

Interim Options Review

Sub Group 2

September 2010

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Executive Summary

This document provides an initial descriptive summary of the different options identified by the ERA as potential technical solutions to Interim Interoperability arrangements.

In addition to the summary of options there is an accompanying high level Strengths, Weaknesses, Opportunities & Threats (SWOT) analysis for each individual option. This is by no means an exhaustive list but provides a ScottishPower initial view of the various options.

The document is concluded with an high level review of the governance arrangements discussed during the SG2 initial meeting.

Introduction

The following sections describe a number of potential models for the implementation of an interim interoperability solution for smart meters. The following models have been considered:

- Central translation services
- Standardised head end services
- Universal head end
- Suppliers customise interfaces for each head end
- Suppliers provide data services
- Supplier configures meter on CoS (exchange of SIM)

Further options have been identified but not evaluated at this time. These models allow for variations in the ownership and control of head ends and in the transition to the interim solution e.g. Suppliers continue to use existing infrastructure until CoS.

The following themes are common to all the potential models

- Interim solution demands resource commitment from suppliers potentially at expense of the implementation of the industry programme;
- Enduring security and data privacy principles need to be embedded within interim design which may result in significant costs;
- Mechanisms for obtaining accurate and up to date registration data from IGTs need to be confirmed;
- Unclear if the timescales for interim solutions support the early development of a common approach to PPM;
- The Interim service is expected to have a short life but will require significant costs to establish;
- Interim solution may have to continue to run in parallel with DCC solution to support non-compliant smart meters and non-domestic customers.

Option 1 - Central Translation

Description

Suppliers perform their own rollouts of Smart Meters and WAN Communications Devices.

Suppliers procure their own Head End systems, either collectively or individually.

A separate, central system (Interim Service) provides access to:

- Smart Metered Supply Points
- Supplier registration details
- Head End providers (per Supply Point)
- Meter Ids
- Meter Capabilities

The interim service includes a lookup facility for this information, controls access to authorised parties, and directs information to the correct Head-End and Supplier.

The interim service translates standard Supplier requests into head end specific messages.

Options exist for all of the head ends which will be used by the interim service to be owned by multiple parties (e.g. Suppliers) or by the interim service.

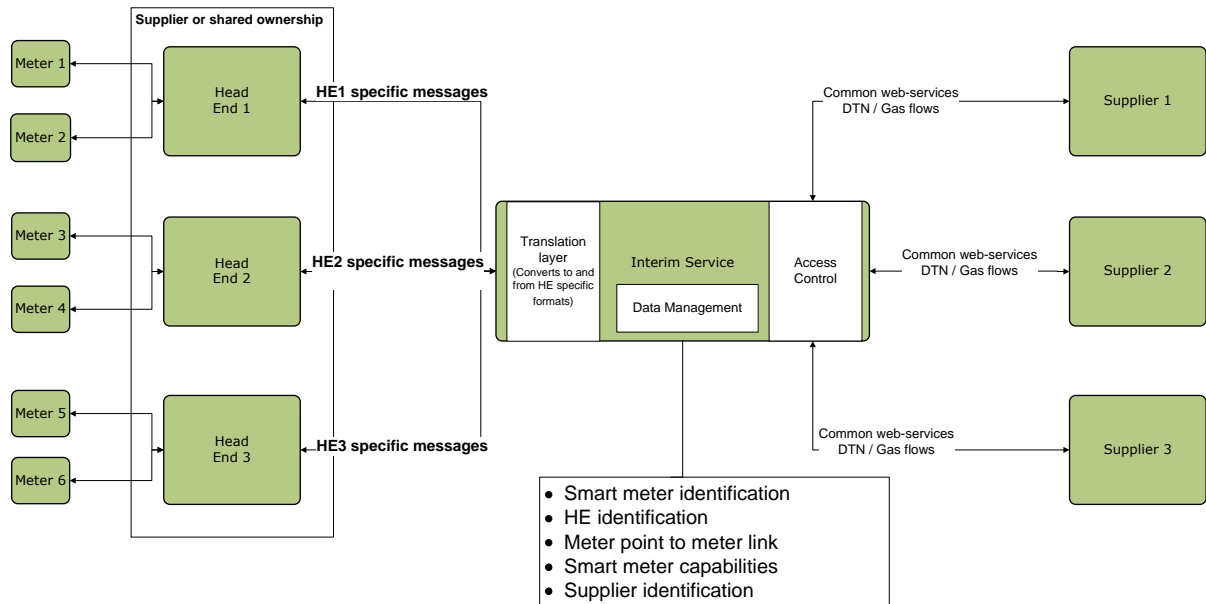


Figure 1: Central Translation

SWOT

Strengths

- Single interface for suppliers will enable communication with all smart meters – reduces Supplier development effort
- Single point of access to all smart meters, ensures only authorised parties can communicate with meters- No exchange of access details at CoS
- Allows suppliers to use existing communications infrastructure
- Allows suppliers to use existing dataflow infrastructure
- Provides option to use web-services to enable full functionality
- Uses proven head end technology and capabilities
- Converts messages into required format for meters/suppliers – no requirement for suppliers to build/procure their own translation services
- Single repository for all smart meter data provides opportunity for suppliers to be able to identify presence of smart meter prior to taking over supply point
- Will support key processes required by Suppliers
- Facilitates interoperability at CoS without changes to the meter hardware (meter, SIM card, etc);
- No dependency on other Suppliers

Weaknesses

- Use of multiple head ends and establishment of central service requires significant development effort for central service interfaces - adds to implementation complexity and cost
- Changes required to use and/or structure of existing flows and or web services need to be created to support even basic smart functionality for Suppliers – meter configuration, provision of pricing information etc. Over and above that provided by initial deployments
- Migration activity required prior to establishment of central service – in order to populate meter and comms data
- Multiple head end ownership will require complex commercial and support agreements- definition of these will potentially add to time required to implement central service
- Compliance/accreditation testing required to allow central service to use DTN/UKLink etc. potentially adds to implementation time
- Potential for extended implementation time- tender process for provision of central services, creation of central systems, look-ups to registration systems, full end-to-end testing required for all participants
- Does not allow suppliers to use existing head-end systems - Suppliers must migrate to interim service
- Comms contracts would need to be transferred from suppliers/service providers to central service - dependent on ownership

Opportunities

- Allows industry to test/hone operations using central service provider for smart meters
- Single source of data held in standard form available for transition to DCC
- Potentially allows for some premise alignment and improvement in data quality prior to creation of DCC
- Opportunity for the Interim Service to include a translation layer, to translate Head-End messages into standard DTC / UK Link data flows;
- Opportunity for the Interim Service to forward information/messages to Distribution operators or third parties in a standard format (e.g. Supply Outages, Alarms, Tamper alerts)
- Provides opportunity to establish end-to-end security standards for smart meters
- Provides opportunity to implement data privacy standards, all smart meter data and access to it obtained/held in single source
- Standardisation of registration look-up could be used by initial DCC - Existing systems (e.g. ECOES, SGOES) could be used with changes to identify smart meters
- Suppliers can choose the services they wish to support

Threats

- Could be regarded as de facto DCC and no further industry development takes place
- May provide owner of central service with competitive advantage in DCC tendering process
- Distributed ownership of head ends makes establishment of data privacy and end-to-end security standards difficult to establish
- New services/processes would need to be defined to allow suppliers to fulfil mandated interim obligations
- May need to be run in parallel with DCC if central service supports non-technically compliant smart meters and also any non-domestic meters supported by service and suppliers elect not to use DCC
- Support for prepayment unclear – Prepayment solution requires specific supplier, payment network, head end and meter functionality. The use of different head-end systems may complicate (or even prevent) the implementation of a standard industry solution;

Option 2 - Standardise Head End Services

Description

Meter manufacturers develop and provide an standard interface to head end.

Suppliers perform their own rollouts of Smart Meters and WAN Communications Devices.

Suppliers procure their own Head End systems, either collectively or individually.

A separate, central system (Interim Service) provides access to:

- Smart Metered Supply Points
- Supplier registration details
- Head End providers (per Supply Point)
- Meter Ids
- Meter Capabilities

The interim service includes a lookup facility for this information, controls access to authorised parties, and directs information to the correct Head-End and Supplier.

Communications between the interim service and the Head Ends (or the Supplier and Head End) uses standardised messages / interfaces.

Communications between each Head-End and Meter may use meter manufacturer specific messages.

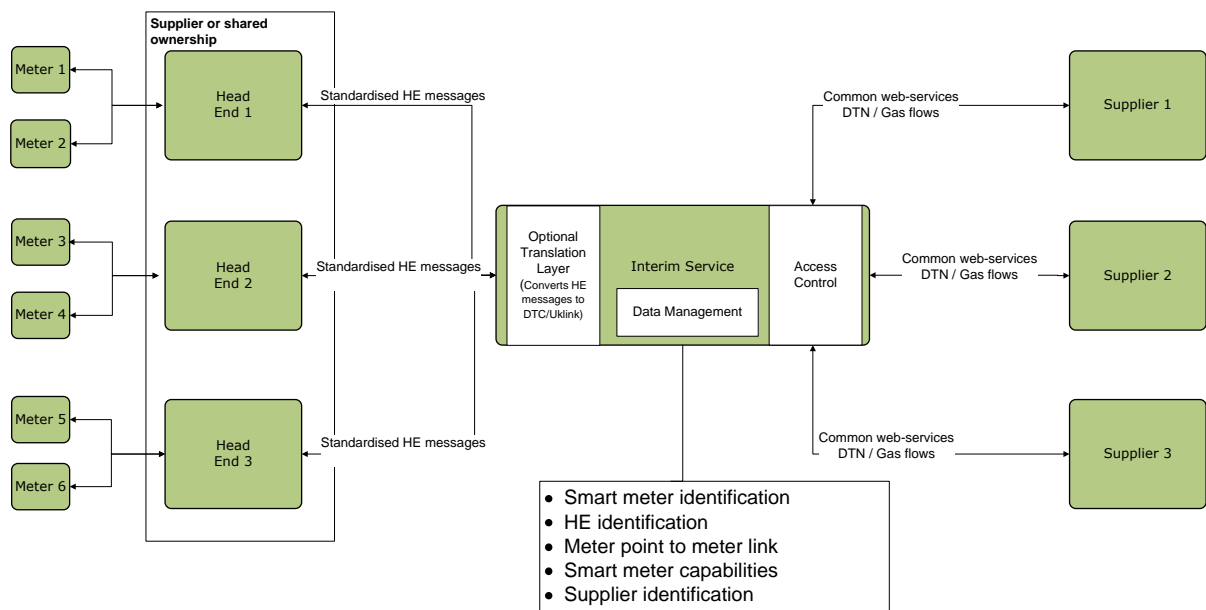


Figure 2: Standardise Head End Services

SWOT

Strengths

- Reduced development effort and costs for interim service providers as meter manufacturers standardise head end services. Only need to support one set of HE services
- Single interface for suppliers will enable communication with all smart meters – reduces Supplier development effort
- Single point of access to all smart meters, ensures only authorised parties can communicate with meters- No exchange of access details at CoS
- Allows suppliers to use existing communications infrastructure
- Allows suppliers to use existing dataflow infrastructure
- Provides option to use web-services to enable full functionality
- Converts messages into required format for meters/suppliers – no requirement for suppliers to build/procure their own translation services
- Single repository for all smart meter data provides opportunity for suppliers to be able to identify presence of smart meter prior to taking over supply point
- Will support key processes required by Suppliers
- Facilitates interoperability at CoS without changes to the meter hardware (meter, SIM card, etc);
- No dependency on other Suppliers

Weaknesses

- Dependency on meter manufacturers to work together and develop standard head end services in unison within short time-scale.
- Uses unproven head end technology and capabilities
- Changes required to use and/or structure of existing flows and or web services need to be created to support even basic smart functionality for Suppliers – meter configuration, provision of pricing information etc. Over and above that provided by initial deployments
- Multiple head end ownership will require complex commercial and support agreements- definition of these will potentially add to time required to implement central service
- Migration activity required prior to establishment of central service – in order to populate meter and comms data
- Compliance/accreditation testing required to allow central service to use DTN/UKLink etc. if not already an accredited body – potentially adds to implementation time
- Potential for extended implementation time- tender process for provision of central services, creation of central systems, look-ups to registration systems, full end-to-end testing required for all participants
- Does not allow suppliers to use existing head-end systems - Suppliers must migrate to interim service
- Comms contracts would need to be transferred from suppliers/service providers to central service - dependent on ownership

Opportunities

- Allows industry to test/hone operations using central service provider for smart meters
- Single source of data held in standard form available for transition to DCC
- Potentially allows for some premise alignment and improvement in data quality prior to creation of DCC
- Opportunity for the Interim Service to include a translation layer, to translate Head-End messages into standard DTC / UK Link data flows;
- Opportunity for the Interim Service to forward information/messages to Distribution operators or third parties in a standard format (e.g. Supply Outages, Alarms, Tamper alerts)
- Provides opportunity to establish end-to-end security standards for smart meters
- Provides opportunity to implement data privacy standards, all smart meter data and access to it obtained/held in single source
- Standardisation of registration look-up could be used by initial DCC -existing systems (e.g. ECOES, SGOES) could be used with changes to identify smart meters
- Suppliers can choose the services they wish to support

Threats

- Could be regarded as de facto DCC and no further industry development takes place
- May provide owner of central service with competitive advantage in DCC tendering process
- Distributed ownership of head ends makes establishment of data privacy and end-to-end security standards difficult to establish
- New services/processes would need to be defined to allow suppliers to fulfil mandated interim obligations
- May need to be run in parallel with DCC if central service supports non-technically compliant smart meters and also any non-domestic meters supported by service and suppliers elect not to use DCC
- Support for prepayment unclear – Prepayment solution requires specific supplier, payment network, head end and meter functionality. The use of different head-end systems may complicate (or even prevent) the implementation of a standard industry solution;

Option 3 - Single Head End with Common Services

Description

A universal head end is used by the interim service to communicate with all smart meters.

Suppliers perform their own rollouts of Smart Meters and WAN Communications Devices.

A separate, central system (Interim Service) provides access to:

- Smart Metered Supply Points
- Supplier registration details
- Comms providers (per Supply Point)
- Meter Ids
- Meter Capabilities

The interim service includes a lookup facility for this information, controls access to authorised parties, and directs information to the correct Head-End and Supplier.

The interim service translates standard Supplier requests into a universal head end protocol.

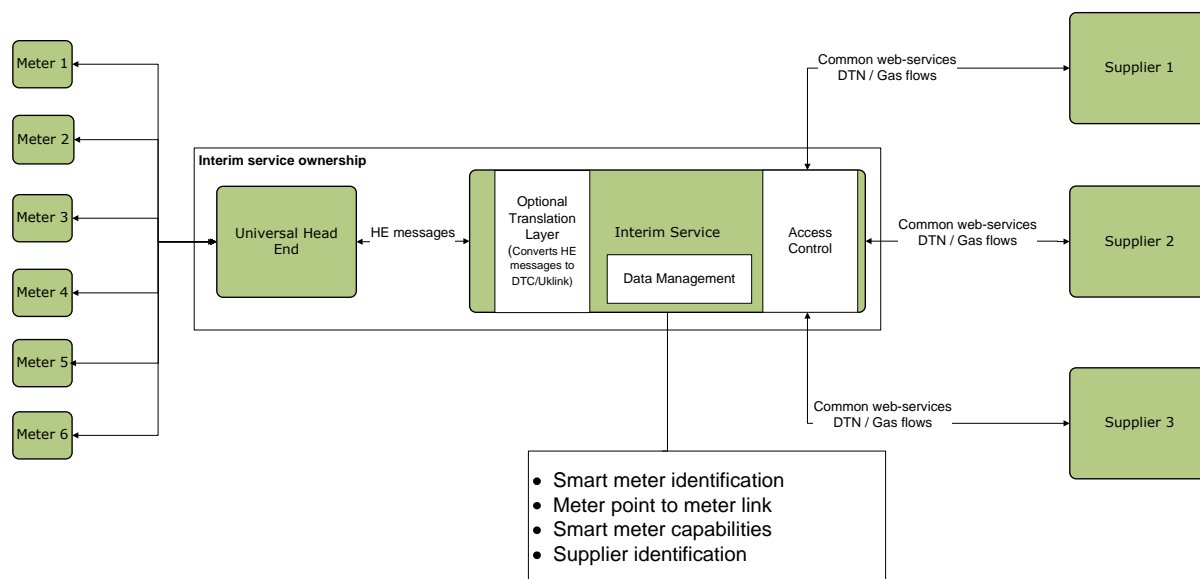


Figure 3: Single Head End with Common Services

SWOT

Strengths

- Single interface for suppliers will enable communication with all smart meters – reduces Supplier development effort
- Reduced development effort and costs for interim service providers as universal head end provides standardised interface to meters. Only need to support one set of HE services
- Universal head end provided by interim service simplifies commercial and support agreements
- Single point of access to all smart meters, ensures only authorised parties can communicate with meters- No exchange of access details at CoS
- Allows suppliers to use existing communications infrastructure
- Allows suppliers to use existing dataflow infrastructure
- Provides option to use web-services to enable full functionality
- Converts messages into required format for meters/suppliers – no requirement for suppliers to build/procure their own translation services
- Single repository for all smart meter data provides opportunity for suppliers to be able to identify presence of smart meter prior to taking over supply point
- Will support key processes with minimum change required by Suppliers to generate/send appropriate flows to central service
- Facilitates interoperability at CoS without changes to the meter hardware (meter, SIM card, etc);
- No dependency on other Suppliers

Weaknesses

- Uses unproven head end technology and capabilities – potential for increased development time.
- Changes required to use and/or structure of existing flows and or web services need to be created to support even basic smart functionality for Suppliers – meter configuration, provision of pricing information etc. Over and above that provided by initial deployments
- Migration activity required prior to establishment of central service – in order to populate meter and comms data
- Compliance/accreditation testing required to allow central service to use DTN/UKLink etc. if not already an accredited body – potentially adds to implementation time
- Potential for extended implementation time- tender process for provision of central services, creation of central systems, look-ups to registration systems, full end-to-end testing required for all participants
- Does not allow suppliers to use existing head-end systems - Suppliers must migrate to interim service
- Comms contracts would need to be transferred from suppliers/service providers to central service - dependent on ownership

Opportunities

- Allows industry to test/hone operations using central service provider for smart meters
- Single source of data held in standard form available for transition to DCC
- Potentially allows for some premise alignment and improvement in data quality prior to creation of DCC
- Opportunity for the Interim Service to include a translation layer, to translate Head-End messages into standard DTC / UK Link data flows;
- Opportunity for the Interim Service to forward information/messages to Distribution operators or third parties in a standard format (e.g. Supply Outages, Alarms, Tamper alerts)
- Simplifies establishment of end-to-end security standards for smart meters
- Provides opportunity to implement data privacy standards, all smart meter data and access to it obtained/held in single source
- Standardisation of registration look-up could be used by initial DCC - Existing systems (e.g. ECOES, SGOES) could be used with changes to identify smart meters
- Suppliers can choose the services they wish to support

Threats

- Dependency on single head end provider
- Single head end could limit network capacity/capability
- Time to add new meter protocols to single head end could delay rollout of new meter types
- New services/processes would need to be defined to allow suppliers to fulfil mandated interim obligations
- Could be regarded as de facto DCC and no further industry development takes place
- May provide owner of central service with competitive advantage in DCC tendering process
- May need to be run in parallel with DCC if central service supports non-technically compliant smart meters and also any non-domestic meters supported by service and suppliers elect not to use DCC
- Support for prepayment unclear – Prepayment solution requires specific supplier, payment network, head end and meter functionality. The use of different head-end systems may complicate (or even prevent) the implementation of a standard industry solution;

Option 4 - Customise Interfaces for each Head End

Description

Suppliers perform their own rollouts of Smart Meters and WAN Communications Devices.

Suppliers develop their own Head End translation services..

A separate, central system (Interim Service) provides access to:

- Smart Metered Supply Points
- Supplier registration details
- Head End provider
- Meter Id
- Meter Capabilities

This system provides a lookup facility for this information and limits access to the Smart Metering System to authorised parties.

The interim service provides access control services but does not provide translation services

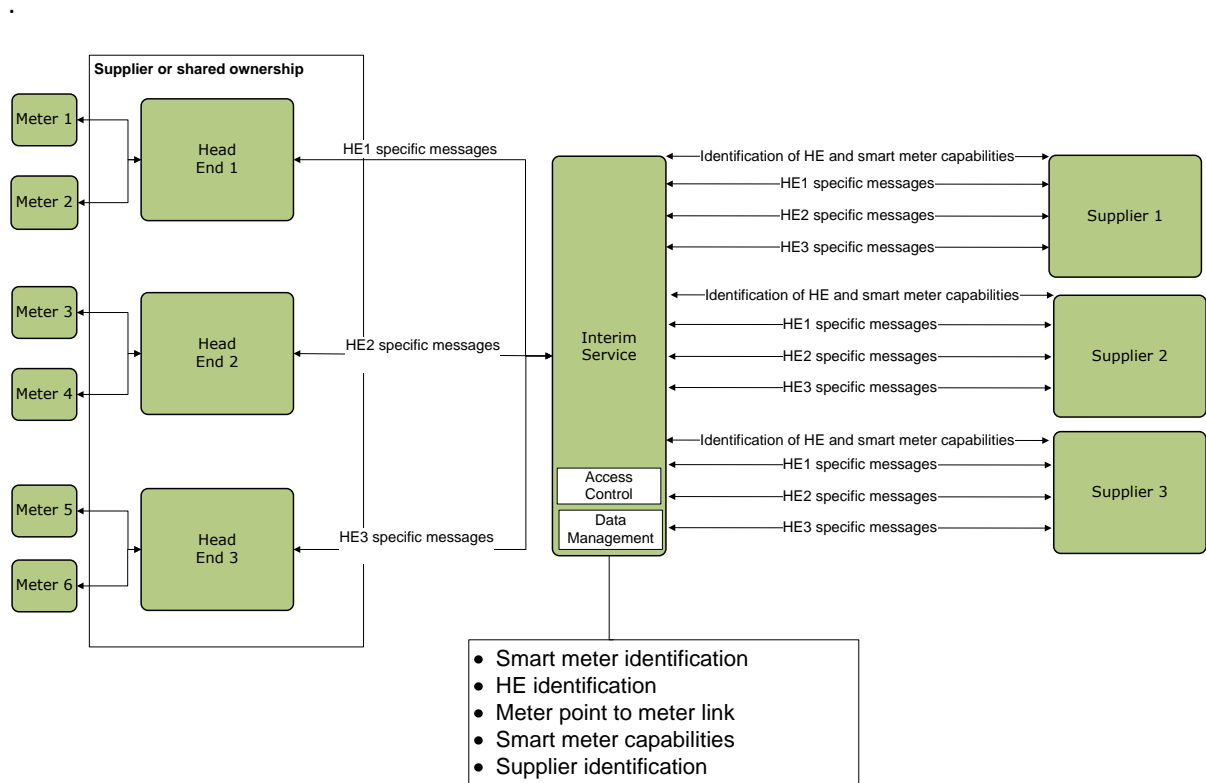


Figure 4: Customise Interfaces for each Head End

SWOT

Strengths

- Single point of access to all smart meters, ensures only authorised parties can communicate with meters- No exchange of access details at CoS
- May allow suppliers to use existing head-end protocols developed pre interim service
- Allows suppliers to use existing communications infrastructure
- Provides option to use web-services to enable full functionality
- Uses proven head end technology and capabilities
- Converts messages into required format for meters/suppliers – no requirement for suppliers to build/procure their own translation services
- Single repository for all smart meter data provides opportunity for suppliers to be able to identify presence of smart meter prior to taking over supply point
- Will support key processes with minimum change
- Facilitates interoperability at CoS without changes to the meter hardware (meter, SIM card, etc);
- No dependency on other Suppliers

Weaknesses

- Suppliers do not have a single defined interface for communicating with all Smart meters - this requires significant additional development effort
- New web services need to be created to support even basic smart functionality – meter configuration, provision of pricing information etc. Over and above that provided by initial deployments
- Multiple head end ownership will require complex commercial and support agreements- definition of these will potentially add to time required to implement central service
- Migration activity required prior to establishment of central service
- Potential for extended implementation time- tender process for provision of central services, creation of central systems, look-ups to registration systems, full end-to-end testing required for all participants
- Supplier development effort made redundant by DCC establishment
- Does not allow suppliers to use existing head-end systems - Suppliers must migrate to interim service
- Comms contracts would need to be transferred from suppliers/service providers to central service - dependent on ownership

Opportunities

- Single source of data held in standard form available for transition to DCC
- Potentially allows for some premise alignment and improvement in data quality prior to creation of DCC
- Standardisation of registration look-up could be used by initial DCC - Existing systems (e.g. ECOES, SGOES) could be used with changes to identify smart meters

- Suppliers can choose the services they wish to support

Threats

- Distributed ownership and multiple head end protocols makes establishment of data privacy and end-to-end security standards difficult to establish
- New services/processes would need to be defined to allow suppliers to fulfil mandated interim obligations
- May provide owner of central service with competitive advantage in DCC tendering process
- May need to be run in parallel with DCC if central service supports non-technically compliant smart meters and also any non-domestic meters supported by service and suppliers elect not to use DCC
- Support for prepayment unclear – Prepayment solution requires specific supplier, payment network, head end and meter functionality. The use of different head-end systems may complicate (or even prevent) the implementation of a standard industry solution;

Option 5 - Suppliers Provide Data Services

Description

Suppliers perform their own rollouts of Smart Meters and WAN Communications Devices.

The installing Supplier provides reads on request to the current Supplier. The responsibility for access control lies with the installing Supplier.

A separate, central system (Interim Service) provides access to:

- Smart Metered Supply Points
- Head End manager
- Meter Id

This system provides a lookup facility for this information and limits access to the Smart Metering data to authorised parties. The interim service may provide access to registration data.

This model is restricted to the provision of scheduled and on-demand reads.

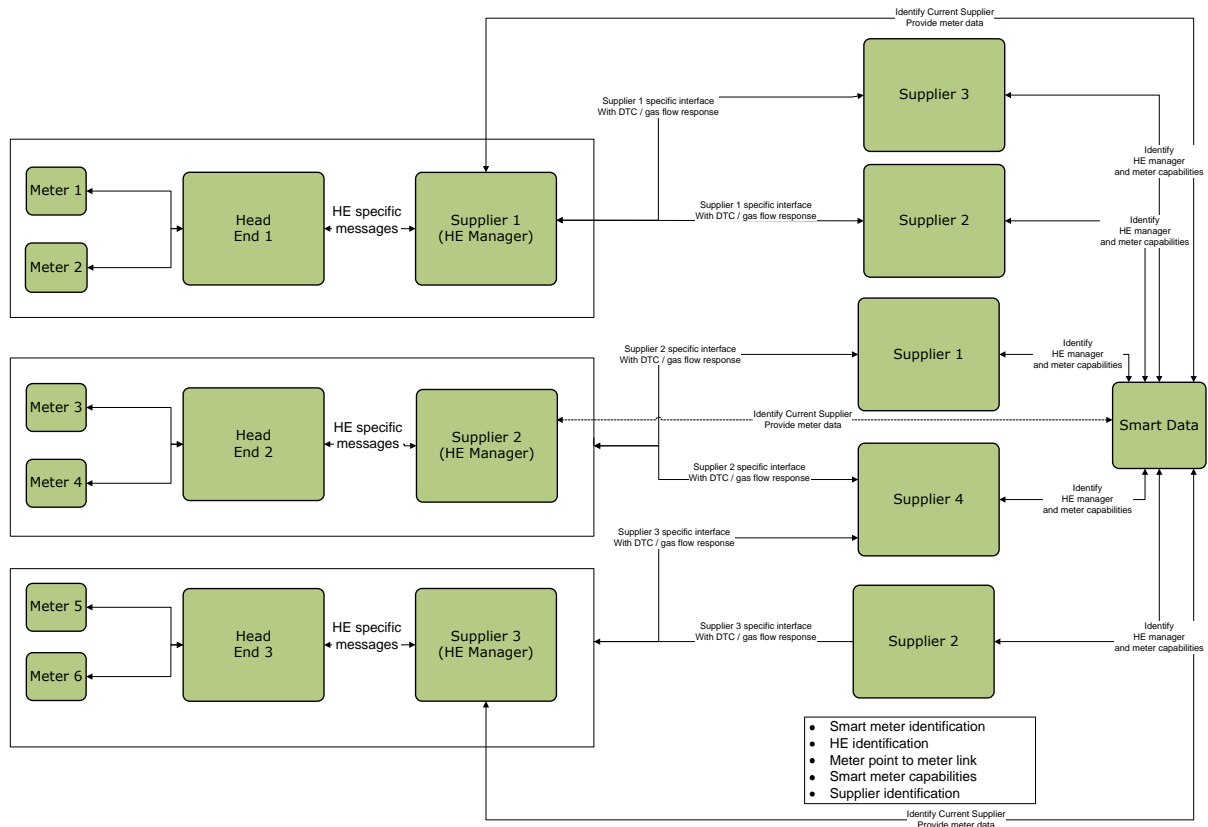


Figure 5: Suppliers Provide Data Services

SWOT

Strengths

- Allows suppliers to use existing communications infrastructure
- Allows suppliers to use existing dataflow infrastructure
- Uses proven head end technology and capabilities
- Converts messages into required format for meters/suppliers – no requirement for suppliers to build/procure their own translation services
- Single repository for some smart meter data provides opportunity for suppliers to be able to identify presence of smart meter prior to taking over supply point
- Facilitates very limited interoperability at CoS without changes to the meter hardware (meter, SIM card, etc);
- No translation services provided by interim service - limits central development effort
- Install process within control of Supplier – no dependency on interim service provider
- Interim service provides smart data repository only - limits central development effort

Weaknesses

- Only basic data provision (e.g. reads) continues seamlessly post CoS
- No support for meter configuration requests.
- Suppliers have to build multiple interfaces for different head ends
- Individual Suppliers provide access control – dependency on HE manager having access to registration data.
- Data held in the smart data repository does not provide basis for DCC transition.
- New interfaces required to smart data repository
- Supplier development effort made redundant by DCC establishment

Opportunities

- Standardisation of registration look-up could be used by initial DCC - Existing systems (e.g. ECOES, SGOES) could be used with changes to identify smart meters

Threats

- Restricted use of smart services/capabilities may result in negative consumer perception of smart metering
- Distributed ownership of head ends makes establishment of data privacy and end-to-end security standards difficult to establish
- May need to be run in parallel with DCC if central service supports non-technically compliant smart meters and also any non-domestic meters supported by service and suppliers elect not to use DCC
- No support for prepayment
- Access to a customer's meter provided only through competitor systems

- Suppliers may adopt inconsistent approach to access control
- Current Supplier dependent on competitor to ensure customer data privacy and security

Option 6 - Supplier Configures Meter/HE on CoS

Description

Suppliers perform their own rollouts of Smart Meters and WAN Communications Devices.

Suppliers make requests direct to the meter without going through the interim service. Comms and security details are made available to a gaining Supplier on Change of Supply. Suppliers use their own infrastructure and comms.

SIM cards may need to be exchanged following Change of Supply to enable the gaining Supplier to communicate with the meter.

Suppliers develop their own Head End translation services.

A separate, central system (Interim Service) provides access to :

- Smart Metered Supply Points
- Supplier (per Supply Point)
- Meter Id
- Meter Capabilities
- Meter Comms details
- Meter Access details (e.g keys/certificates)

This system provides a lookup facility for this information and limits access to the Smart Metering data to authorised parties.

The interim service provides access control services but does not provide translation services.

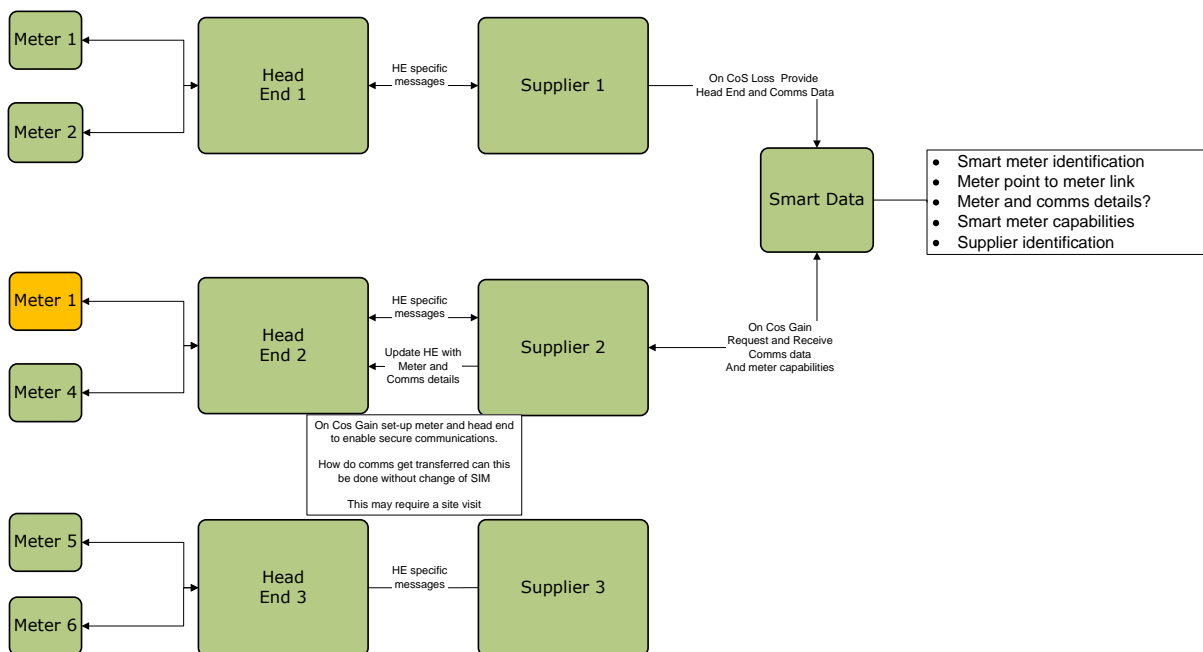


Figure 6: Supplier Configures Meter/HE on CoS

SWOT

Strengths

- Allows Suppliers to use their existing smart metering infrastructures
- Uses proven head end technology and capabilities
- Single repository for all smart meter data provides opportunity for suppliers to be able to identify presence of smart meter prior to taking over supply point
- No translation services provided by interim service - limits central development effort
- Install process within control of Supplier – no dependency on interim service provider
- Interim service provides smart data repository only - limits central development effort
- No dependency on other Supplier or interim service post CoS

Weaknesses

- Potentially need Site Visit Required to change SIM / configure meter – additional costs and poor customer experience.
- Suppliers do not have a single defined interface for communicating with all Smart meters - this requires additional development effort
- New interfaces required to smart data repository
- Dependency on Suppliers to update data repository
- Supplier development effort made redundant by DCC establishment
- Suppliers may have increased cost HE purchase/support
- Security keys/certificates needs to be passed between participants

Opportunities

- Standardisation of registration look-up could be used by initial DCC - Existing systems (e.g. ECOES, SGOES) could be used with changes to identify smart meters
- Suppliers can choose the services they wish to support
- Smart data captured in consistent form to provides basis for DCC transition

Threats

- Poor customer experience on CoS may impact mass rollout
- May need to be run in parallel with DCC if central service supports non-technically compliant smart meters and also any non-domestic meters supported by service and suppliers elect not to use DCC
- PPM solution developed independently by each Supplier
- No co-ordinated approach to security or data privacy
- New services/processes would need to be defined to allow suppliers to fulfil mandated interim obligations

Governance Arrangements Summary

This section provides an initial summary of ScottishPower's view on the Governance Arrangements discussed during the SG2 initial meeting. They provide a brief point of view which is to be developed further on how such arrangements could be implemented in the necessary timescales to support an interim solution.

Licence

For licensed entities operating in the gas and electricity sectors, it is clear that licence obligations are probably the principal concern outside of safety matters. Making use of relevant licences for this purpose may, therefore, be superficially appealing: licence changes could be drafted quite quickly; it also would put the ball back in the regulator's court, taking some of the pressure off industry to frame the solution.

Licence conditions, though, do not provide details of funding arrangements and the idea also raises questions about who would administer the arrangements at an operational level. Leaving it at a licence level would also be confusing, as the solution would require significant input from unlicensed parties, who would not then be bound to comply. It would also require that quite different, though closely related, conditions be drafted for the disparate licences and for each sector.

Ultimately, it would still be up to the industry to implement the changes, therefore a new licence condition(s) would still need to deliver the changes through the existing codes, as licences are never drafted at a sufficient level of detail to have direct effect. The solution will also require a change control process to manage any refinements that come forward over time. There is no precedent for this with licences and it is probably not something Ofgem would consent to.

Consequent code changes might need to be managed via the Significant Code Review route. This may not be practical and will, in all probability take too long to deliver, given that the changes still need to be managed through the individual change control processes of the disparate codes – Ofgem suggests an 18 month period to delivery of an SCR.

While it is certainly true that a solution using the licence would offer a means of binding the parties, adding more regulation to the market is not usually welcome.

Code Changes

As explained above, this will probably be necessary anyway. It may also be possible to use existing code administrators to help define the model through the Code Administrators Working Group (CAWG) and draft the changes. However, once drafted, the changes would need to be brought forward by code parties to be formally raised through the various individual code change processes.

Existing codes are much more of a known quantity, so it should be easier to identify where the changes will fit in. Also, if the existing communications framework is to be used, then it may make sense to rely on codes that are already integral to that framework.

Another advantage is the existing code governance structure, which means these changes can be raised without needing to refer back to DECC/Ofgem.

On the downside, none of the existing codes are pan industry. This will fragment the governance for the interim solution making it very difficult to administer and control. Another feature of this fragmentation is the ease with which the delivery of the necessary changes could be easily frustrated by those gain advantage. The vested interests of code administrators could also lead to sub-optimisation. There will also remain a question as to how the changes will be managed operationally, given the fragmentation of the governance.

Another major issue will be funding the changes, as some of the stakeholders may, legitimately, claim no interest in smart metering – e.g. generators. While we could argue about holistic benefits (etc. etc) this could drag on for a long time.

Finally, who would administer? It would be nigh on impossible to do so through one secretariat. Although the CAWG could be used for this purpose, it would not be without considerable logistical difficulty and, as the CAWG is not universal, it could lead to an unseemly bun fight and cause rifts that are damaging to *business-as-usual*.

Multiparty Framework Agreement

Could be delivered through a new SLC that mandates licensees become signatories and could easily be applied in pan industry fashion. It would also provide a legal basis for the solution, as the agreement will be contractually binding on its signatories. It may be possible to draft this as a Smart Energy Code (SEC) Framework Agreement i.e. by incorporating a sunset clause for the interim solution it might allow seamless transition to the enduring solution.

Of course, a significant drawback is that framework agreements are just that – i.e. frameworks – and do not generally delineate responsibilities' whereas, this agreement will need to be quite specific with regard to roles and responsibilities. A way to address this, and aid future development, may be to insert an interim solution section in the SEC, complete with a sunset clause, which can then also detail the transition to the enduring arrangements.

Big problems for this idea are a) the use of existing data flows etc. that are already governed elsewhere b) no single administrator and c) arrangements entirely dependent on Ofgem.

Memorandum of Understanding

Although very similar to a framework agreement, a memo of understanding might be thought lack legal muscle. However, this depends largely on how it is drafted i.e. if drafted with due consideration to mutuality, it may well be legally enforceable. Nonetheless, while this attracts all the drawbacks of the framework, it does not offer the utility of application to the SEC.

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