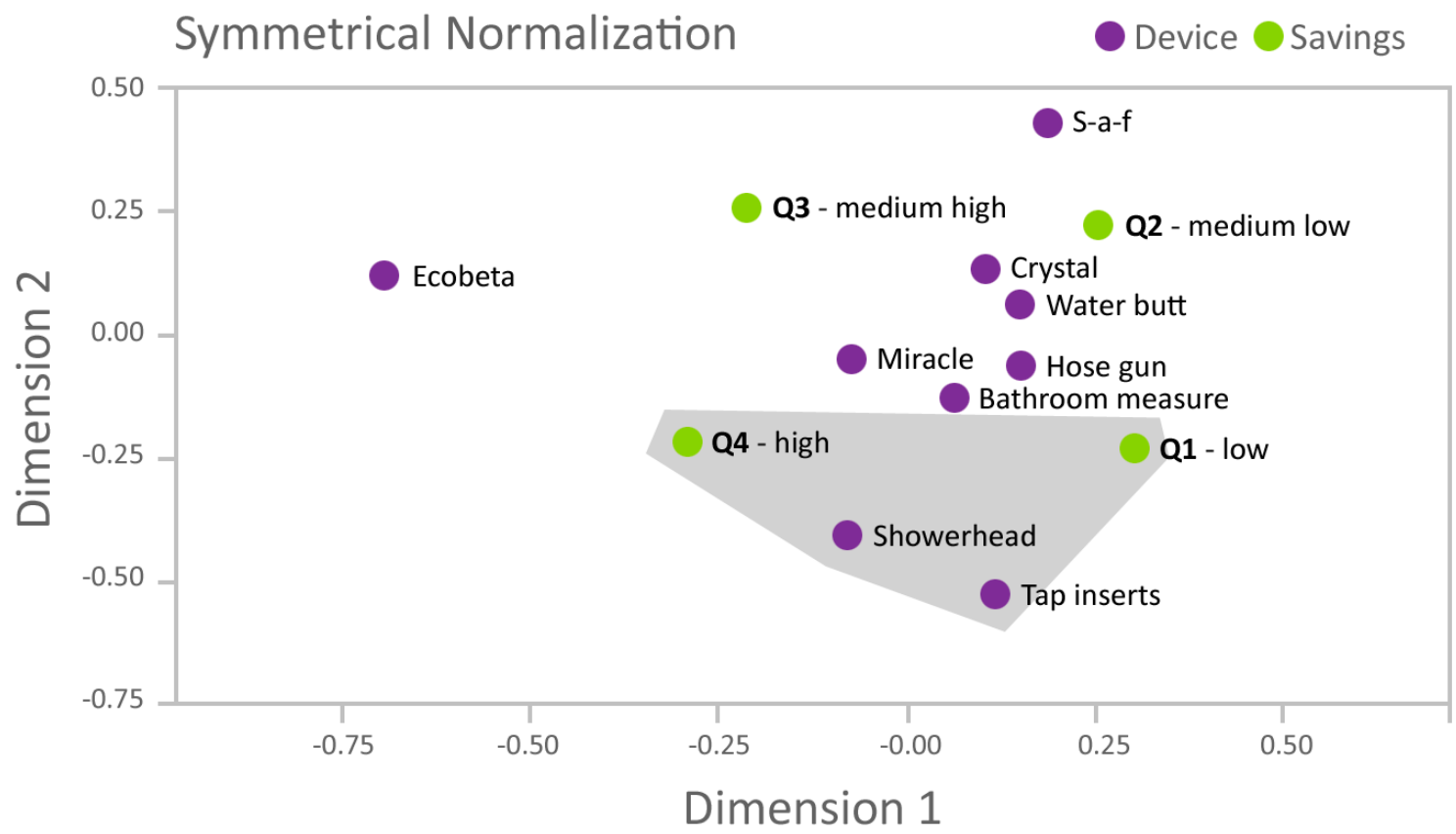
LITRES • PER DEVICE • PER DAY

# OTHER STATISTICAL TECHNIQUES HELP



# OTHER STATISTICAL TECHNIQUES HELP




Symmetrical Normalization
Device
Savings
0.50
0.25
0.00
-0.25
-0.50
-0.75
Dimension 2
S-a-f
Q3 - medium high
Q2 - medium low
Ecobeta
Crystal
Water butt
Miracle
Hose gun
Bathroom measure
Q4 - high
Q1 - low
Showerhead
Tap inserts
-0.75
-0.50
-0.25
-0.00
0.25
0.50
Dimension 1

Early phase **lower** savings. More recent phase **greater** savings.

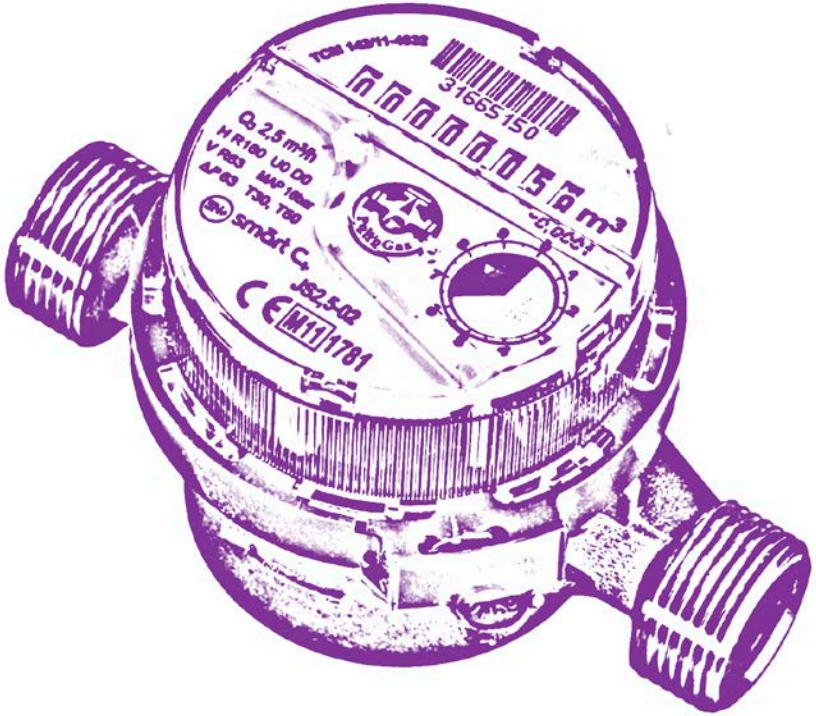
- **Ecobeta: 17** grown to **22**
- **Save-A-Flush: 6** grown to **8**
- **Showerhead: 11** grown to **14**
- **Tap inserts: 4** grown to **7**

LITRES • PER DEVICE • PER DAY

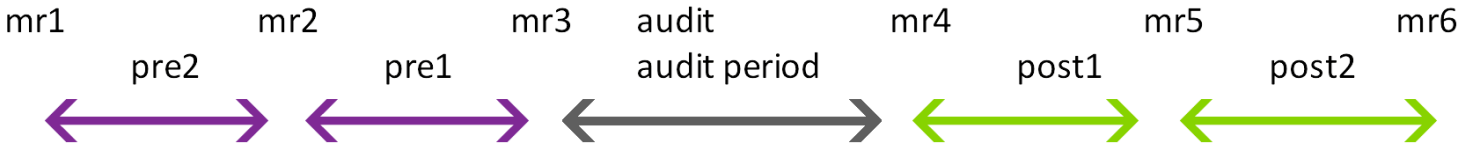
**Overall Households: 19** grown to **31**

LITRES • PER PROPERTY • PER DAY

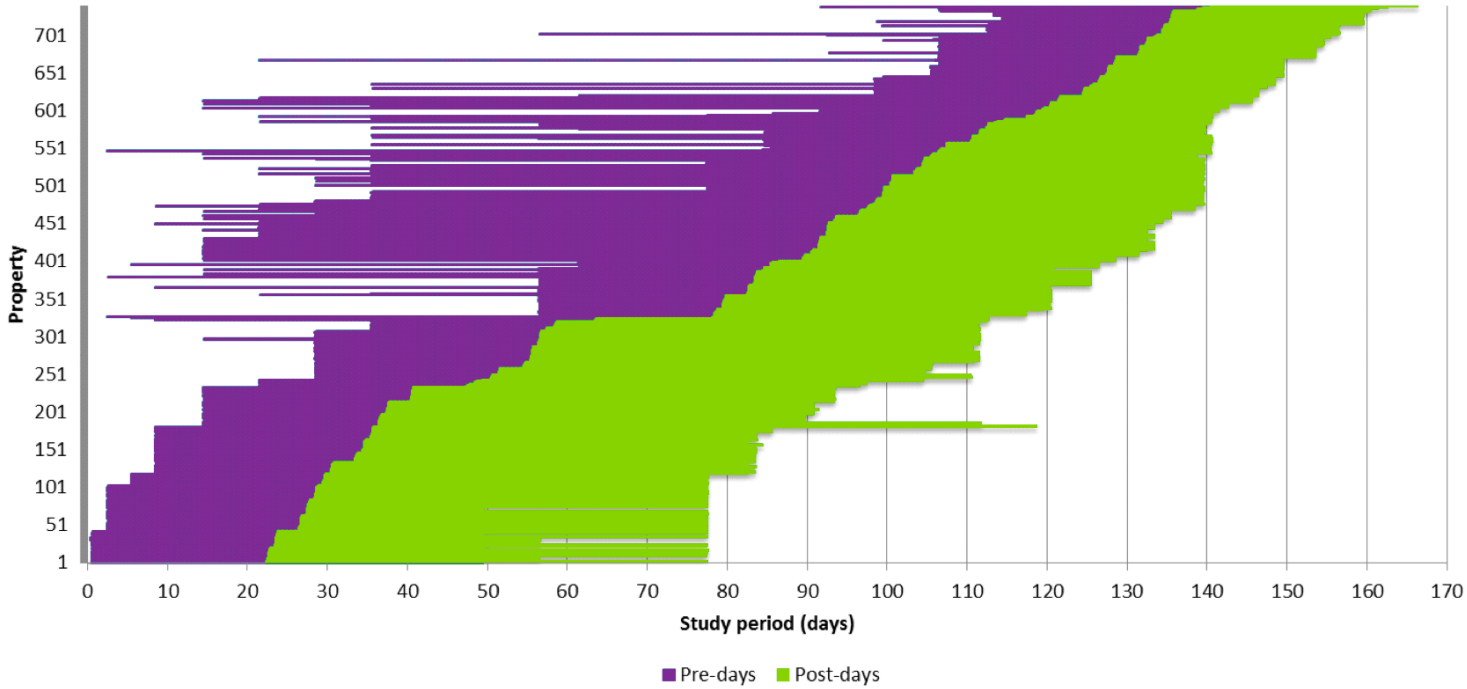
# OPPORTUNISTIC METER BILLED READS



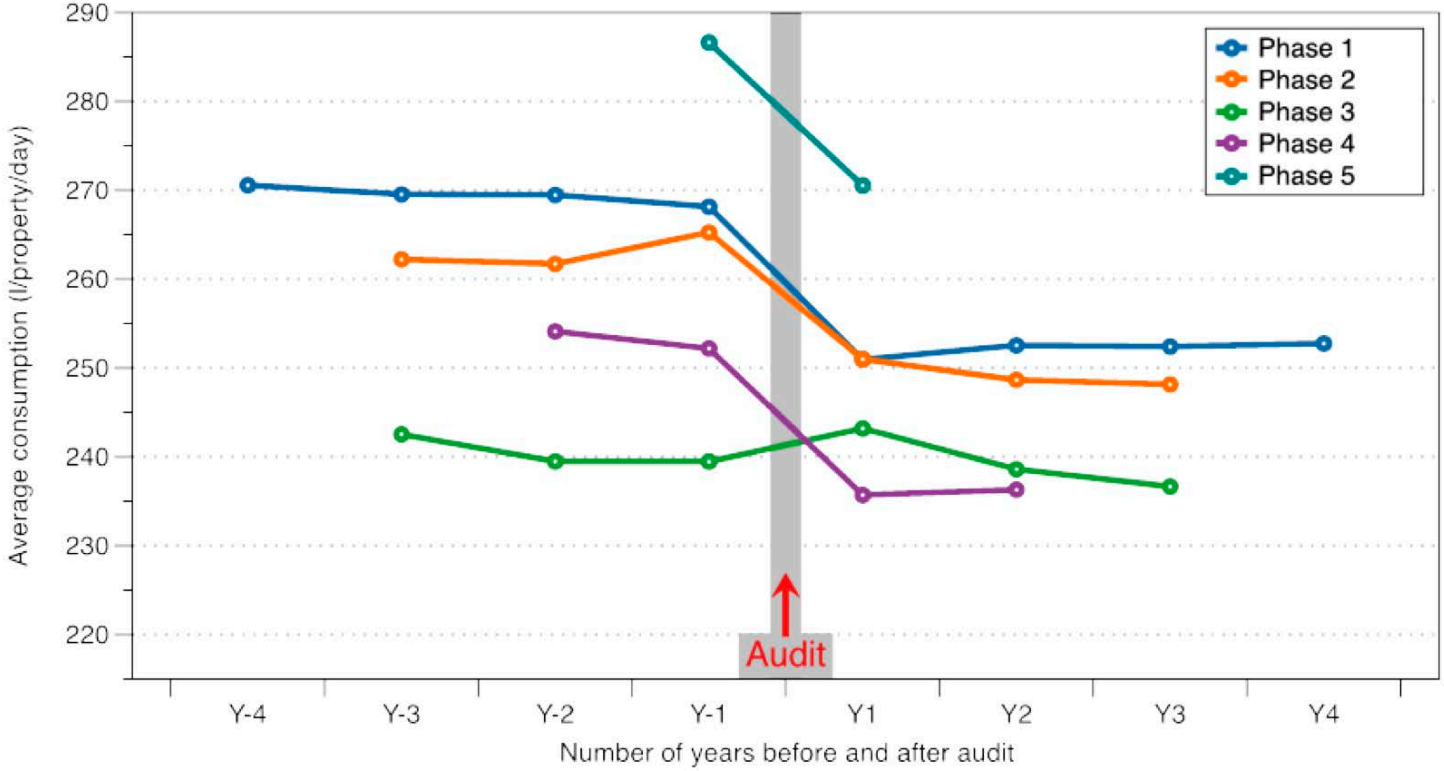
## Meter billing read periods




## Interventions at individual properties



## **Long term** savings **consistent** and **sustainable** over several years



# siloeπe


## MICRO-COMPONENTS
## OWNERSHIP, VOLUME, FREQUENCY AND TIME

| DEVICE | O V F T | DEVICE | O V F T |
|---|---|---|---|
| WC | ✓ | SHOWER | ✓ |
| BATH | ✓ | INDOOR TAP | ✓ |
| WASHING MACHINE | ✓ | DISH WASHER | ✓ |
| WATER SOFTENER | ✓ | HOSE PIPE/SPRINKLER | ✓ |
| OTHER OUTSIDE USE | ✓ | LEAKAGE/WASTAGE | ✓ |

**Greater than 90% of water use is identified.**

# MICRO-COMPONENT EVENT STATS | callidus

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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | | | | | | | | | | | |
| 3 | | | | | | | | | | | |
| 4 | site_id | event_id | date_start | date_end | device_id | device_name | duration_hr | duration_min | duration_sec | volume_l | mean_flow_lmin |
| 5 | 21236821 | 1 | 05/03/2014 14:41 | 05/03/2014 14:42 | 2 | Toilet | 0 | 0 | 57 | 5.5 | 5.72 |
| 6 | 21236821 | 2 | 05/03/2014 14:42 | 05/03/2014 15:18 | 1 | Tap | 0 | 35 | 41 | 1.5 | 0.04 |
| 7 | 21236821 | 3 | 05/03/2014 15:18 | 05/03/2014 15:19 | 2 | Toilet | 0 | 0 | 59 | 5.5 | 5.53 |
| 8 | 21236821 | 4 | 05/03/2014 15:19 | 05/03/2014 17:20 | 0 | Unknown | 2 | 0 | 57 | 3 | 0.02 |
| 9 | 21236821 | 5 | 05/03/2014 17:20 | 05/03/2014 18:46 | 6 | Dish W | 1 | 25 | 37 | 13 | 0.15 |
| 10 | 21236821 | 6 | 05/03/2014 17:48 | 05/03/2014 17:50 | 3 | Shower | 0 | 1 | 59 | 18 | 9.03 |
| 11 | 21236821 | 7 | 05/03/2014 21:22 | 05/03/2014 21:23 | 2 | Toilet | 0 | 1 | 10 | 6 | 5.1 |
| 12 | 21236821 | 8 | 05/03/2014 22:29 | 05/03/2014 22:30 | 1 | Tap | 0 | 1 | 0 | 2 | 1.98 |
| 13 | 21236821 | 9 | 05/03/2014 23:48 | 05/03/2014 23:51 | 2 | Toilet | 0 | 2 | 57 | 6.5 | 2.2 |
| 14 | 21236821 | 10 | 05/03/2014 23:51 | 06/03/2014 08:12 | 1 | Tap | 8 | 21 | 9 | 1.5 | 0 |
| 15 | 21236821 | 11 | 06/03/2014 08:12 | 06/03/2014 08:14 | 2 | Toilet | 0 | 1 | 39 | 6.5 | 3.91 |
| 16 | 21236821 | 12 | 06/03/2014 08:14 | 06/03/2014 08:26 | 0 | Unknown | 0 | 12 | 33 | 0.5 | 0.04 |
| 17 | 21236821 | 13 | 06/03/2014 08:26 | 06/03/2014 08:45 | 1 | Tap | 0 | 18 | 38 | 5 | 0.27 |
| 18 | 21236821 | 14 | 06/03/2014 08:45 | 06/03/2014 09:58 | 0 | Unknown | 1 | 12 | 57 | 2 | 0.03 |
| 19 | 21236821 | 15 | 06/03/2014 09:58 | 06/03/2014 10:00 | 2 | Toilet | 0 | 2 | 26 | 6.5 | 2.66 |
| 20 | 21236821 | 16 | 06/03/2014 10:00 | 06/03/2014 10:30 | 0 | Unknown | 0 | 29 | 56 | 0.5 | 0.02 |
| 21 | 21236821 | 17 | 06/03/2014 10:30 | 06/03/2014 11:59 | 5 | Washing M | 1 | 28 | 59 | 19 | 0.21 |
| 22 | 21236821 | 18 | 06/03/2014 10:53 | 06/03/2014 10:54 | 2 | Toilet | 0 | 1 | 0 | 5.5 | 5.47 |
| 23 | 21236821 | 19 | 06/03/2014 10:54 | 06/03/2014 11:04 | 0 | Unknown | 0 | 9 | 23 | 1.5 | 0.16 |
| 24 | 21236821 | 20 | 06/03/2014 11:59 | 06/03/2014 12:02 | 5 | Washing M | 0 | 2 | 14 | 14 | 6.26 |
| 25 | 21236821 | 21 | 06/03/2014 12:02 | 06/03/2014 12:26 | 5 | Washing M | 0 | 23 | 56 | 32.5 | 1.36 |

## **Property 1** - overall increase of 24 litres per day

**Showers:** 45 litres increase to 52 litres
Duration from 6 minutes to 8 minutes

**External use:** twice after intervention 60 litres

**Bath:** 1No 120 litre event after intervention

# **Property 2** - overall consumption decrease of 46 l /day

**Showers:** volume of 61 litres down to 51 litres

**Toilet 1:** 8.3 litres/flush down to 6.5 litres

**Toilet 2:** 10.5 litres/flush down to 9.5 litres

## **Property 3** - overall remained unchanged

**Showers:** volume per event reduced from 54 litres down to 47 litres, but frequency per day went up from 2.1 to 2.6 times.

- Large datasets and different stats techniques
- Opportunistic use of routinely captured data
- Micro-component analysis reveals something about how use can change

Insight

# Thank you.

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