



Water Footprint Management



January 2008





Water Footprint

- Water was once an overhead cost - now it's a source of brand and operational risk
 - Availability for operations
 - Quality (into and out of the enterprise)
 - Quantity (consumed)
 - Impact on water availability for other uses, land health and wildlife

- Significant link between water management and carbon management
 - Pumping consumes power, which generates greenhouse gases
 - 15% of California's power, 2-3% of the entire UK's power
 - Power generation requires huge volumes of water for cooling



Water footprint can be thought of as concentric circles of activity

Within the enterprise

- Building, plant and process usage

Within the extended enterprise

- Supply chain, suppliers

Within the environment

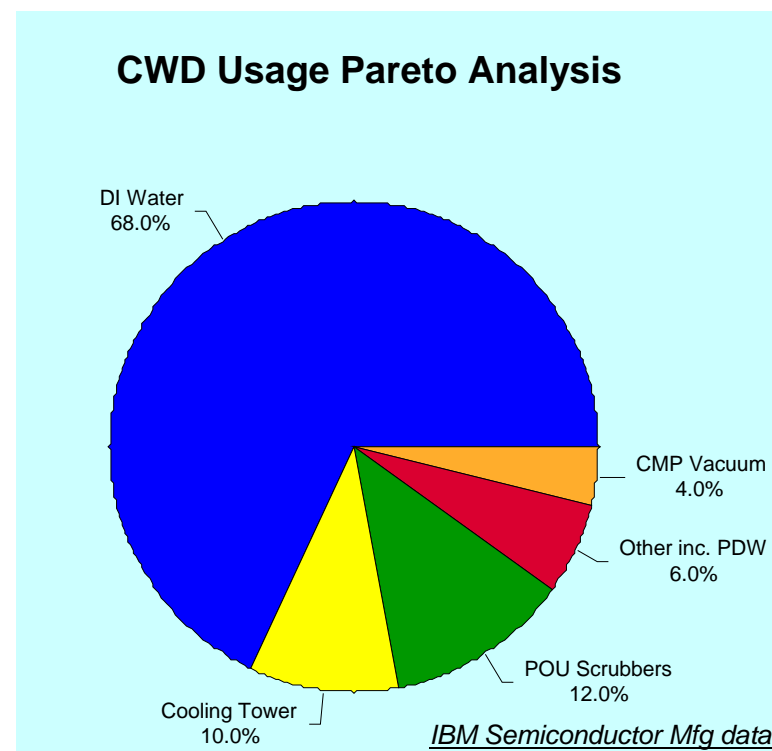
- Offsetting strategies that improve water usage or quality in the community





Within the enterprise (not rocket science) (1/2)

- Many companies know total water usage, but cannot explain it - they cannot monitor it by process, line, or sometimes even by plant. Therefore they cannot manage it.
- **Monitoring and measuring** - create a baseline to manage from:
 - Quantity - meters, site by site, line by line, machine by machine
 - Quality, in and out of the enterprise (waste water disposal)
 - Water “dashboard” - asset mgmt s/w or custom-made
 - Pareto focus - go for the big items



DI = Deionized water; POU = Point of use Scrubber (for air pollution reduction), PDW = Potable Domestic Water, CMP = Chemical Mechanical Polish (key manufacturing step)



Within the enterprise (not rocket science) (2/2)

■ **Process focus**

- Lean six sigma-type focus - rearrange activity, look at alternatives
 - Ways to reduce consumption & contamination or use grey water...?
 - Why not optimize carbon emissions at the same time...?
 - This may identify other process improvements - lean and green coincide where waste or unnecessary activity is reduced
- Consider energy purchased with raw water:
 - Eliminate pump & dump - use incoming pressure to max potential
 - Heat and/or cooling potential
- Innovate!

■ **Cultural change** required to achieve water awareness

- Accountability, targets, best practice sharing, corporate standards for water use, etc



Within the extended enterprise - supply chain

- **“If it’s your supply chain, it’s your issue”** - morally, and in PR terms

- **Strategic sourcing:** effective water management as a sourcing criterion
 - Consumption and/or contamination of local water resources
 - Reliability of water supply = reliability of your supply!
 - Impact on your brand/reputation
 - Possibly, impact on quality of goods (eg food)
 - Comparison between suppliers on water management practices
 - Working with suppliers to help them improve
 - Locating manufacturing or agricultural activity in low water-stress areas
 - Possible tradeoff with additional transportation distances (carbon)

- **Irrigation** (food/agriculture): use of effective irrigation practices
 - Drip irrigation, link to effective weather forecasts for irrigation decisions



Within the environment

- Zero water footprint is probably not an option - but “offsetting” may be
- **River basin, watershed or aquifer management** (water banking)
 - Sensor-based management networks - using “smart grid” technologies
 - Sensing for quantity, multiple aspects of water quality, soil moisture, etc
 - Integrated with weather forecasting
 - Data aggregation and visualization to enable management decisions
- **Education** on land management and water management practices
 - Encouraging water conservation - domestics, industrial, agriculture and forestry practices
 - Distance learning for remote farmers
 - Urbanization decisions