

QUF formulae used in calculating annual QUFs

The input data is derived from the same data used by NEMMCO to generate MLFs for the relevant financial year. The standard formula for calculating annual QUFs for each transmission zone is:

$$QUF_1 = \frac{Local_1 + (X_{1-2} * QUF_2) + (X_{1-3} * QUF_3) + \dots + (X_{1-n} * QUF_n)}{Generation_1 + M_{2-1} + M_{3-1} + \dots + M_{n-1}}$$

where

QUF_k	=	Queensland Usage Factor for Zone k
$Generation_k$	=	local generation in Zone k
M_{i-k}	=	imports from Zone i into Zone k
X_{k-i}	=	exports from Zone k to Zone i
QUF_i	=	Queensland Usage Factor for Zone i
$Local_k$	=	local Queensland load (electricity use) in the zone

Note: losses are accounted for in the flow between Zones.

QUF formulae used in calculating the 2009-10 annual QUFs

$$QUF_{FN} = \frac{Local_{FN} + (X_{FN-ROSS} * QUF_{ROSS})}{(Generation_{FN} + M_{ROSS-FN})}$$

$$QUF_{ROSS} = \frac{Local_{ROSS} + X_{ROSS-FN} + (X_{ROSS-NQ} * QUF_{NQ})}{(Generation_{ROSS} + M_{FN-ROSS} + M_{NQ-ROSS})}$$

$$QUF_{NQ} = \frac{Local_{NQ} + X_{NQ-ROSS} + (X_{NQ-CW} * QUF_{CW})}{(Generation_{NQ} + M_{CW-NQ} + M_{ROSS-NQ})}$$

$$QUF_{CW} = \frac{Local_{CW} + X_{CW-NQ} + (X_{CW-GLAD} * QUF_{GLAD}) + (X_{CW-SW} * QUF_{SW})}{(Generation_{CW} + M_{NQ-CW} + M_{GLAD-CW} + M_{SW-CW})}$$

$$QUF_{GLAD} = \frac{(Local_{GLAD} + (X_{GLAD-CW} * QUF_{CW}) + (X_{GLAD-WB} * QUF_{WB}))}{(Generation_{GLAD} + M_{CW-GLAD} + M_{WB-GLAD})}$$

$$QUF_{WB} = \frac{(Local_{WB} + X_{WB-GLAD} + (X_{WB-MTN} * QUF_{MTN}))}{(Generation_{WB} + M_{MTN-WB} + M_{GLAD-WB})}$$

$$QUF_{SW} = \frac{(Local_{SW} + X_{SW-CW} + (X_{SW-MTN} * QUF_{MTN}) + (X_{SW-BULLI} * QUF_{BULLI}))}{(Generation_{SW} + M_{CW-SW} + M_{MTN-SW} + M_{BULLI-SW})}$$

$$QUF_{BULLI} = \frac{Local_{BULLI} + X_{BULLI-SW}}{(Generation_{BULLI} + M_{SW-BULLI} + M_{NNSW-BULLI})}$$

$$QUF_{MTN} = \frac{Local_{MTN} + X_{MTN-WB} + (X_{MTN-SW} * QUF_{SW}) + (X_{MTN-GCT} * QUF_{GCT})}{(Generation_{MTN} + M_{WB-MTN} + M_{SW-MTN} + M_{GCT-MTN})}$$

$$QUF_{GCT} = \frac{Local_{GCT} + (X_{GCT-MTN} * QUF_{MTN})}{(Generation_{GCT} + M_{MTN-GCT} + M_{NNSW-GCT})}$$

$$QUF_{NNSW} = \frac{X_{NNSW-GCT} + X_{NNSW-BULLI}}{(Generation_{NNSW} + M_{GCT-NNSW} + M_{BULLI-NNSW} + M_{RNEM-NNSW})}$$

$$QUF_{RNEM} = \frac{X_{RNEM-NNSW} * QUF_{NNSW}}{(Generation_{RNEM} + M_{NNSW-RNEM})}$$

QUF formulae used in calculating the 2004-05 through 2008-09 annual QUFs

$$\begin{aligned}
 \text{QUF}_{\text{FN}} &= \frac{\text{Local}_{\text{FN}} + (\text{X}_{\text{FN-ROSS}} * \text{QUF}_{\text{ROSS}})}{\text{Generation}_{\text{FN}} + \text{M}_{\text{ROSS-FN}}} \\
 \text{QUF}_{\text{ROSS}} &= \frac{\text{Local}_{\text{ROSS}} + \text{X}_{\text{ROSS-FN}} + (\text{X}_{\text{ROSS-NQ}} * \text{QUF}_{\text{NQ}})}{\text{Generation}_{\text{ROSS}} + \text{M}_{\text{FN-ROSS}} + \text{M}_{\text{NQ-ROSS}}} \\
 \text{QUF}_{\text{NQ}} &= \frac{\text{Local}_{\text{NQ}} + \text{X}_{\text{NQ-ROSS}} + (\text{X}_{\text{NQ-CW}} * \text{QUF}_{\text{CW}})}{\text{Generation}_{\text{NQ}} + \text{M}_{\text{CW-NQ}} + \text{M}_{\text{ROSS-NQ}}} \\
 \text{QUF}_{\text{CW}} &= \frac{\text{Local}_{\text{CW}} + \text{X}_{\text{CW-NQ}} + (\text{X}_{\text{CW-GLAD}} * \text{QUF}_{\text{GLAD}}) + (\text{X}_{\text{CW-SW}} * \text{QUF}_{\text{SW}})}{\text{Generation}_{\text{CW}} + \text{M}_{\text{NQ-CW}} + \text{M}_{\text{GLAD-CW}} + \text{M}_{\text{SW-CW}}} \\
 \text{QUF}_{\text{GLAD}} &= \frac{\text{Local}_{\text{GLAD}} + (\text{X}_{\text{GLAD-CW}} * \text{QUF}_{\text{CW}}) + (\text{X}_{\text{GLAD-WB}} * \text{QUF}_{\text{WB}})}{\text{Generation}_{\text{GLAD}} + \text{M}_{\text{CW-GLAD}} + \text{M}_{\text{WB-GLAD}}} \\
 \text{QUF}_{\text{WB}} &= \frac{\text{Local}_{\text{WB}} + \text{X}_{\text{WB-GLAD}} + (\text{X}_{\text{WB-MN}} * \text{QUF}_{\text{MN}})}{\text{Generation}_{\text{WB}} + \text{M}_{\text{MN-WB}} + \text{M}_{\text{GLAD-WB}}} \\
 \text{QUF}_{\text{SW}} &= \frac{\text{Local}_{\text{SW}} + \text{X}_{\text{SW-CW}} + (\text{X}_{\text{SW-MN}} * \text{QUF}_{\text{MN}}) + (\text{X}_{\text{SW-MS}} * \text{QUF}_{\text{MS}})}{\text{Generation}_{\text{SW}} + \text{M}_{\text{CW-SW}} + \text{M}_{\text{MN-SW}} + \text{M}_{\text{MS-SW}} + \text{M}_{\text{NNSW-SW}}} \\
 \text{QUF}_{\text{MN}} &= \frac{\text{Local}_{\text{MN}} + \text{X}_{\text{MN-WB}} + (\text{X}_{\text{MN-SW}} * \text{QUF}_{\text{SW}}) + (\text{X}_{\text{MN-MS}} * \text{QUF}_{\text{MS}})}{\text{Generation}_{\text{MN}} + \text{M}_{\text{WB-MN}} + \text{M}_{\text{SW-MN}} + \text{M}_{\text{MS-NM}}} \\
 \text{QUF}_{\text{MS}} &= \frac{\text{Local}_{\text{MS}} + \text{X}_{\text{MS-MN}} + (\text{X}_{\text{MS-SW}} * \text{QUF}_{\text{SW}}) + (\text{X}_{\text{MS-GCT}} * \text{QUF}_{\text{GCT}})}{\text{Generation}_{\text{MS}} + \text{M}_{\text{MN-MS}} + \text{M}_{\text{SW-MS}} + \text{M}_{\text{GCT-MS}}} \\
 \text{QUF}_{\text{GCT}} &= \frac{\text{Local}_{\text{GCT}} + (\text{X}_{\text{GCT-MS}} * \text{QUF}_{\text{MS}})}{\text{Generation}_{\text{GCT}} + \text{M}_{\text{MS-GCT}} + \text{M}_{\text{NNSW-GCT}}} \\
 \text{QUF}_{\text{NNSW}} &= \frac{\text{X}_{\text{NNSW-GCT}} + \text{X}_{\text{NNSW-SW}}}{\text{Generation}_{\text{NNSW}} + \text{M}_{\text{GCT-NNSW}} + \text{M}_{\text{SW-NNSW}} + \text{M}_{\text{RNEM-NNSW}}} \\
 \text{QUF}_{\text{RNEM}} &= \frac{(\text{X}_{\text{RNEM-NNSW}} * \text{QUF}_{\text{NNSW}})}{\text{Generation}_{\text{RNEM}} + \text{M}_{\text{NNSW-RNEM}}}
 \end{aligned}$$

Assumptions

The following key assumptions underpin the formulae.

1. A QUF of greater than zero and less than one is applied to export flows which are considered to be potentially used to satisfy electricity demand in both Queensland and another state.
2. A QUF of one is applied to export flows that are considered to be entirely used to satisfy Queensland demand (for example, any export flows from NSW across the inter-connectors into Queensland, or export flows into a zone in Queensland that is further removed from a connection to NSW than the originating zone).
3. A QUF of zero is applied to export flows that are considered to be entirely used to satisfy demand in a state other than Queensland (for example, the export flows from Queensland across the inter-connectors into NSW).
4. There are no constraints in the system. Constraints are specific to one point in time and the calculations of QUFs for the Scheme are applied on an annual basis.
5. The export flows from a zone will not be used to satisfy demand within the originating zone.
6. Net electricity flows are not used. Total annual exports and imports of electricity flows into each zone are accounted for separately.

The export flows with a QUF of zero or one are noted on the relevant diagram of the transmission zones and interconnections that can be found on this website.