Alternative Technology Association Submission to BRWG:

~ Net Import / Export Calculation Capability ~

1. Overview

The Alternative Technology Association (ATA) has identified a need for all twin element meters to be able to calculate net export and net import both of active power (kW) and active energy (kWh) values.

Of the metering configurations specified in NSMP SMI Functional Specification version 0.21, this capability is required for the following:

- Single Phase / Two Element meters with Controlled Load Contactor (second element measures controlled load); and
- Single Phase / Two Element meters for on-site generation (second element measures on-site energy generation).

Net import / export calculation capability:

- supports a number of the Ministerial Council on Energy's Policy Objectives for the NMSP;
- is required to deliver some functions as described in the Smart Meter Infrastructure Minimum Functional Specification; and
- is needed to measure import (net energy flow from the customer to the network) for the purposes of determining net feed-in tariffs which are currently available in most jurisdictions.

2. MCE Objectives supported by Functions requiring Net Import / Export Capability for Twin Element Meters

MCE Objective	Supported
Reducing demand for peak power, with consequential infrastructure savings (e.g. network augmentation and generation).	Yes
Promoting the long term interests of electricity consumers with regard to the price, quality, security and reliability of electricity.	Yes
Enabling consumers (including residential, business, low and high-volume users) to make informed choices and better manage their energy use and greenhouse gas emissions.	Yes
Manage distributional price impacts for vulnerable consumers.	Yes
Promoting energy efficiency and greenhouse benefits.	Yes
Providing a potential platform for other demand side response measures and avoiding discrimination against technologies, including alternative energy technologies.	Yes

3. SMI Functions which require Net Import / Export Calculation Capability for Twin Element Meters

Function	Requirement
Measurement and recording (Function 1) "The meter shall calculate total net active energy and total net reactive energy as the summation of the net flows on all measurement elements."	*Net import / export calculation capability is required to allow twin element meters to calculate "total net active energy and total net reactive energy as the summation of the net flows on all measurement elements".*
Visual display on meter **(Function 4)** "The meter will also display Active Power, clearly indicating if it is imported or exported"	*Net import / export calculation capability is required to allow twin element meters to display imported and exported active power.* Noting the discussion which has recurred regarding this feature (display of active import / export power), ATA strongly support its inclusion in the minimum functional specification as it is key to delivering some MCE objectives for smart metering while providing benefits to customers, retailers and distribution businesses: ▪ The ability to view active power consumption will assist many customers to better understand and manage their energy consumption. ▪ With the introduction of ToU tariffs it is important, but would be difficult, for customers to understand the implications of their energy consumption at given times without this feature. ▪ In some cases it is likely to provide a means of avoiding or resolving billing disputes, particularly where on-site generation is installed. ▪ In the case of supply capacity limiting, it is fair that customers are able to view the kW values on which their supply is being limited. ▪ HAN devices with the ability to display power import and export may not be affordable (or available) for many customers, including those on low income and renters. Further, until HAN products are introduced into the market, it is uncertain what the cost of HAN devices will be.

Four Quadrant Metering (Functions 10/11)	**BRWG Action 20090810.17**: There is a desire to provide a two element solution capable of satisfying either net or gross tariff metering via optional programmable parameters. *Net import / export calculation capability is required for any twin element meters to calculate net feed in tariffs.*
Supply Capacity Control (Function 13) "When the Emergency Supply Capacity limit is enabled supply shall be uninterrupted if the *Total Exported Active Energy* is below L kWh measured over a period of M minutes."	*Net import / export calculation capability is required for twin element meters to measure total export active energy for any non trading-interval based period. This is the case for the Emergency Supply Capacity limit which is based on one minute intervals.* Without net import / export calculation capability, customers with twin element meters for onsite generation would be unfairly penalised when *Total Exported Active Energy* is below the limit while their gross consumption is above the limit.

4. Recommendation

The BRWG paper *"Function 11: Import / Export Metering"* (Dr Martin Gill, 30th Sept 09) makes the following recommendation:

> *"To support jurisdictional requirements for both Net and Gross metering whilst providing customers access to their on-site generation, it is recommended that two element meters support a virtual 3rd measurement element. The energy data from this element can be configured for recording in trading intervals and for remote collection. All of the information should be available for display on the HAN."*

ATA support the above recommendation, with the following amendments:

1. **That the term *'net import / export calculation capability'* be used in place of *'virtual element'* or *'third element'*.**

   The terms 'virtual element' and 'third element', though convenient, should be avoided as:

   - they suggest more significant variation to the meter specification than is actually required to achieve the desired outcomes;
   - the actual cost of implementing this feature is insignificant when compared with the cost of adding an additional physical measurement element. Smart meter provider GE has confirmed that this capability is standard of most of their meters; and
   - they are not standard terms or self-explanatory.

2. **Add a statement to the effect that the active net import / export power (i.e. W or kW) data calculated will be also available to the visual display on the meter and to the HAN.**

3. **Acknowledge that the capability is required for all twin element meters, not only those used for distributed (on-site) generation, to enable measurement of net (or total) import and export for the Supply Capacity Control purposes.**