# Relation Data Model

## Raw River Flow

| date | time | cumecs | river | Gen_Code |
|---|---|---|---|---|
| <date> | <chr> | <dbl> | <chr> | <chr> |
| 2015-01-01 | 00:00:00 | 145.56822 | rakaia | highbank |
| 2015-02-01 | 00:00:00 | 114.97612 | rakaia | highbank |

## Hydro Station Generation MD

| Site_Code | POC_Code | Nwk_Code | Gen_Code | Fuel_Code | Tech_Code | Trading_date | TP1 | TP2 |
|---|---|---|---|---|---|---|---|---|
| <chr> | <chr> | <chr> | <chr> | <chr> | <chr> | <date> | <dbl> | <dbl> |
| ARA | ARA2201 | MRPL | aratiatia | Hydro | Hydro | 2020-12-01 | 12360 | 138 |

## Quarterly Retail Electricity costs

| Place | 2015-02-15 | 2015-05-15 | 2015-08-15 |
|---|---|---|---|
| <chr> | <dbl> | <dbl> | <dbl> |
| New Zealand | 28.18677 | 28.23048 | 28.31919 |

- Year and month extracted

- Year and month extracted
- Trading points averaged by month

Trading points averaged by quarter

- Convert to long format
- Reformat dates by quarter

| date | time | cumecs | river | Gen_Code | year_month |
|---|---|---|---|---|---|
| <date> | <chr> | <dbl> | <chr> | <chr> | <chr> |
| 2015-01-01 | 00:00:00 | 145.56822 | rakaia | highbank | 2015-01 |
| 2015-02-01 | 00:00:00 | 114.97612 | rakaia | highbank | 2015-02 |
| 2015-03-01 | 00:00:00 | 98.51507 | rakaia | highbank | 2015-03 |

| Gen_Code | year_month | TP1_mean | TP2_mean |
|---|---|---|---|
| <chr> | <chr> | <dbl> | <dbl> |
| aniwhenua | 2015-01 | 3593.813 | 3578.511 |
| aniwhenua | 2015-02 | 3366.934 | 3375.684 |

| quarter | Average_quarterly_gen |
|---|---|
| <dbl> | <dbl> |
| 2015.1 | 33733.54 |
| 2015.2 | 38372.67 |

| Westport | Winton | quarter | average_cost |
|---|---|---|---|
| <dbl> | <dbl> | <dbl> | <dbl> |
| 36.34455 | 29.17111 | 2015.1 | 28.89363 |
| 36.35278 | 29.64563 | 2015.2 | 28.97437 |
| 36.20371 | 29.64336 | 2015.3 | 28.05870 |

Key = Gen_Code, year_month

Key = quarter

| Gen_Code | year_month | average | date | time | cumecs | river | TP1_mean |
|---|---|---|---|---|---|---|---|
| <chr> | <chr> | <dbl> | <date> | <chr> | <dbl> | <chr> | <dbl> |
| clyde | 2015-01 | 122705.59 | 2015-01-01 | 00:00:00 | 491.5415 | clutha | 81821.29 |
| clyde | 2015-02 | 132960.58 | 2015-02-01 | 00:00:00 | 519.5486 | clutha | 94902.50 |

| quarter | Average_quarterly_gen | Ashburton | Balclutha |
|---|---|---|---|
| <dbl> | <dbl> | <dbl> | <dbl> |
| 2015.1 | 33733.54 | 26.49519 | 38.88087 |
| 2015.2 | 38372.67 | 26.47694 | 38.92987 |

### Monthly River Flow by Hydro Station Generation Output

### Quarterly Retail Electricity Costs by Hydro Station Generation Output