



# Monitoring & Metering : Satisfying CHPQA Metering Requirements

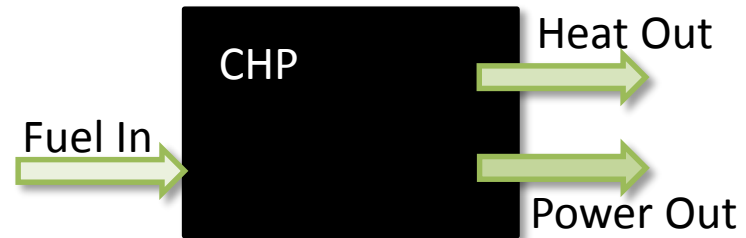
Pete Edwards  
CHPQA



# Monitoring & Metering

## ➤ Scheme Boundaries

- black box approach



- can be flexible, as long as
  - boundaries meet the CHPQA requirements
  - appropriate monitoring systems are in place



# Monitoring & Metering

- It is required to monitor the key inputs and outputs of a scheme:
  - All fuel inputs
  - Total power generated
  - Useful heat
  - Power imports/exports (optional)
  
- Required to satisfy metering quality requirements
  
- Metering requirements are detailed in
  - Fuel Inputs – GN14
  - Power Outputs – GN15
  - Heat Outputs – GN16



# Fuel Input

## Gases

- Natural gas, biogas, syngas

- Billing meters, correction, CV



## Liquids

- Hydrocarbon oils, bioliquids

- Flow meters, purchase & stock control, CV

## Solids

- Homogeneous
  - Coals, some biomass
- Heterogeneous
  - Wastes, biomass



- Gravimetric, purchase & stock control
- CV, Moisture analysis
- Sampling protocol





# Power Output

- Generator – power measured at terminals
  - Appropriate Class meter – GN15
    - or demonstrate meets specification



- Export/Import – optional
  - Meter Class appropriate



- Mechanical Power
  - equivalent electrical output x 1.05



# Heat Output

## ➤ Location

- Monitoring must be located such that the 'useful heat' is monitored
  - eg heat rejection and internal use (eg deaeration, pre-heating) must be accounted for

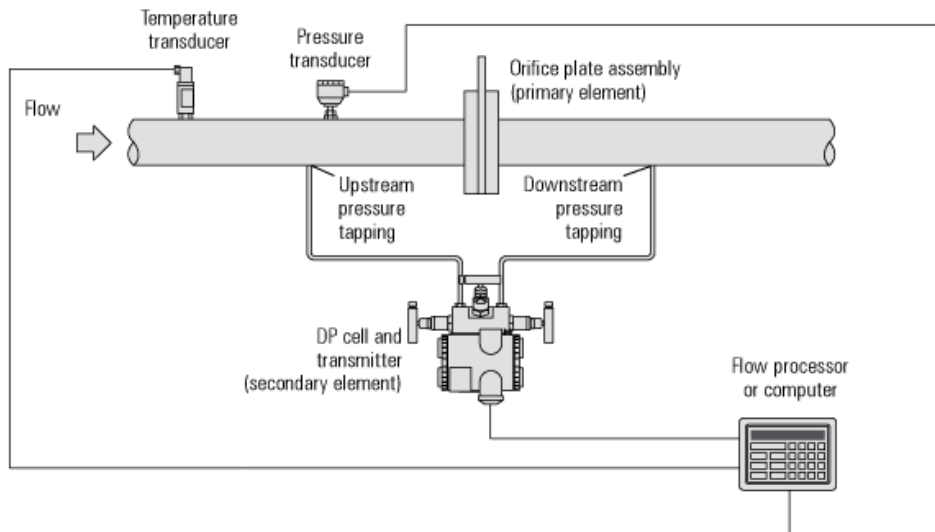
- Water/Thermal Oil

- Packaged device – EN1434
- Component device
  - flowmeter
  - temperatures
  - calculator

- Steam

- Consists of

- primary device (pipeline unit)
- secondary device (signal unit)
- flow processor or computer





# Metering Quality

## ➤ Why?

- To maintain a robust monitoring system
- To ensure benefits are properly and fairly targeted

## ➤ Guidance

- Meters (GN17) – includes a ‘simplified’ approach to calculating uncertainty for meters
- Calculations (GN18) – details the approach to determining and combining uncertainties for calculated inputs/outputs
- Adjustments (GN19) – shows how to adjust inputs/outputs in CHPQA submissions for excessive uncertainty

