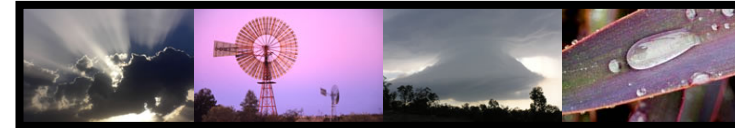


Water, Energy & Climate Change

– Queensland Perspectives



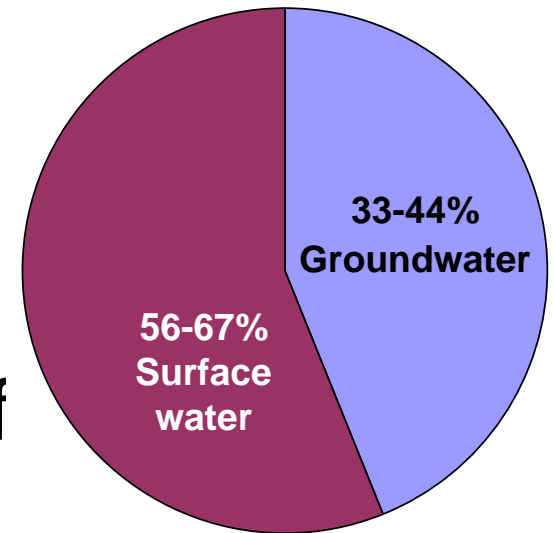
Greg Claydon
Executive Director
Strategic Water Initiatives
Department of Natural Resources & Water

Mid-range climate change scenario for QLD:

- An increase in daily average temperature by 2030 ~ 0.9 °C in coastal areas & 1.1 °C inland;
- Less rainfall & runoff, with regional exceptions;
- More severe droughts;
- Increase in extreme daily rainfall;
- Rise in sea-level ;
- More intense tropical cyclones; &
- Increased risk of storm surge.

Water Use

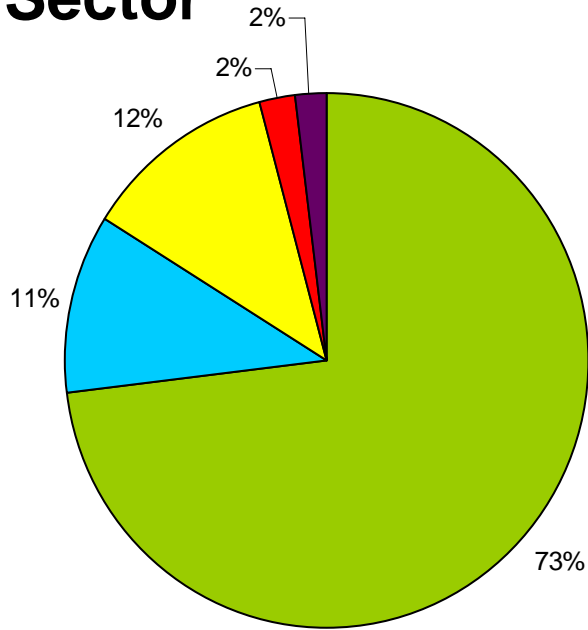
- Annual Water Consumption
 - Australia 19,000-25,000 GL
 - QLD 3,500-4,600 GL
- Annual Surface Water Runoff
 - Australia 240,000-400,000 GL
 - QLD 93,000-160,000 GL



Use from water sources in Qld

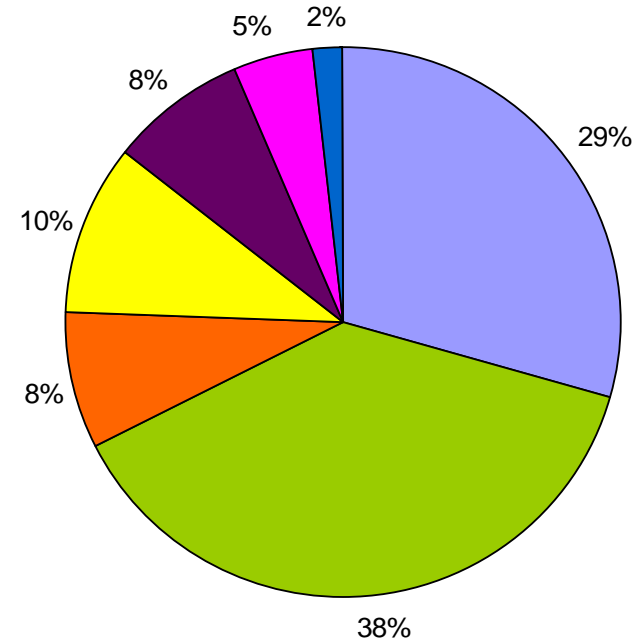
QLD Water Use

by Sector



■ Agriculture: 3200GL	■ Industry/Manuf: 480 GL
■ Urban Residential: 520GL	■ Mining: 90GL
■ Energy: 90GL	

Rural Use

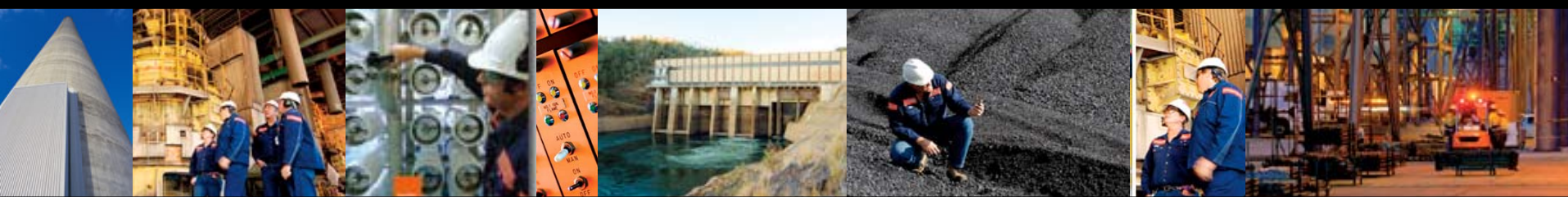


■ Cotton 857GL	■ Sugar 1,116GL
■ Horticulture 227GL	■ Livestock 294GL
■ Pastures (incl. Dairy) 240GL	■ Grains 136GL
■ Other 47GL	

Source: AWR2005

Water Use by Generating Systems

- Wet cooled coal fired: 2,000 - 2,500 L/Mwh
- Dry cooled coal fired: 100 – 250 L/Mwh
- Combined cycle gas turbine: 800 – 1,000 L/Mwh
- Open cycle gas turbine: Negligible

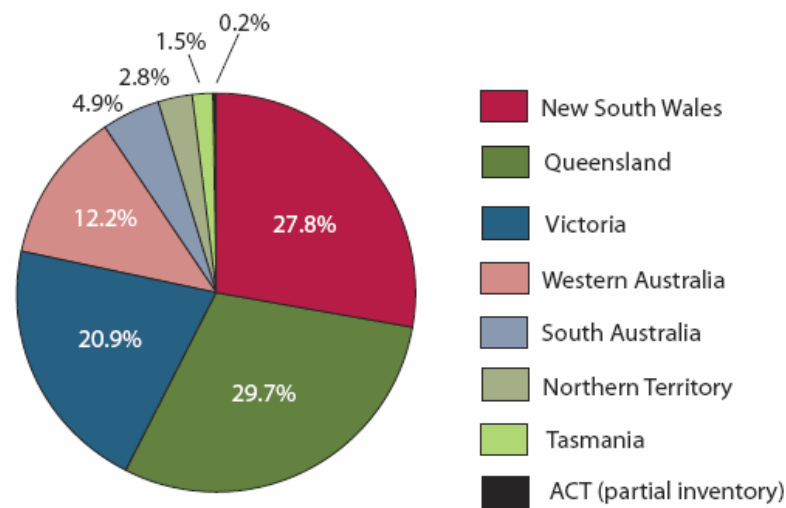


Source: Tarong Energy

Energy Use (2006)

- Australia
 - Energy use 5,600PJ
 - CO² emissions 580 Mt
- Queensland
 - Energy use 1,300PJ (23 %)
 - CO² emissions 170 Mt

Figure 1: State and Territory Shares of National Emissions, 2006



Energy for Water Supply in QLD

	Annual Water Use (ML)	Average Estimated Energy Use (KWh/ML)	Energy Use (MWh)	Energy Use (PJ)
Agriculture	3,200,000	255	716,400	2.6
Urban (incl. domestic, industrial & manufact)	520,000	1000	1,003,000	3.6
Mining & Energy	180,000	560	97,000	0.4
Total Energy	-	-	1,720,000	6.6

% of Total Qld Energy Use =

$$\frac{6.6 \text{ PJ}}{1297 \text{ PJ}} = 0.5\%$$

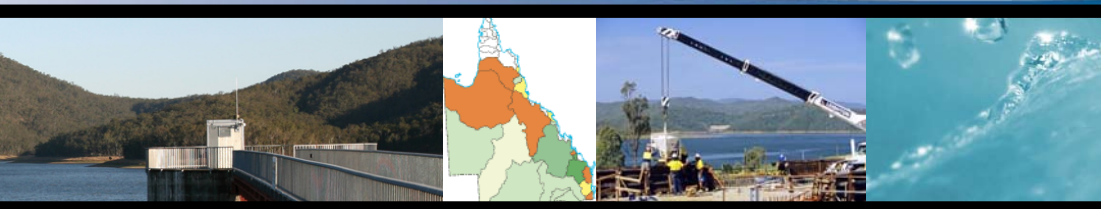
Making the WECC Connection

- Policy Initiatives
 - Climate Change Impact Statements
 - ClimateSmart 2050: Queensland Climate Change Strategy 2007
 - Investing in water / energy / climate R&D (QCCCE, SEQ Urban Water Security Research Alliance, CRCs)
 - Setting Sustainable Housing parameters
 - Industry water & energy reporting requirements
 - State-wide demand management programs



Making the WECC Connection

- Water Resource Planning
 - Climate change to be considered in 2nd generation WRPs
 - Modelling underpins WRPs & provides for local assessment of the impacts of climate change scenarios
- Water Supply Planning
 - Water balance includes future energy developments
 - Regional water supply planning considers energy requirements in demand/supply options
 - Levels of service for climate variability & change scenarios

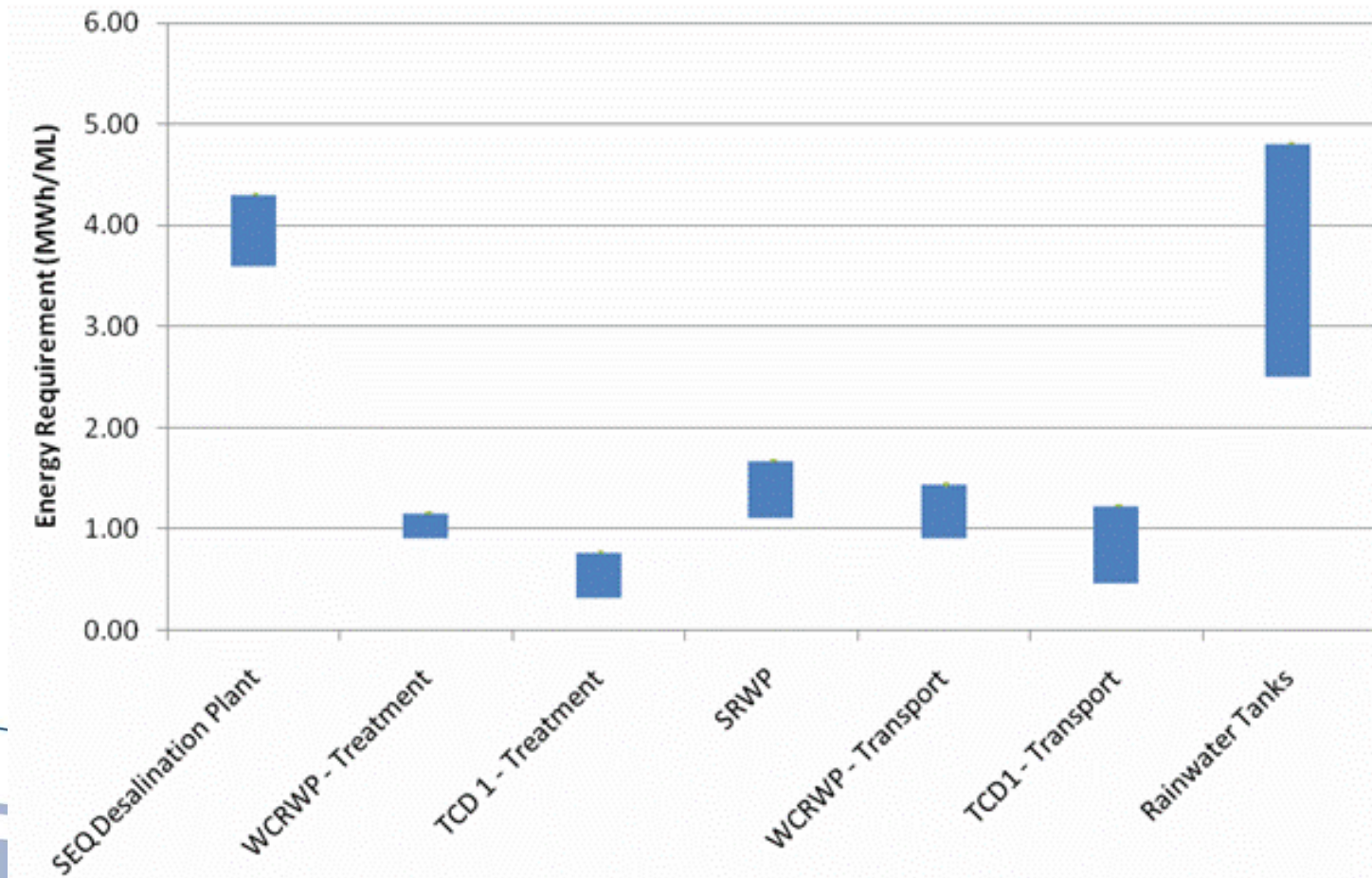


Making the WECC Connection

- SEQ Water Strategy
 - Recognises energy needs to deliver water
 - Ironically, more climate independent water supply requires use of more energy intensive options
 - Recycled water is main source for power stations
 - By 2012 ~1.18 megawatt hours of energy used to supply a megalitre into the Water Grid
 - Represents 3% of total average household energy consumption based on average water consumption per household of 210KL

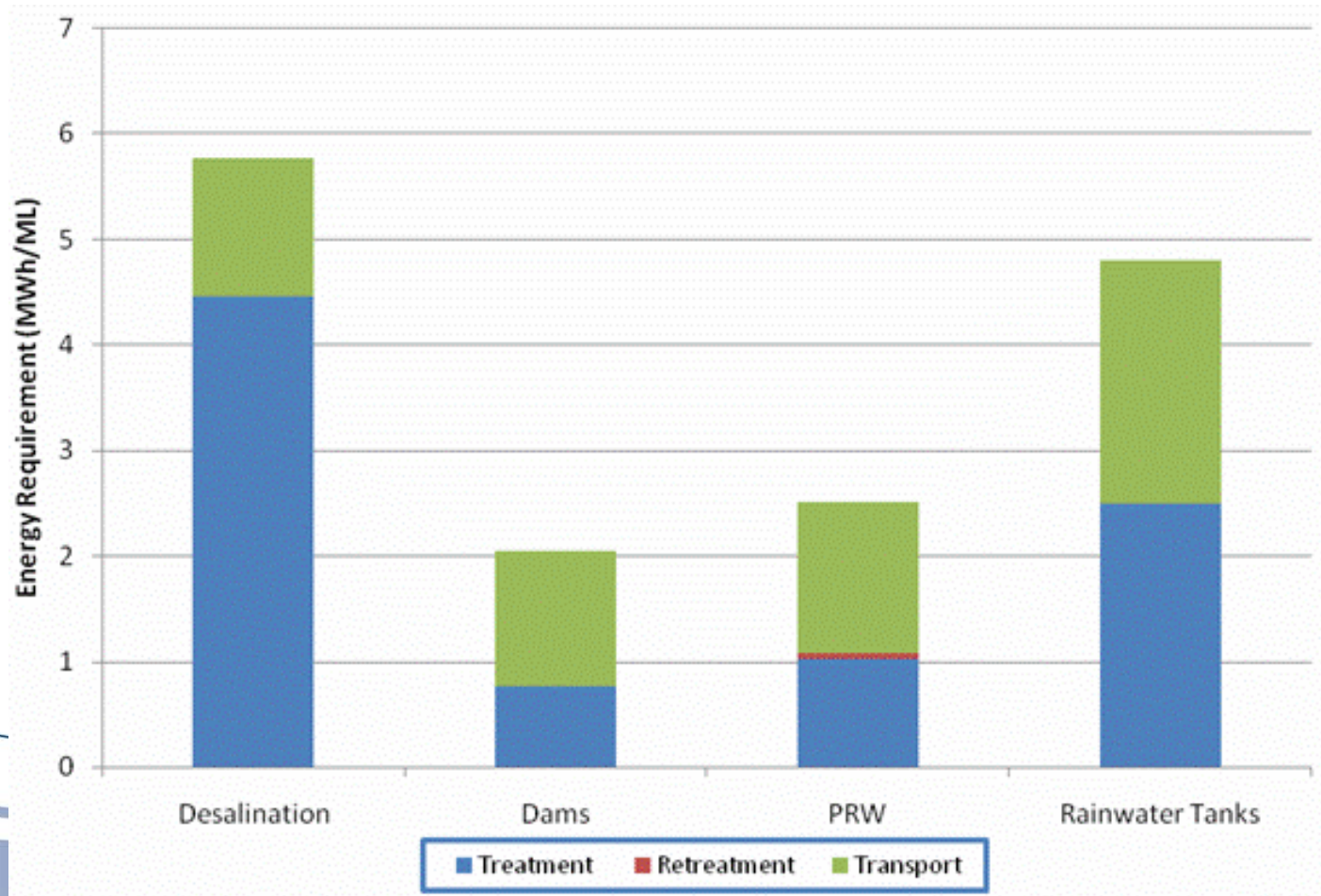


Energy Intensity of SEQ Components

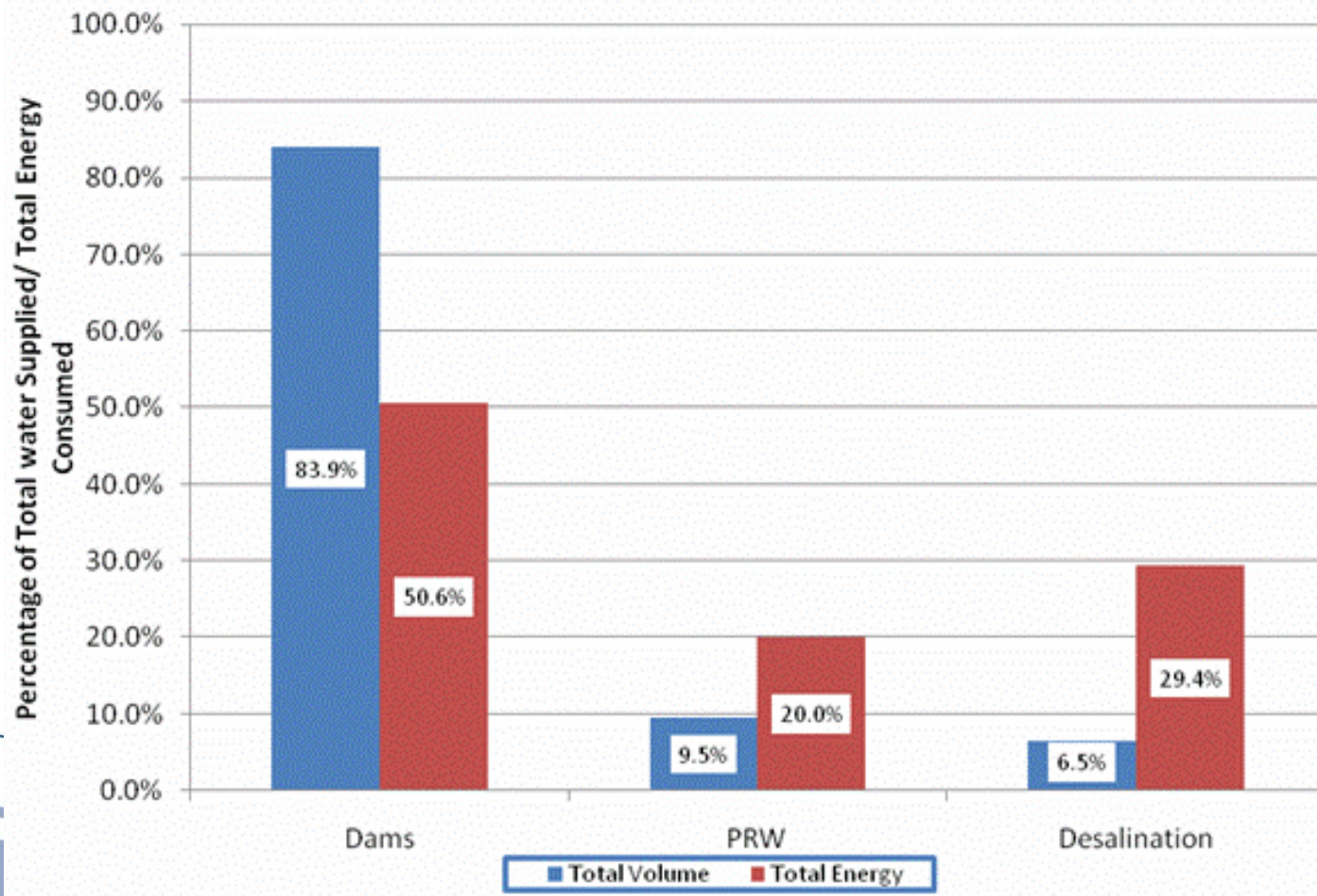


WCRWP - Western Corridor Recycled Water Project
TCD - Traveston Crossing Dam
SRWP - Southern Regional Water Pipeline

SEQ Water Supply Energy Requirements



SEQ Water Grid: Projected energy & water supply in 2012



Draft WECC Principles

- Water, energy & climate policy and planning should be integrated.
- Water resource planning should consider climate change scenarios in assessing water availability and performance for the environment and for water users.
- Water supply planning options should consider climate variability & climate change scenarios to achieve agreed levels of service
- Energy planning options should consider impacts on the regional water balance.

Draft WECC Principles cont...

- Pursue energy / water optimisation:
 - Energy supply options should consider water demands and associated climate change implications
 - Water supply options should consider energy demands and associated climate change implications.
- Minimise GHG emissions by maximising:
 - efficiency of water & energy use
 - use of low emission or renewable alternatives.
- In GHG policy recognise:
 - the water entitlement issues
 - the environmental flow impacts.

THANK YOU

